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ABOUT JOURNAL

Aim and scope

Annales Medicinae Urgentis (AMU) is a open-access peer reviewed medical journal published by the Croatian Society for Emergency Medicine that aims to improve the care of patients with emergency and critical illness by acquiring, discussing, distributing, and promoting evidence-based information relevant to emergency physicians and intensivists.

It publishes original original articles, reviews, case reports, meta-analysis, comments, methodologies, perspectives/ viewpoints, editorials, images, news, communications, letters to the editor, etc with no restrictions on the maximum length of manuscripts, provided that the text is concise and comprehensive. The AMU uses the Diamond Open Access model. This means that there are NO author processing fees and no fees to access the published papers.

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CMA - CROATIAN SOCIETY OF EMERGENCY MEDICINE

CONTENT

Editorial

Prof.
Višnja Nesek Adam,
MD, PhD

Dear colleagues, dear friends

We are pleased to present the 3rd Supplement, which contains the abstracts of lectures from the 8th Croatian Congress of Emergency Medicine with International Participation and the 7th South-Eastern European Emergency and Disaster Medicine Congress (SEEDMC), held together as a single joint event in Opatija from May 6th to 9th, 2025.

In the dynamic and ever-evolving field of emergency and disaster medicine, continuous education, exchange of knowledge, and multidisciplinary collaboration are essential for improving patient outcomes and strengthening healthcare systems. These congresses brought together a diverse group of experts, clinicians, and researchers, creating a unique platform for sharing experiences, presenting new research findings, and discussing the challenges we face in everyday clinical practice.

This supplement reflects the breadth and depth of topics addressed during the congress, encompassing a wide range of clinical scenarios, innovative diagnostic and therapeutic approaches, as well as organizational and system-level perspectives in emergency and disaster medicine. Through these abstracts, readers are offered insight into both common and rare clinical situations, highlighting the complexity of decision-making in time-critical environments.

Particular emphasis is placed on case-based learning, practical approaches, and real-world experiences, which remain fundamental to the advancement of emergency medicine. The contributions included in this supplement demonstrate not only scientific rigor but also the adaptability, critical thinking, and dedication required in our profession.

The joint organization of these two congresses provided an opportunity to strengthen regional and international cooperation, fostering dialogue and the exchange of ideas across different healthcare systems and professional backgrounds. The event was endorsed by the European Society for Emergency Medicine, underscoring its scientific importance and international recognition.

We believe that this supplement will serve as a valuable resource for all professionals involved in emergency and disaster medicine, offering knowledge that can be directly applied in clinical practice, as well as inspiration for further research and professional development.

We sincerely hope that you will find this collection of abstracts both informative and stimulating, and that it will contribute to the continued advancement of our field.

Sincerely,

Prof. prim. dr. sc. Višnja Nesek Adam, dr. med

SUCCESSFUL NON-OPERATIVE MANAGEMENT OF BOERHAAVE SYNDROME PRESENTING WITH THE CLASSIC MACKLER'S TRIAD: A CASE REPORT

***Ahmet Celal Özsoy**[1]

Abstract

Boerhaave syndrome (BS) is a rare but life-threatening spontaneous esophageal perforation caused by a sudden increase in intra-esophageal pressure, typically following forceful vomiting. With mortality rates ranging from 30 % to 50 %, BS poses a significant diagnostic challenge due to its non-specific clinical presentation. Although Mackler's triad, vomiting, chest pain, and subcutaneous emphysema, is considered pathognomonic, it is evidenced in only 14-15% of cases.

Case report

A 59-year-old female presented to the emergency department with sudden-onset vomiting, neck swelling, dyspnea, and retrosternal chest pain. Physical examination revealed cervical subcutaneous emphysema and diminished breath sounds on the left. Laboratory findings indicated a severe inflammatory response (C-reactive protein: 500 mg/L, white blood cell: $15x10^3$/mcL, procalcitonin: 3.18 ng/mL). Contrast-enhanced Thorax CT confirmed the diagnosis, showing a distal esophageal perforation, extensive pneumomediastinum, and pneumothorax. Despite the clinical severity, the patient remained hemodynamically stable. Based on the patient's stability and a favorable Pittsburgh Score, a multidisciplinary team opted for non-operative management (NOM). Treatment included tube thoracostomy for pneumothorax drainage, broad-spectrum intravenous antibiotics, and fasting. After one week of conservative therapy, the esophageal defect stabilized. Enteral nutrition was successfully initiated on the seventh day, and the patient was discharged in stable condition following the resolution of symptoms and inflammatory markers

Conclusion

BS remains a critical entity where delayed treatment can be fatal. While surgical intervention is traditional, this case underscores that NOM is a safe and effective strategy for hemodynamically stable patients with contained perforations and early presentation. The utilization of objective tools like the Pittsburgh Score is paramount in selecting appropriate candidates for conservative management.

Keywords: Boerhaave syndrome; Mackler's triad; non-operative

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VIPERA AMMODYTES BITE IN A RURAL AREA OF DALMATIA: THE ROLE OF HELICOPTER EMERGENCY MEDICAL SERVICE

***Zdravka Majić[1], Goran Karna[2]**

Abstract

Venomous snakebites represent a medical emergency and a serious clinical challenge due to the potential for severe local and systemic envenomation. In Europe and Croatia, venomous snakebites are relatively rare; however, they may lead to the rapid development of severe systemic envenomation and life-threatening conditions. In Croatia nose-horned viper (Vipera ammodytes) is most commonly associated with human bites. These cases require timely recognition of clinical severity and prompt emergency management.

Case report

A 66-year-old man was admitted to the emergency department after being bitten by a nose-horned viper on his right foot while working in his garden. Shortly after the bite, he developed local swelling, profuse sweating, vomiting, general weakness, and fatigue. Following initial management by his family physician and a ground-based emergency medical team, the Helicopter Emergency Medical Service (HEMS) was activated due to deterioration of his general condition, in order to provide further care and urgent transport to the University Hospital Center Split. Upon arrival of the HEMS team, the patient was hypotensive, tachycardic, pale, prostrated, adynamic, and in a state of shock. During transport, his condition further deteriorated, with transient loss of consciousness, persistent hypotension, vomiting, and abdominal cramps. Limb immobilization, fluid resuscitation, and symptomatic therapy were initiated, and antivenom serum was administered with adrenaline. At handover to the ground emergency medical team, the patient reported subjective improvement, with persistent nausea and hypotension, and was admitted to the emergency infectious disease department of University Hospital Center Split for further treatment and monitoring.

Conclusion

A nose-horned viper bite requires prompt assessment of envenomation severity and early hospitalization. This case report highlights the potential for rapid development of severe systemic envenomation following a viper bite, with progression to shock and altered consciousness. Effective prehospital care, including HEMS, are crucial for a favorable outcome.

Keywords: antivenom serum; HEMS; nose-horned viper

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WHAT LIES BEHIND DYSPNEA?

***Sara Schubert[1], Martina Pavletić[2], Mirjana Maras[2]**

Abstract

Dyspnea is a subjective sensation of shortness of breath or difficult breathing that occurs when there is an imbalance between the body's need for oxygen and the cardiorespiratory system's ability to meet that need. It is most commonly associated with respiratory and cardiovascular diseases, but may also be the first manifestation of severe metabolic or systemic disorder.

Case report

A 71-year-old male presented to the Emergency Department with dyspnea and general weakness, preceded by a month of fatigue, nausea, abdominal cramps, loss of appetite, weight loss, constipation, and new-onset voiding difficulties. His past medical history included arterial hypertension and hemorrhoids. On examination, he was tachypneic at rest with bilaterally diminished breath sounds and right-sided basal crackles, and a firm, tender lower abdomen suggestive of bladder retention. Bed side ultrasound showed bilateral hydronephrosis, urinary retention with a large intravesical clot, and suspicion of a bladder tumor. A urinary catheter was inserted as the initial intervention. Laboratory findings revealed moderate anemia, leukocytosis, severe acute kidney failure (urea 66,9 mmol/L, creatinine 3164 µmol/L) with severe hyperkalemia (7,3 mmol/L) and metabolic acidosis. The patient was resuscitated and treated for hypekalemia, with initiation of diuresis and a steady fall in potassium levels and accompanied by correction of metabolic acidosis. Emergent dialysis was not indicated, and the patient was admitted to the Urology Department with potassioum at the upper limit of normal. During hospitalisation, additional imaging revealed multiple papillary lesions in the urethra and around the bladder neck as the cause for obstructive nephropathy.

Conclusion

This case illustrates that dyspnea may primarily reflect profound metabolic acidosis due to acute obstructive nephropathy with kidney failure rather than primary respiratory or cardiac pathology. It highlights the importance of considering renal failure and metabolic acidosis in the differential diagnosis of dyspnea, especially in patients with nonspecific systemic symptoms.

Keywords: acute kidney injury; dyspnea; nephropathy

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NEW-ONSET VERTIGO AS THE INITIAL PRESENTATION OF A CEREBRAL VENOUS ANGIOMA: A CASE REPORT

***Karolina Beg[1], Kristina Bukovac[1], Ana Katić[2], Aleksandar Egić[1], Ervin Jančić[1]**

Abstract

Developmental venous anomalies are the most common cerebral vascular anomalies and are usually asymptomatic; however, they can also be symptomatic, causing headaches, focal neurological deficits, seizures, and may result in infarction.

Case report

A 55-year-old male patient with a medical history of arterial hypertension presented at the Emergency Department of General Hospital Karlovac with new-onset vertigo, dizziness, vomiting, and chest pain. The patient started to experience vertigo and chest pain early in the morning after waking up, and the vertigo was exacerbated by head movement and changes in position. In the physical examination, the patient's gait was unstable. Blood pressure was 150/100 mmHg, with no ECG changes and with cardiac biomarker levels within the normal range. A computed tomography (CT) scan of the brain was performed, which showed no ischemic, hemorrhagic, or tumor lesions. However, the CT scan of the brain revealed, on the left occipital side, a hyperdense ribbon-shaped formation resembling a blood vessel, most probably a vein, that extended transversely through the brain parenchyma from the lateral ventricle to the subdural area. This finding was confirmed by magnetic resonance imaging (MRI) of the brain, suggesting that it is a venous angioma without signs of compromised venous intracranial drainage. Additionally, the brain MRI also detected a 7 mm high-signal nodular lesion with morphological characteristics of vascular etiology, located near the occipital horn of the left lateral ventricle. In the Emergency Department, patient was given antiemetics and diazepam. Auditory Evoked Potentials findings revealed bilateral neuronal lesions of the auditory pathways. During hospitalization in the Neurology Department, treatment included antihypertensive, gastroprotective and other symptomatic therapy, and the patient was discharged in stable condition.

Conclusion

The occurrence of patients presenting with vertigo at the Emergency Department is quite common, and with various differential diagnoses of vertigo, a holistic approach to the patient is extremely important.

Keywords: chest pain; vertigo; vomiting

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NOT JUST BACK PAIN - A CAUDA EQUINA EMERGENCY

***Petra Terzić[1], Ivana Srzić[1], Josip Lipovac[1], Ivan Raguž[1], Adrijan Tiku[2]**

Abstract

Cauda equina syndrome is a rare neurological emergency caused by compression of the lumbosacral nerve roots. Common etiologies include large lumbar disc herniation, spinal stenosis, trauma or malignancy. It presents with gradual onset of perineal anaesthesia and bladder dysfunction, predominantly urinary retention with or without overflow urinary incontinence. Clinical suspicion and emergent MRI are crucial for appropriate management.

Case report

A 74-year-old male presents to the emergency department with lower back pain and bilateral lower leg paresthesias. He reported a sensation of bladder fullness and experienced involuntary urine leakage on three occasions since this morning. He denied any recent trauma. Neurological examination revealed lower limb hyporeflexia, moderate bilateral knee extension weakness (Medical Research Council, MRC 4/5), and paraesthesia in the L4 dermatome. An emergent of magnetic resonance imaging (MRI) of the lumbosacral spine (LS) was performed.

Imaging demonstrated intervertebral disc bulging with a left-sided foraminal protrusion at the L2/L3 level, resulting in significant narrowing of the left neural foramen and the left half of the spinal canal, with consequent compression of the cauda equina nerve roots within the dural sac. Neurosurgery was immediately consulted, and transfer to a centre capable of neurosurgical treatment was indicated. However, after the neurosurgical case conference, it was decided that emergent surgery was not necessary. Conservative treatment was continued, and afterwards the patient was sent to a rehabilitation centre. Surgery was performed later, however, urinary incontinence persisted.

Conclusion

Cauda equina syndrome is a serious neurological emergency where early recognition and timely management are essential to optimising outcomes. This case highlights the importance of comprehensive clinical examination and detailed history. Despite prompt clinical suspicion and emergent MRI confirmation of cauda equina compression, the delay in surgical decompression resulted with persistent urinary dysfunction. The outcome underscores the importance of early neurosurgical intervention, as delays in treatment are associated with irreversible neurological deficits.

Keywords: cauda equina syndrome; urinary incontinence

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OMISSIONS AND ERRORS IN THE MANAGEMENT OF EMERGENCY MENTAL CONDITIONS IN EMERGENCY CARE

***Desislava Katelieva[1]**

Abstract

I found during research for my monograph "Management of Emergency Mental Conditions", that emergency teams make a number of omissions and mistakes in all phases of the management of patients with mental symptoms. Aim A patient with mental symptoms and syndromes has a high risk of aggression towards others and aggression towards oneself and does not always need only psychiatric help. Mental symptoms and syndromes are manifestations of both mental illnesses and intoxications with psychoactive substances, diseases of the nervous system, various types of somatic diseases, traumatic brain injuries, various types of dysmetabolic states etc.

Methods

Literature review, personal experience, survey.

Results

The study proves that the features of mental states are not known, which leads to errors in the triage of emergency mental states over the phone and at the entrance to the emergency department, in assessing the risk of aggression and self-aggression, in the safety of the environment and the patient, in the assessment of vital indicators, in taking anamnesis and physical, neurological and mental status; in making decisions about whether to leave the patient at home or where to hospitalize. The consequences of these mistakes delay the life-saving treatment of these patients. The study found that the regulatory framework and the rights of the mental patient are not known, which leads to errors: in communication with these patients, in verbal, physical or medication de-escalation of aggressive behavior, in making a decision for hospitalization.

Conclusion

Patients with emergency mental conditions are diagnosed and treated by emergency medics with different levels of competence in outpatient and in hospital conditions. The study proves the need to develop protocols for the assessment of the emergency psychiatric patient by a working group of medics with different specialties and lawyers. They will protect both emergency medics and their patients from mistakes and omissions.

Keywords: agressive behavior; management; mental conditions

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OPERATIONAL REVIEW OF MEDICAL SUPPORT FOR A MASS GATHERING EVENT HELD IN ZAGREB

***Adis Keranović[1], Alan Kvarantan[1], Branka Bardak[2]**

Abstract

This review presents the operational organization of medical support established for the MPT Concert held in Zagreb on July 5, 2025, which was attended by approximately 500,000 people. We detail the extensive pre-event planning required, emphasizing the multi-agency collaboration between state and city services, as well as the establishment of a unified command and control architecture.

Case report

The medical support strategy was executed through a three-tiered system. The first level comprised mobile and fixed Emergency Medical Services (EMS) teams deployed directly within the concert venue and fan zones to provide immediate on-site care. The second level featured a stationary Emergency Medical Intervention Center, which functioned as a forward treatment unit and a crucial triage filter to prevent overcrowding at local facilities. The third level involved the coordinated network of City of Zagreb hospitals and regional hospitals around Zagreb for definitive care.

Conclusion

This presentation analyzes the specific challenges, equipment requirements, and logistical constraints faced at each level. The review concludes with critical lessons learned regarding patient flow and resource management to improve standards for future mass gathering medical support

Keywords: EMS; mass gathering medicine; planning

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OUR EXPERIENCE IN THE FIRST YEAR OF PARTICIPATION IN THE ANGELS INITIATIVE

***Ivana Grubešić[1]**

Abstract

Emergency Medical Services play a crucial role in the early recognition and management of patients with acute stroke. Wanting to improve the management of patients with acute stroke, Institute of Emergency Medicine of Primorje-Gorski Kotar Country has joined The Angels Initiative in 2025, a world healthcare Initiative that helps emergency medical services and hospitals around the world at improving the quality of stroke care through the standardization of procedures, staff education, and monitoring of quality indicators via the RES-Q registry. Our goal is to present our performance results during 2025. In order to achieve Diamond Award we had to fulfill Angels Initiative participation criteria. During 2025, we collected raw data for a total of 355 patients with clinical suspicion of stroke. In all four quarters, the EMS achieved the EMS Angels Diamond Award. The number of patients ranged from 62 to 138 per quarter, with the highest number recorded in Q1 (138 patients). The median time on scene varied between 13 and 18 minutes, with the shortest time recorded in Q3 (13 minutes). Key quality indicators were consistently very high throughout the year. In Q2, Q3, and Q4, performance reached 100 % for "patient last known normal" documentation, medication detail reporting, prenotification to hospital, and stroke-ready hospital transport. In Q1, results were slightly lower but still excellent, ranging from 95.7 % to 96.4 %, with 100 % of patients transported to a stroke-ready hospital.

Conclusion

In conclusion, we can proudly say that, as the first Institute of emergency medicine in Croatia that joined the Angels Initiative, we continuously work on staff education, protocol improvement, and strong collaboration with University Hospital Centre Rijeka in order to enhance prehospital care for stroke patients. All that reflected in the results achieved during our participation in the Angels Initiative over the past year.

Keywords: Angels Initiative; prehospital care; stroke

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PANCREATIC CONTUSION FOLLOWING BLUNT ABDOMINAL TRAUMA: A CASE REPORT

***Marija Roksandić[1], Martina Pavletić[2], Ana Mišković[2]**

Abstract

Pancreatic injury is an uncommon consequence of blunt abdominal trauma, reported in less than 2% of such cases. Its retroperitoneal position often masks early clinical and radiological signs, leading to delayed recognition. High clinical suspicion and early imaging evaluation are therefore crucial for timely diagnosis and appropriate management.

Case report

A 31-year-old man presented to the emergency department with progressive abdominal pain developing over 48 hours after a fall and blunt impact against a chair. He had not eaten since the incident and denied nausea or vomiting. On examination, the abdomen was tense, rigid, and diffusely tender on palpation. Laboratory tests showed mild leukocytosis with modestly elevated amylase and inflammatory markers. Focused Abdominal Sonography in Trauma (FAST) revealed a small perisplenic fluid collection, without signs of free intraperitoneal bleeding. The patient was hemodynamically stable and received analgesia. Contrast-enhanced computed tomography (CT) demonstrated retroperitoneal soft-tissue changes adjacent to the pancreas and left adrenal gland, with suspected hemorrhagic components, hypodensity in the pancreatic head and uncinate process, and minimal perisplenic and left paracolic free fluid. No parenchymal lacerations were visualized. Magnetic resonance imaging (MRI) confirmed focal arterial phase hypoperfusion of the pancreatic head with surrounding T2 hyperintensity extending toward the left adrenal and subphrenic spaces. The main pancreatic duct remained intact. Findings were consistent with pancreatic contusion and limited peripancreatic inflammatory collections. The patient was referred for surgical consultation and managed conservatively.

Conclusion

Pancreatic trauma, although rare, must be considered in patients presenting with persistent abdominal pain after blunt injury. Its subtle clinical course underscores the importance of imaging in patients to achieve early and accurate diagnosis, guide conservative management, and prevent complications.

Keywords: abdominal; blunt; injury; pancreatic; trauma

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PARAPARESIS IN A YOUNG MAN AFTER HAIR TRANSPLANTATION

***Monika Tokić[1], Jasmin Hamzić[1], Ivan Gornik[1]**

Abstract

Hypokalemia is an important and potentially reversible cause of acute muscle weakness that often presents with initial involvement of the lower limbs and may progress cranially to involve respiratory muscles. This case highlights the diagnostic challenges when atypical triggers mask hypokalemia—here, self-administered diuretics following a recent cosmetic procedure—and underscores the need for a systematic approach to acute flaccid weakness.

Case report

A 34-year-old man presented with lower extremity weakness without sensory loss and faecal or urinary incontinence. The symptoms weren't preceded by trauma, and the only thing that stood out from the anamnesis was the hair transplant he underwent 3 days earlier. The clinical status was characterised by paraparesis with a bilateral negative Babinski sign and preserved sensation. The ECG showed sinus tachycardia, ST depression in leads v4 - v6, T wave inversion in the precordial leads, and the presence of a U wave. Venous blood gas (VBG) revealed severe hypokalemia and hyperglycemia, which was subsequently confirmed by laboratory findings, along with leucocytosis, troponinemia, and mildly elevated alanine aminotransferase (ALT) and creatine kinase (CK) values. Toxicological screening suspected the presence of caffeine, lidocaine, nicotine, cotinine, and theobromine. MSCT of the brain showed no pathomorphological substrate. After placement of a urinary catheter, 1.500 mL of retained urine was collected. The patient subsequently admitted to taking an over-the-counter diuretic with the aim of dehydration for an upcoming fitness competition. After potassium and fluid replacement, the patient was able to move his lower extremities properly, and the ECG normalised. Since troponin levels continued to rise in follow-up laboratory tests, hospitalisation was recommended, but the patient declined.

Conclusion

Acute bilateral lowerlimb weakness demands prompt, structured evaluation with early measurement and correction of electrolytes, particularly potassium, and assessment for metabolic and cardiac complications. With timely potassium and fluid replacement, most patients recover fully, but close follow-up is warranted when complications are suspected.

Keywords: emergency department; electrolytes; hypokalemia; neurology; paraparesis

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PITUITARY APOPLEXY: ACUTE HYPOPITUITARISM – CASE REPORT

***Eric Kovačina[1], Karin Zibar Tomšić[2]**

Abstract

Pituitary apoplexy is a life-threatening neuroendocrine emergency requiring rapid diagnosis and treatment. It results from acute haemorrhage or infarction within the pituitary gland, typically occurring in a pre-existing adenoma. Clinical signs include a sudden headache, visual impairment, neurological deficits, and acute hormonal failure, specifically ACTH deficiency. Due to the risk of adrenal crisis and neurological complications, an urgent multidisciplinary approach is vital.

Case report

A 78-year-old female presented to the emergency department with nausea and vomiting lasting two days. Notably, her serum sodium was 130 mmol/L, she was initially diagnosed with gastroenteritis. Fourteen days later, she returned with presyncope and new-onset rapid atrial fibrillation. She reported five days of nausea and vomiting, a severe headache for the last two days described as "the worst of her life," and a fever of 38.4°C. Her vision was unaffected. A brain CT showed an enlarged sella turcica and a 21 mm suprasellar mass compressing the optic chiasm and indenting the third ventricle floor, suggesting a pituitary macroadenoma. Following a basal cortisol draw, 100 mg of IV hydrocortisone was given, along with empirical antibiotic therapy. During observation, her fever reached 40°C without a clear cause. Cortisol level of 60 nmol/L confirmed hypocorticism. Urgent pituitary MRI identified subacute pituitary haemorrhage, while further endocrine workup confirmed panhypopituitarism. It was concluded that a non-functional macroadenoma led to pituitary apoplexy and panhypopituitarism. The patient was discharged on replacement therapy with hydrocortisone and levothyroxine.

Conclusion

This case highlights the importance of timely recognition of neuroendocrine emergencies and hormonal replacement, primarily hydrocortisone therapy in the emergency department, to prevent potentially life-threatening complications, such as an adrenal crisis.

Keywords: adenoma; adrenal insufficiency; pituitary apoplexy

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POINT-OF-CARE ULTRASOUND FOR RAPID BEDSIDE IDENTIFICATION OF INFECTION SOURCE IN THE EMERGENCY DEPARTMENT: REPORT OF TWO CASES

***Ivana Klarić[1], Tanja Zovko[1], Ivana Ćavar[1], Mia Jurišić[1], Marina Berberović[1]**

Abstract

Severe infections in the emergency department are associated with high morbidity and mortality, particularly when the source of infection is not promptly identified. Delayed source control complicates targeted therapy and may lead to clinical deterioration and sepsis. Point-of-care ultrasound (POCUS) enables rapid bedside assessment and may facilitate early identification of the infection source during the initial evaluation.

Case report

We present two patients with elevated inflammatory markers and unclear clinical presentations in whom early POCUS guided diagnosis and management. A 75-year-old man presented with fever, tachycardia, and laboratory signs of systemic infection without a clear clinical focus. According to the Sepsis-3 definition, this patient had sepsis without shock. Due to suspected sepsis of unknown origin, bedside abdominal POCUS was performed within 20 minutes of arrival and revealed gallbladder enlargement, wall thickening, gallstone impaction at the gallbladder neck, and a positive sonographic Murphy sign, suggestive of acute gangrenous cholecystitis. Computed tomography confirmed the diagnosis, and urgent surgical intervention was performed. Histopathological examination confirmed gangrenous cholecystitis with gallbladder hydrops. An 80-year-old postoperative patient who had undergone osteosynthesis of a pertrochanteric femoral fracture ten days earlier presented with acute thigh swelling and elevated D-dimer levels, raising suspicion of deep vein thrombosis. POCUS excluded venous thrombosis and demonstrated findings consistent with soft tissue cellulitis, including interstitial edema and increased vascularity, avoiding unnecessary CT venography. Prompt antibiotic therapy led to clinical improvement.

Conclusion

POCUS represents a valuable adjunct in patients with suspected infection of unclear origin. Early problem-oriented ultrasound facilitates rapid source identification, supports timely and targeted management, and highlights the importance of structured POCUS training for emergency physicians.

Keywords: infection source; point-of-care; sepsis; ultrasound

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POLYPHARMACY IN THE EMERGENCY DEPARTMENT: WHEN TREATMENT BECOMES THE TRIGGER

***Eneida Hoxha[1], Ledio Collaku[1], Albana Kociaj[1], Matilda Kambo[1], Somida Kuka[1], Pandush Pojani[1], Xhesika Habilaj[1], Elvana Rista[2], Margarita Resuli Gjata[1]**

Abstract

Polypharmacy is increasingly prevalent among elderly and multimorbid patients presenting to the emergency department (ED). While often unavoidable, the concurrent use of multiple medications may act as a hidden trigger for acute clinical deterioration, leading to falls, delirium, acute kidney injury, electrolyte disturbances, hemodynamic instability, and unplanned hospital admissions. In the high-pressure ED setting, medication-related emergencies are frequently underrecognized, as presenting symptoms are often attributed to disease progression rather than adverse drug effects or clinically relevant drug interactions. To underscore polypharmacy as a clinically relevant and frequently overlooked precipitating factor of emergency presentations and to emphasize the role of early medication review as part of the initial clinical assessment in the Emergency Department.

Methods

This presentation is based on clinical experience supported by representative case scenarios of elderly patients presenting to the ED with acute symptoms such as syncope, confusion, hypotension, electrolyte imbalance, and acute kidney injury. Medication regimens were reviewed during routine clinical evaluation, with particular attention to potential drug–drug interactions, inappropriate prescriptions, and drug dosing in relation to renal function. Commonly implicated drug classes included antihypertensives, diuretics, antidiabetics, psychoactive agents, and renin–angiotensin–aldosterone system inhibitors.

Results

Polypharmacy was frequently identified as a relevant contributing factor to emergency presentations. In many cases, clinical deterioration was at least partially reversible following timely recognition of medication-related triggers and appropriate therapeutic adjustment. Delayed identification of polypharmacy in the ED was often associated with the need for hospital admission, prolonged clinical observation, and an increased risk of acute complications.

Conclusion

Polypharmacy should be regarded as an independent emergency risk factor rather than a Abstract clinical characteristic. Incorporating early, structured medication review into emergency clinical decision-making may reduce avoidable morbidity and support safer patient management. Increased awareness of medication-related emergencies is essential for optimizing acute care in increasingly complex patient populations.

Keywords: emergency; geriatrics; medication; polypharmacy; safety

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POLYTRAUMA AFTER A SUICIDE ATTEMPT: EMERGENCY APPROACH AND CLINICAL COURSE

***Hana Ćurtović[1], Antonio Šegota[1], Zdeslav Strika[1]**

Abstract

Polytrauma refers to a condition in which a patient sustains at least two severe injuries involving different anatomical regions or organ systems, with at least one injury posing as immediate threat to life.

Case report

A 54 year old man was found lying on the ground after jumping from a balcony. Heteroanamnesis revealed a history of alcohol abuse and PTSD. A suicide note was also found. On arrival, Glasgow coma score (GCS) was 5, he was breathing, central pulse was palpable, peripheral pulses were absent. Vital signs: RR 75/59mmHg, pulse 120/min, SpO_2 57 %. An open fracture of the right femur, dislocation of the left knee and an open head wound were noted. On auscultation bilateral breath sounds were present. EMT administered oxygen 15L/min, established intravenous access and initiated fluid resuscitation (500ml NaCl) with 1g tranexamic acid. Cervical spine immobilization with Schantz collar, hemorrhage control and immobilization in a vacuum matress were performed for urgent transport. Initial laboratory findings showed anemia with macrocytosis and stress leukocytosis. Anemia was corrected with four units of RBC. Endotracheal intubation and mechanical ventilation were initiated. Emergency CT revealed multiple midface fractured including the nasal bone, maxillary sinuses, left zygomatic arch with hemorrhagic content in the sinuses. Emergency radiographs showed bilateral multifragmental fractures of the distal femoral bones. The patient was transferred to the ICU where external fixation was performed. The next day, respiratory function recovered and the patient was extubated. He was conscious, breathing spontaneously and hemodynamically stable. The day after a sudden deterioration occurred, he was found unconscious and pulseless. Due to his severly compromised condition, resuscitation was not initiated.

Conclusion

This case confirms that polytrauma, despite initial stabilisation and timely therapeutic interventions, carries a risk of sudden and fatal detrioration. It highlights the importance of intensive monitoring and a structured approach in the managment of these patients.

Keywords: femoral fractures; multiple trauma; wounds

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POSTMORTEM GENETIC TESTING: ETHICAL, CULTURAL, AND FAMILIAL PERSPECTIVES ON DECISION-MAKING AFTER DEATH

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Abstract

Postmortem genetic testing raises distinctive ethical challenges due to the relational nature of genetic information and the absence of consent from the deceased. While such testing may clarify cause of death and identify heritable risks for surviving relatives, it also raises concerns regarding respect for the deceased, privacy, potential psychological harm, and the appropriate scope of disclosure. Existing bioethical analyses and professional guidelines rely largely on principles such as autonomy, beneficence, non-maleficence, and confidentiality, yet offer limited practical guidance in postmortem contexts where autonomy cannot be exercised and the primary beneficiaries are third parties. This review examines contemporary bioethical literature and professional genetic guidelines to identify normative gaps in current approaches to postmortem genetic testing. It further explores Jewish law as a complementary ethical framework addressing respect for the deceased (kavod hamet), restrictions on bodily interference, and the obligation to prevent harm and preserve life (pikuach nefesh). Jewish law is analyzed not as binding religious legislation, but as a structured ethical tradition that facilitates balancing competing moral obligations. Using a qualitative normative analysis, the study integrates bioethical reasoning, professional guidance, and insights from Jewish law to develop a structured ethical decision-making protocol for postmortem genetic testing. The proposed framework emphasizes clinical relevance, proportionality of benefits and harms, respect for the presumed wishes and dignity of the deceased, appropriate identification of decision-makers, and the role of genetic counseling in mediating disclosure to family members.

Conclusion

Postmortem genetic testing is an expanding yet ethically under-structured domain of medical practice. This review demonstrates the limitations of existing ethical frameworks and the value of integrating culturally grounded ethical traditions into contemporary bioethics. The proposed protocol offers clinicians and ethics committees a balanced and practical approach that safeguards dignity, minimizes harm, and responsibly addresses the medical interests of families.

Keywords: bioethics; genetic; jewish; postmortem; testing

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PREDICTORS OF PROFESSIONAL EXHAUSTION: A CROSS-SECTIONAL STUDY ON WORK ORGANISATION AND WORKPLACE VIOLENCE IN THE CROATIAN EMERGENCY MEDICAL SERVICE

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Abstract

This study aimed to identify the predictors of increased burnout levels among Croatian Emergency Medical Services (EMS) providers, its correlation with specific occupational stressors, including shift patterns, monthly overtime and the frequency of exposure to physical and verbal assaults.

Methods

A cross-sectional survey was conducted among 226 Croatian out-of-hospital EMS professionals. Burnout was assessed using the Maslach Burnout Inventory (MBI), which measures emotional exhaustion (EE), depersonalisation (DP), and personal accomplishment (PA) scores. Several determinants were collected in the previous 12 month period, including shift pattern (12–24–12–48 vs other), monthly overtime, and frequency of verbal/physical assaults. Group differences were tested using the Mann–Whitney U (binary) and the Kruskal–Wallis tests (≥3 groups) with Holm-adjusted post-hoc comparisons; $\alpha=0.05$ (two-sided).

Results

Mean MBI scores were EE 16.96±10.46, DP 14.32±10.48, and PA 31.35±9.65. A regular 12–24–12–48 shift was reported by 43.8% and was not associated with EE, DP, or PA (all $p>0.43$). DP differed significantly across overtime categories ($p=0.005$) and was higher among those working >20 h/month than 5–10 h/month (19.07±10.32 vs 12.04±10.53). Workplace violence was commonly reported: in 40.7 % it was physical, in 93.8 % verbal. Monthly verbal assaults were reported in 27.9 % of examiners. Verbal violence showed a strong dose–response relationship with burnout (EE $p=5.1\times10^{-6}$; DP $p=1.3\times10^{6}$), with higher EE (22.32±9.74) and DP (20.44±10.87) in those experiencing monthly assaults compared with those exposed few times per year (EE 16.00±10.08; DP 12.76±9.10). Physical violence was associated with higher EE ($p=0.03$).

Conclusion

Burnout levels in EMS are strongly driven by excessive workload and exposure to patient-related assaults. These findings accentuate the need for organisational changes, including implementation of safety protocols, improved availability of psychological support, and better management of working hours to preserve the mental health of frontline medical staff.

Keywords: emergency medical services; mental health; psychological burnout; workload; workplace violence

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PREHOSPITAL BLOOD TRANSFUSION: LUXURY OR NECESSITY IN THE CROATIAN HEMS SYSTEM?

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Abstract

Massive bleeding is the leading cause of death in trauma patients. In addition to being the main trigger of the lethal triad, it is also one of the preventable factors. In advanced emergency medicine systems with Helicopter Emergency Medical Service (HEMS) prehospital blood transfusions are a standard part of damage control resuscitation. In Croatia, the national HEMS system has been operational since April 30, 2024, while prehospital blood transfusion has not yet been implemented. Given the country's specific geography, including rural and island regions, and limited healthcare resources, it remains unclear whether prehospital transfusion represents a luxury or a clinical necessity. With our study we tried to assess whether there are clinical, logistical, and organizational conditions within the Croatian HEMS system that justify the implementation of prehospital blood transfusion.

Methods

We planned a retrospective analysis of missions conducted by the Rijeka HEMS base from the beginning of its operational period by analizing available data on patient demographics, mechanism of injury or acute medical condition, vital parameters during prehospital management, therapeutic interventions and transport times. Potential indication for transfusion will be based on a combination of clinical assessment of hemorrhagic shock and objective indicators of hemodynamic compromise (arterial hypotension, tachycardia, altered mental status, signs of hypoperfusion), predefined prior to analysis. In addition to estimating the proportion of potential candidates, operational parameters (transport duration, distance to tertiary care) and organizational prerequisites for implementation will be evaluated.

Results

This analysis provides an objective assessment if introducing prehospital blood transfusion in Croatian prehospital is justified and organizationally possible.

Conclusion

In the context of a newly established national HEMS system, decisions regarding implementation should be based on local data, actual patient needs, and long-term system sustainability.

Keywords: emergency medicine; HEMS; hemorrhagic shock

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PREHOSPITAL MANAGEMENT OF ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION FOLLOWING THE INTRODUCTION OF TELEMEDICINE: EXPERIENCE FROM BROD-POSAVINA COUNTY

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Abstract

This study aimed to evaluate the impact of telemedicine implementation on the timeliness and efficiency of prehospital management of patients with ST-segment elevation myocardial infarction (STEMI) in Brod-Posavina County. Specifically, we analyzed the frequency of physician or PCI center consultations during ECG interpretation and the scope of medical interventions performed during patient transport.

Methods

Study design is a retrospective descriptive study. Participants and Methods: The study included all patients with ST-segment elevation myocardial infarction (STEMI) treated by the Emergency Medical Service of Brod-Posavina County between 2020 and 2024. Data were obtained from the e-Hitna electronic medical record system and standardized chest pain monitoring forms.

Results

A total of 95 patients were included, of whom 67.4% were male. The most represented age group was 61–70 years. In 85 patients, chest pain duration was less than 12 hours. The majority of STEMI cases were managed by the Slavonski Brod EMS substation. The mean time from ECG acquisition to patient handover at the PCI center was 33 minutes. Cardiologist consultation was performed in 65.9% of cases. During transport, peripheral intravenous access was established in 96.8% of patients, 95.7% received acetylsalicylic acid, 78.1% received oxygen therapy, and 56.5% were administered nitroglycerin spray. Continuous patient monitoring was documented in 93.6% of cases. One female patient died during prehospital management.

Conclusion

The introduction of telemedicine substantially strengthened the organization and performance of prehospital STEMI care in Brod-Posavina County. It enabled rapid specialist consultation, shortened critical time intervals, and ensured high protocol adherence during patient transport. Importantly, by facilitating earlier diagnosis and timely activation of the PCI pathway, telemedicine has clear clinical relevance, as reducing treatment delays in STEMI is directly associated with improved myocardial salvage and better patient outcomes. These findings position telemedicine as a key system-level intervention enhancing both efficiency and clinical effectiveness of early STEMI management.

Keywords: emergency medical services; myocardial infarction

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PRIMARY INTERVENTION IN HEART ATTACK: THE IMPORTANCE OF HELICOPTER EMERGENCY MEDICAL SERVICE (HEMS)

***Marijana Bebek[1], Ivana Dumbović[2]**

Abstract

Acute myocardial infarction is one of the most common and serious medical emergencies, where the time from the onset of symptoms to the start of treatment plays a crucial role in the patient's outcome. Timely primary intervention is aimed at quick recognition of symptoms, early diagnosis, initiation of therapy and urgent transport of the patient to a health facility that enables percutaneous coronary intervention.

Case report

The primary intervention of the Helicopter Emergency Medical Service (HEMS) was carried out in a rural area of Sisak-Moslavina County in a situation when at that moment there were no available ground emergency medical service teams due to their busyness with other interventions. Thanks to the rapid activation and arrival of the helicopter team, the patient was treated in the shortest possible time and transported in a timely manner for further hospital treatment and percutaneous coronary intervention. This form of primary helicopter intervention significantly contributes to reducing the time to the start of treatment and potentially a better outcome for the patient.

Conclusion

In conclusion, this case report confirms the key role of timely and well-organized emergency medical care in the care of patients with acute myocardial infarction. In conditions of unavailability of ground teams, the primary intervention of the emergency helicopter medical service in the Sisak-Moslavina County area enabled rapid recognition of the condition, early therapeutic intervention and urgent transport to a facility with the possibility of percutaneous coronary intervention. This significantly shortened the time to reperfusion, which directly affects the reduction of complications and improvement of the clinical outcome of the patient. This case further emphasizes the importance of the availability and integration of the Helicopter Emergency Medical Service (HEMS) into the emergency medical care system, especially in rural and less accessible areas.

Keywords: helicopter; infarction; ischemia; transport

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PROCALCITONIN USE AND USEFULNESS IN EMERGENCY DEPARTMENT

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Abstract

Procalcitonin (PCT) is widely promoted as a biomarker for early detection of bacterial infection and sepsis and as a decision aid for antibiotic initiation in the emergency department (ED), but its real-life impact remains uncertain.

Methods

We performed a retrospective study on patients who had PCT measured in their evaluation ind the ED. Demographics, clinical and laboratory data, PCT values, indications for PCT testing, and antibiotic prescriptions were collected. Patients were stratified by PCT level and by indication for PCT. Diagnostic accuracy of PCT ≥2 ng/mL for sepsis was evaluated against sepsis 3 criteria.

Results

Among 441 patients, median age was 70 years, 201 (45.6 %) were female. The most frequent indication was uncertain cause of fever - 134 (30.3 %), followed by fever in cancer - 131 (29.7 %), fever in immunosuppressed patients - 140 (31.7 %) and evaluation of disease severity. Overall, antibiotics were prescribed in 335 patients (76.7 %). Antibiotic use was similar across PCT strata: 80.2 %, 75.8 %, 74.2 %, 78.8 % and 74.4 % in patients with PCT ≤0.1, 0.1–0.25, 0.25–0.5 0.5–2 and >2 ng/mL respectively (P=0.8461). Sepsis prevalence (sepsis-3 criteria) was 19.6% and PCT ≥2 ng/mL yielded a sensitivity of 51.3 %, specificity 88.8 %. PCT contributed meaningfully to diagnosis or antibiotic decision-making in 111 of 441 patients (25 %), highest in patients with immunosuppression (40 %).

Conclusion

In this ED cohort, PCT testing was frequently performed and antibiotics were prescribed to more 75 % of patients, largely independent of PCT value. A PCT threshold of ≥2 ng/mL showed good specificity but only moderate sensitivity for sepsis, suggesting a better role in ruling out than in confirming sepsis in this setting. The overall clinical usefulness of PCT for guiding antibiotic decisions appeared limited and highly dependent on indication, underscoring the need for clearer protocols on when to measure PCT and how to integrate its values into ED decision-making.

Keywords: diagnostic test; procalcitonin; sepsis

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PROLONGED LIMB COMPRESSION PRESENTING AS COMPARTMENT SYNDROME: A CASE REPORT

***Tea Štajduhar[1], Martina Pavletić[2], Tamara Petrić[2]**

Abtract

Prolonged limb compression can cause muscle ischemia, resulting in rhabdomyolysis, electrolyte disturbances and acute kidney injury. Acute compartment syndrome (ACS) is a serious condition caused by increased pressure in a closed fascial space, presenting with swelling, pain, neurological deficits and reduced pulses. Timely recognition in the emergency department (ED) is essential to allow early initiation of appropriate therapy, limb salvage and prevention of systemic complications such as acute kidney injury and electrolyte imbalances.

Case report

A 62-year-old male with a BMI 39,8 kg/m^2, a history of hypertension, diabetes and a previously implanted coronary stent was admitted after a domestic fall, and being trapped for 12 hours between his bed and a radiator, mainly compressing his left arm. On arrival, he was hemodynamically stable, with transient atrial fibrillation that converted spontaneously to sinus rhythm in the ED. Physical examination showed swelling and induration of both forearms, cold hands, diminished pulses and a neurological deficit of the left forearm. Laboratory tests revealed rhabdomyolysis, hyperglycemia, hyperkalemia and elevated creatinine with metabolic acidosis consistent with acute kidney injury. Dark urine was suggestive of myoglobinuria. X-ray of the left shoulder showed dislocation; two attempts at closed reduction were unsuccessful. Focused assessment with sonography in trauma (FAST) and computed tomography (CT) angiography showed no abnormalities. Aggressive therapy was initiated to lessen kidney injury, including fluids resuscitation, intravenous diuretics, prophylactic anticoagulation and analgesia for pain management. The patient was admitted to the intensive care unit, where he was managed in a multidisciplinary setting by a nephrologist, intensivist and traumatologist, and he recovered completely.

Conclusion

Prolonged limb compression can cause severe rhabdomyolysis even in hemodynamically stable patients. Suspected ACS requires urgent surgical and vascular evaluation. Early recognition and multidisciplinary coordination in the ED are essential to prevent irreversible renal and neuromuscular complications.

Keywords: compartment syndrome; rhabdomyolysis; trauma

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RECONSIDERING THE DIVISION BETWEEN PREHOSPITAL AND HOSPITAL EMERGENCY CARE: A MATTER OF ENVIRONMENT, NOT EXPERTISE

***Ana Tancabel Mačinković**[1]

Abstract

Emergency medicine in Croatia has long operated under an unofficial implication that treats hospital-based care as the gold standard while simultaneously viewing prehospital services as introductory or auxiliary. This viewpoint endures despite the lack of formal differentiation and ignores a crucial reality: emergency medicine constitutes early critical intervention, irrespective of location. The clinical methodology remains uniform across all settings. Management of airways, stabilization of hemodynamics, ventilatory assistance, shock intervention, trauma revival, and cardiac arrest procedures adhere to the same fundamental principles whether administered in a mobile unit or hospital emergency room. Variations arise from situational factors rather than professional capability. Prehospital emergency medicine operates under substantially reduced timeframes. Life-preserving interventions—establishing airways, delivering vasopressor medications, alleviating pain, sedating individuals, maintaining circulation—often require prompt execution without comprehensive diagnostic evaluation or specialist consultation. Although temporal pressures are more intense and clinical autonomy is heightened, the complexity and thoroughness of care remain equally robust. Within numerous advanced healthcare frameworks, prehospital emergency medicine is acknowledged as a sophisticated, critical-care-focused field with its own professional designation. In Croatia, emergency medicine represents a relatively young primary specialty, the prehospital sector continues to develop amid structural and personnel obstacles. Our analysis explores how professional culture influences perspectives within emergency medicine and advocates for reconceptualizing the prehospital-hospital dynamic.

Conclusion

Instead of maintaining hierarchical distinctions, emphasis should transition toward acknowledging the shared clinical basis of emergency care. The essential consideration is not the practice location, but rather the clinical decision-making approach employed in patient treatment. By transforming this perspective we could consolidate professional recognition, enhance cooperation across environments and promote emergency medicine's advancement in the future.

Keywords: critical care; integration; prehospital emergency medicine

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REFUSAL OF TREATMENT AND TRANSPORT IN OUTPATIENT EMERGENCY MEDICINE: LEGAL, ETHICAL, AND CLINICAL ASPECTS

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Abstract

Refusal of treatment is one of the most important challenges for emergency medical teams. In the field, it is necessary, in a short time, to reconcile respect for patient autonomy with the duty to protect life and health. In the Republic of Croatia, the basic legal framework consists of the Act on the Protection of Patients' Rights, the Bioethical Convention and the Act on the Protection of Persons with Mental Disorders, with the obligation to respect informed consent, but also the application of presumed consent in urgent, life-threatening conditions. The key to correct treatment is the assessment of the patient's decision-making capacity. It is based on four elements: understanding, respect, the ability to rationally reason and the consistent expression of choice. A patient who meets these criteria can validly refuse the proposed treatment. Challenging groups include minors, people with acute psychiatric disorders, intoxicated patients, and elderly patients with possible cognitive impairments, where the boundary between preserved and unimpaired autonomy is often unclear. High-risk refusals are particularly sensitive, which is why active, and sometimes paternalistic, communication is recommended. It is important to write detailed documentation that includes: a description of the clinical condition, assessments performed, information provided, capacity assessments, advice, and final decisions with a standardized checklist and a signed refusal statement. The development of national protocols and education of HMS teams on the legal and ethical aspects of refusing treatment are necessary to reduce the risk for patients and healthcare professionals and to improve the quality of prehospital care in Croatia.

Conclusion

Refusal of treatment in outpatient emergency medicine requires precise assessment of decision-making capacity, clear communication, and thorough documentation. National protocols and team education are necessary to optimally protect both patients and healthcare professionals.

Keywords: decision-making capacity; high-risk; prehospital; refusal

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RESPIRATORY DEPRESSION IN COMATOSE ALCOHOL-INTOXICATED PATIENTS: IMPACT OF CO-INGESTION AND AIRWAY MANAGEMENT – A 36-MONTH RETROSPECTIVE COHORT STUDY

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Abstract

Acute alcohol intoxication is a frequent cause of non-traumatic coma in emergency and intensive care. Co-ingestion of additional central nervous system (CNS) depressants—particularly benzodiazepines and opioids—may exacerbate respiratory depression beyond the effect of alcohol alone. We evaluated the differential impact of co-ingestion on respiratory compromise and the need for invasive airway support in comatose patients.

Methods

This 36-month retrospective cohort study was conducted at the only tertiary referral intensive care center in the region. Forty-eight consecutive comatose patients with toxicologically confirmed acute alcohol intoxication were included (approximately 16 cases per year). Toxicological classification was based on qualitative urine immunoassay screening. Patients were stratified into isolated alcohol intoxication (n=25), alcohol–benzodiazepine co-ingestion (n=13), and alcohol–opioid co-ingestion (n=10). Clinical variables comprised Glasgow Coma Scale (GCS), arterial blood gas parameters, blood alcohol concentration (BAC), and requirement for invasive mechanical ventilation. The primary endpoint was endotracheal intubation. Between-group comparisons were performed using Kruskal–Wallis and χ^2/Fisher tests.

Results

Mean BAC was comparable across groups (292 ± 54 mg/dL; p = 0.64). GCS differed significantly, being lowest in alcohol–opioid co-ingestion (7.8 ± 1.3 vs. 6.5 ± 1.0 vs. 5.0 ± 1.2; p < 0.01). Mean arterial pH progressively decreased (7.30 vs. 7.26 vs. 7.22; p = 0.04), while $PaCO_2$ increased (48 vs. 55 vs. 62 mmHg; p = 0.03), indicating worsening hypoventilation in mixed intoxications. Mechanical ventilation was required in 64.6%, with highest rates in opioid co-ingestion (48% vs. 76.9 % vs. 90 %; p = 0.02). Opioid co-ingestion independently predicted intubation (adjusted OR 3.8). Mortality was 4.2%, occurring only in mixed intoxications.

Conclusion

In this tertiary referral ICU cohort, co-ingestion of opioids or benzodiazepines significantly increased the severity of respiratory depression and the likelihood of invasive ventilation compared with isolated alcohol intoxication, despite comparable blood alcohol concentrations. Early risk stratification and timely airway protection remain essential to optimizing outcomes in this high-risk population.

Keywords: alcohol; coma; respiratory depression

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RHABDOMYOLYSIS AS A RESULT OF CAFFEINE INTOXICATION IN A SUICIDE ATTEMPT: A CASE REPORT

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Abstract

Intoxication is an increasingly recognized clinical entity within hospital emergency care departments, due to the availability of various substances. A wide range of severe cardiovascular and metabolic complications of intoxication remain to be studied.

Case report

A 19-year-old male patient was admitted to the hospital emergency department due to intoxication. As reported by the out-of-hospital emergency care physician, the patient ingested 200 tablets, each containing 200 mg of caffeine, mixed with an energy drink. The medical history revealed suicidal ideation and one previous suicide attempt involving alcohol and diazepam ingestion. Symptoms associated with intoxication included sinus tachycardia with a heart rate of 140/min without hemodynamic compromise, profuse vomiting of dark-coloured content, and agitation. Further physical examination revealed no additional abnormalities. The patient also reported a sore throat, upper limb pain, palpitations and nausea. Initial laboratory tests demonstrated leukocytosis, hypokalemia and mild metabolic acidosis. Mildly elevated liver enzymes and D-dimers were noted. Creatine kinase (CK) levels were markedly elevated. The patient was initially treated with symptomatic and supportive therapy and was subsequently admitted to the intensive care unit (ICU). An increasing trend of CK (500 IU/L to >5000 IU/L) suggested rhabdomyolysis, in the context of intoxication and psychomotor agitation. Initially, the patient was psychotic with expressed suicidal intent. Later during hospitalization, he was cooperative, with correction of metabolic parameters, cessation of vomiting and rhythm stabilization. Improvement in somatic condition and hemodynamic stabilization were observed. Following regression of relevant laboratory parameters under conservative therapy, the patient was discharged and referred for further treatment at a psychiatric institution. Adequate fluid intake was emphasized among recommendations.

Conclusion

This case report underscores the typical clinical features of caffeine intoxication, while highlighting potentially severe systemic consequences, such as rhabdomyolysis. Therefore, early recognition and close laboratory monitoring are crucial when approaching intoxicated patients.

Keywords: caffeine; rhabdomyolysis; tachycardia; toxicology

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SEIZURE UNMASKING EUGLYCEMIC KETOACIDOSIS IN ACUTE PANCREATITIS – A CASE REPORT

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Abstract

Euglycemic ketoacidosis is a rare metabolic complication, most commonly seen in pregnant women with diabetes or patients treated with SGLT2 inhibitors. Fasting and alcohol use are additional risk factors, while acute pancreatitis—alcoholic or not—is an underrecognized cause.

Case report

A 32-year-old woman presented to the emergency department with diffuse abdominal pain. It began the previous day around 14:00 in the epigastrium, was sharp, constant, radiating to the back, and unrelieved by ibuprofen 400 mg. By evening, the pain spread throughout the abdomen and intensified to 10/10 on the Numeric Rating Scale. She reported two vomiting episodes; last bowel movement was normal. She denied fever, urinary symptoms, alcohol use, smoking, chronic illness, or regular medications. She had an ectopic pregnancy in 2024; last menstrual period was one week earlier. Family history was positive for type 2 and type 1 diabetes. Examination revealed a diffusely tender but soft abdomen without palpable masses or organomegaly, with preserved bowel sounds. Given her family history and diffuse abdominal pain, capillary glucose was measured and found to be 8.6 mmol/L, interpreted as mild stress hyperglycemia. She received pantoprazole, metoclopramide, and tramadol. Five minutes later, she developed a generalized tonic–clonic seizure in the waiting room. Repeat testing showed glucose 9.4 mmol/L, ketones 8.6 mmol/L, and metabolic acidosis on i-STAT. Brain MSCT excluded acute intracranial pathology. Aspartate aminotransferase (AST) 266 U/L, alanine aminotransferase (ALT) 113 U/L, Gamma-glutamyl transferase (GGT) 678 U/L, total bilirubin 31 µmol/L, conjugated bilirubin 14.8 µmol/L, lipase 1620 U/L, C-reactive protein (CRP) 35.4 mg/L, and ethanol <0.10 g/L. She was admitted to the ICU, and abdominal MSCT confirmed acute necrotizing pancreatitis.

Conclusion

Acute pancreatitis can precipitate euglycemic ketoacidosis, even with unreported alcohol use. Our patient's laboratory findings suggested a possible alcoholic component, although Kabadi syndrome cannot be excluded. Clinicians should assess ketones and acid-base status in clinically suspected ketoacidosis despite mild hyperglycemia.

Keywords: acidosis; ketosis; pancreatitis; seizures

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SEPSIS WITHOUT FEVER: A DIAGNOSTIC TRAP IN THE EMERGENCY DEPARTMENT

***Eneida Hoxha[1], Ledio Collaku[1], Albana Kociaj[1], Pandush Pojani[1], Somida Kuka[1], Matilda Kambo[1], Xhesika Habilaj[1], Margarita Resuli Gjata[1]**

Abstract

Sepsis is a time-critical condition frequently encountered in the emergency department (ED), where early recognition is essential for patient survival. However, the absence of fever may significantly delay diagnosis, as body temperature is often perceived as a primary diagnostic trigger. Elderly patients and those with chronic diseases or immunosuppression may develop sepsis without hyperthermia, leading to underestimation of disease severity and delayed initiation of life-saving interventions. The aim of this abstract is to highlight afebrile sepsis as a common diagnostic pitfall in the ED and to emphasize the importance of clinical suspicion beyond body temperature abnormalities.

Clinical Perspective

In daily ED practice, sepsis without fever often manifests through nonspecific clinical features such as altered mental status, unexplained hypotension, tachypnea, or metabolic derangements. When fever is used as a prerequisite for sepsis consideration, early warning signs may be overlooked, particularly in vulnerable patient populations.

Clinical Implications

Approaching sepsis as a clinical diagnosis rather than a temperature-driven condition enables earlier diagnostic evaluation and timely therapeutic intervention. Failure to consider sepsis in afebrile patients frequently leads to delayed management, progression to organ dysfunction, and clinical deterioration.

Conclusion

The absence of fever should not exclude the diagnosis of sepsis in the Emergency Department. Afebrile sepsis represents a critical diagnostic trap, especially among elderly and multimorbid patients. Recognizing subtle clinical warning signs and maintaining a high index of suspicion are essential steps in improving patient safety and outcomes in emergency care.

Keywords: afebrile; diagnosis; emergency; geriatrics; sepsis

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SEVERE TRAUMATIC BRAIN INJURY: EARLY EMERGENCY DECISIONS AND CLINICAL OUTCOME

***Antonio Šegota[1], Bruno Sen[1], Tomislava Mrgan[1]**

Abstract

Traumatic brain injury (TBI) is defined as an alteration in brain function or other evidence of brain pathology caused by an external force. It represents a major cause of morbidity and mortality in young trauma patients.

Case report

A young patient was involved in a high-energy motor vehicle rollover collision. The vehicle was completely crushed, requiring technical extrication by firefighters. Approximately 20 to 30 minutes elapsed before medical access was possible. Initial assessment revealed unconsciousness ((Glasgow Coma Scale 3 (GCS)) with spontaneous breathing, oxygen saturation of 77 %, blood pressure of 90/50 mmHg, and bilaterally dilated, non-reactive pupils. Endotracheal intubation was attempted; however, cervical stabilization and profuse oropharyngeal bleeding prevented adequate airway visualization despite suctioning. A supraglottic airway device was inserted to ensure rapid oxygenation and enable urgent transport. Upon arrival at the emergency department, structured reassessment was performed, followed by definitive endotracheal intubation under controlled conditions. Laboratory evaluation demonstrated metabolic acidosis and early trauma-induced coagulopathy. CT imaging revealed subarachnoid and intraventricular hemorrhage, diffuse cerebral contusions, severe cerebral edema, and multiple skull base fractures. Despite hemodynamic stabilization with transfusion therapy and vasopressor support, CT angiography confirmed the absence of intracranial blood flow. Brain death was diagnosed according to established criteria. Continued organ-support management enabled successful multiorgan procurement.

Conclusion

This case highlights the decisive impact of early hypoxia and hypotension in severe TBI and reinforces the critical role of emergency medicine in preventing secondary brain injury through timely, structured resuscitation.

Keywords: brain; brain death; injuries; traumatic

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SIMULATION TRAINING IN GEOGRAPHICALLY REMOTE AREAS LACKING ADVANCED MEDICAL SERVICES: BUILDING CAPACITY THROUGH REALISTIC PRACTICE

***Albana Kociaj[1], Matilda Kambo[1], Elien Gjata[1], Edmond Zaimi[1]**

Abstract

Geographically remote communities face profound healthcare challenges due to isolation, limited resources, and training gaps. Clinics in these areas often operate with few specialists or advanced tools, and providers encounter rare but high-stakes emergencies, leading to low skill retention. Staffing shortages force generalists and nurses to cover broad scopes of practice, while terrain and distance hinder patient transport and access to training. Simulation-based training offers a strategic solution, bringing realistic, high-impact practice directly to underserved providers. Evidence shows simulation enhances clinical skills, team performance, and provider confidence, especially for rare emergencies. Innovative modalities—from mannequin-based and virtual reality simulators to mobile units and in-situ training—allow flexible, cost-effective deployment in resource-limited settings. A case study of a Basic Life Support (BLS) / First Aid program for rural Albanian health workers, in partnership with Solidar Foundation, demonstrates measurable skill improvements and positive outcomes. Prioritizing such programs empowers remote healthcare systems, strengthens patient safety, and promotes health equity across underserved regions.

Methods

A multi-modal simulation program was implemented for rural Albanian health workers to address geographic isolation, limited resources, and training gaps. The program combined in-situ scenarios, mannequin-based simulations, and mobile simulation units to replicate rare emergencies such as trauma, obstetric crises, and cardiac arrests, with virtual reality modules supplementing hands-on practice. Baseline assessments measured knowledge, procedural skills, and confidence, followed by post-training evaluations using scenario-based assessments and self-reported surveys.

Results

Participants showed significant improvements: BLS and First Aid procedures were performed more accurately, emergency responses were faster, and confidence in managing high-stakes events increased. Peer learning and repeated practice supported skill retention, while mobile and flexible training ensured accessibility across dispersed clinics.

Conclusion

Simulation proves a practical, cost-effective solution for strengthening remote healthcare capacity. It enhances provider competency, team performance, and patient safety, offering a scalable strategy to bridge training gaps and promote health equity in underserved regions.

Keywords: healthcare; prehospital; simulation

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SOMETHING'S WRONG, I CAN FEEL IT

***Nikolina Boršćak Tolić**[1]

Abstract

Establishing a diagnosis consists of a well-taken anamnesis and clinical status, complemented by various other diagnostic procedures. However, sometimes a seemingly unconvincing finding can evoke a sense that something is not quite right with the patient. That feeling is present because of several factors, such as subconscious recognition of patterns that comes with clinical experience, observing discrete clues on the patient, and, of course, the phenomenon we call intuition, or the ability to evaluate something as off, although there is no physical reason to believe so. The downside of this way of evaluation is the fact that sometimes the physician's negative traits can lead the diagnosis into the wrong direction. Another problem is the difficulty in objectification, which leads to the inability to educate staff on how to implement these methods, and it makes it hard to quantify so it can justify further diagnostic methods. Despite these problems, the consensus of studies that regard this topic is that this type of clinical assessment is extremely important and should not be neglected compared to other diagnostic methods. It is extremely important in emergency medicine, where speed of assessment is key, so the ability of intuitive assessment can sometimes mean the difference between life and death.

Conclusion

These days clinicians sometimes rely too much on diagnostic methods dependent on machines, while simultaneously neglect the fundamental aspect of establishing a diagnosis—the clinical examination. The anamnesis and clinical status alone can confirm the diagnosis in most cases, especially if elements of intuitive thinking are implemented along with them. In the era of artificial intelligence, the human factor is even more important because currently no machine can fully replace it. In the end, we should never forget that the patient's health is in our hands, not in the hands of a machine.

Keywords: clinical intuition; diagnostic decision-making; human factors in medicine

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SPONTANEOUS INTRACRANIAL HYPOTENSION FOLLOWING MINOR TRAUMA: A DIAGNOSTIC CHALLENGE IN THE EMERGENCY DEPARTMENT

***Ivana Škara[1], Vlasta Vuković Cvetković[2], Martina Pavletić[2]**

Abstract

Spontaneous intracranial hypotension (SIH) is an uncommon but clinically significant cause of secondary headache. Patients typically present with an ortosthatic headache, and additionally, by all or some of the following symptoms: nausea, tinnitus, pain along the spinal cord, phonophobia and cognitive symptoms. Early recognition in the emergency department (ED) is essential to ensure appropriate diagnosis and timely management, typically by epidural blood patch and in some cases surgery. We present a case of SIH although a trigger as minor trauma could not be excluded and propose a practical algorithm for evaluation and management of patients suspected with SIH.

Case report

A 47-year-old female presented to the ED with a severe, five-day headache occurring in the upright position and nearly resolved when supine. The pain was accompanied by nausea, bilateral tinnitus, and interscapular pain. Three weeks earlier, she suffered a fibular fracture after falling onto her back. She denied any previous lumbar puncture or other invasive procedures. Neurological examination revealed no focal deficits, and computed tomography of the brain was unremarkable. Based on the typical orthostatic presentation and unremarkable initial imaging, SIH was suspected in the ED. The patient was referred to a specialized headache clinic for further diagnostic workup and therapy.

Conclusion

This case underscores the importance of considering SIH in patients presenting with orthostatic headache, even after seemingly minor trauma. Clinical assessment in the emergency settings plays a crucial role in identifying patients who require further targeted evaluation.

Keywords: headache; intracranial hypotension; spontaneous

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STEPWISE APPROACH TO PATIENTS IN CARDIOGENIC SHOCK: A CASE REPORT

***Alisa Zobel[1], Jasmin Hamzić[1], Ivan Gornik[1]**

Abstract

Cardiogenic shock is a life-threatening condition with short-term mortality approaching 40 %, making early recognition and prompt initiation of treatment essential. Despite advances in pharmacologic and mechanical circulatory support, outcomes remain poor, particularly in elderly patients with multiple comorbidities. Early identification of the underlying cause and rapid implementation of structured management algorithms are therefore critical to improving survival.

Case report

An 89-year-old patient with known cardiac comorbidities was brought to the emergency department by emergency medical services due to acute shortness of breath. On arrival, the patient was agitated and tachypnoeic, with diffuse pulmonary rales, pale and sweaty skin, and pronounced mottling. Vital signs indicated hypotension, tachycardia, and hypoxemia. ECG revealed an irregular, wide-complex tachycardia of 180 bpm. Immediate synchronised cardioversion was attempted three times at maximum energy unsuccessfully. This was followed by administration of 300 mg amiodarone over 20 minutes and 0.5 mg methyldigoxin, after which the ventricular rate slowed. Point-of-care ultrasound demonstrated pulmonary and peripheral congestion and estimated severely reduced left ventricular ejection fraction. Non-invasive ventilatory support was initiated, along with vasopressor and inotropic therapy: norepinephrine at 0.1 mcg/kg/min, followed by dobutamine at 2.5 mcg/kg/min. With gradual escalation of vasopressor support, mean arterial pressure improved and skin mottling resolved. Due to persistent metabolic lactic acidosis, the patient was intubated and, in agreement with the on-call intensivist, transferred to the intensive care unit.

Conclusion

Current guidelines emphasise that early initiation of therapy is a key determinant of survival in cardiogenic shock. Importantly, the clinical presentation and vital signs are often sufficient to support a presumptive diagnosis without the immediate need for invasive hemodynamic monitoring. Furthermore, point-of-care ultrasound is gaining importance in early assessment. In this case, stepwise adherence to critical-illness management algorithms and timely escalation of therapy contributed to achieving initial hemodynamic stabilisation.

Keywords: cardiogenic shock; cardioversion; POCUS; vasopressors

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THE IMPORTANCE OF A MULTIDISCIPLINARY APPROACH AND TREATMENT OF RECURRENT SUPRAVENTRICULAR TACHYCARDIA IN THE GERIATRIC POPULATION – A CASE REPORT

***Jakov Jurić[1], Barbara Kauzlarić[1], Krešimir Šofić[1], Branka Bardak[1]**

Abstract

Supraventricular tachycardia (SVT) is a cardiac rhythm disorder characterized by a sudden onset and spontaneous termination of a rapid heart rate, usually 160–200 bpm. It is a regular rhythm with narrow QRS complexes caused by impulse re-entry within the atrium due to changes in the cardiac conduction system. Episodes may last from a few minutes to several hours. Although generally benign, it can cause palpitations, chest pain or discomfort, and shortness of breath. Treatment includes vagal maneuvers or medications such as adenosine and verapamil, following the guidelines of the European Society of Cardiology.

Case report

At approximately 22:00, the emergency medical dispatch unit received a call from a 75-year-old patient complaining of palpitations and difficulty breathing. Upon arrival, the patient described palpitations and dyspnea as his primary symptoms and stated that he had a history of supraventricular tachycardia, making these symptoms familiar to him. He reported baseline breathing difficulties, which worsened during episodes of the described arrhythmia. Non-pharmacological methods for suppressing tachycardia were attempted, however, the patient warned that they would likely be unsuccessful. The patient was administered 6 mg of intravenous adenosine, which resulted in rapid conversion of supraventricular tachycardia to sinus rhythm. The patient was stabilized and advised to consult his family physician, as he refused hospital transport. The patient's medical history includes benign prostatic hyperplasia, supraventricular tachycardia, right upper lobectomy in 2011, and current adenocarcinoma of the left lung. His chronic therapy consists of a beta-blocker, an antitussive, and medication for benign prostatic hyperplasia.

Conclusion

The European Society of Cardiology guidelines describe the use of beta-blockers or calcium channel blockers for the prevention of frequent episodes, and catheter ablation as a Class I recommendation. This patient represents a typical example of the importance of an individualized approach in patients who cannot undergo and/or do not respond adequately to guideline-directed therapy.

Keywords: antiarrhythmic; palpitations; supraventricular tachycardia

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THE INVISIBLE THREAT: AORTIC DISSECTION WITHOUT WARNING THE INVISIBLE THREAT: AORTIC DISSECTION WITHOUT WARNING

***Ana Šverko[1]**

Abstract

Aortic dissection is one of the most life-threatening cardiovascular emergencies, classically presenting with sudden, severe chest or back pain. However, its clinical presentation may be highly variable and occasionally subtle, making diagnosis particularly challenging in emergency settings.

Case report

A 69-year-old man was brought to the emergency department by Emergency medical service due to brief, transient chest pain. Earlier that morning, approximately one hour prior to admission while walking, he experienced central chest pain without radiation or diaphoresis. The pain intensified with deep inspiration and extended toward the neck, lasted approximately two minutes, and resolved spontaneously. Upon arrival, the patient was asymptomatic, in good general condition and hemodynamically stable. The rest of the physical examination was unremarkable. ECG was without abnormalities and serial troponin levels showed no trend. A markedly elevated D-dimer level and soft tissue density in the right atrium region possibly representing superimposed vascular structure on the chest radiography were the findings suggested that aortic dissection was the most probable diagnosis. Point-of-care echocardiography revealed dilatation of the thoracic aorta. Computed tomography ultimately confirmed a Stanford type A aortic dissection. After appropriate preparation patient was urgently admitted to the intensive care unit and underwent surgical operation.

Conclusion

This case illustrates how aortic dissection may present with minimal, transient symptoms and an initially reassuring clinical and laboratory evaluation, especially bedside ultrasound. It underscores the importance of maintaining a high index of suspicion and a systematic diagnostic approach in patients with chest pain, even when the presentation appears benign.

Keywords: aortic dissection; diagnostic challange

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TINGLING OR SOMETHING MORE?

***Adrian Sallabi[1], Lea Miklić[1], Sanja Krüger[1]**

Abstract

Hypomagnesemia is a well recognized reversible cause of cardiac arrhythmias, including atrial fibrillation, due to its role in myocardial electrical stability. In patients with chronic gastrointestinal diseases such as eosinophilic gastroenteritis, persistent diarrhea may lead to significant electrolyte depletion. This case highlights the importance of identifying the underlying cause of severe electrolyte imbalance, as it may signal a more serious intra-abdominal pathology.

Case report

A female patient with a known history of eosinophilic gastroenteritis and chronic diarrhea presented to the emergency department with facial and upper limb tingling that had begun the previous day. The symptoms were associated with palpitations and lightheadedness. On physical examination, an irregular heart rhythm was observed. A 12-lead electrocardiogram confirmed new onset atrial fibrillation. Laboratory investigations demonstrated severe hypomagnesemia accompanied by hypocalcemia. Intravenous electrolyte replacement therapy was initiated promptly. Following correction of magnesium and calcium levels, conversion to sinus rhythm was achieved. Due to the patient's later complaint of abdominal pain and elevated inflammatory parameters, a contrast-enhanced abdominal computed tomography scan was performed. Imaging revealed small bowel strangulation, presumably caused by an exacerbation of eosinophilic gastroenteritis. The patient underwent urgent surgical intervention. The postoperative course was uneventful, and she was discharged in good general condition.

Conclusion

Severe hypomagnesemia can precipitate reversible atrial fibrillation and may present with nonspecific neurological symptoms such as tingling. In patients with underlying gastrointestinal conditions, including eosinophilic gastroenteritis, electrolyte disturbances should prompt careful evaluation for potential acute complications. Early recognition of the underlying cause is essential for timely and appropriate management.

Keywords: atrial fibrillation; eosinophilic gastroenteritis; hypomagnesemia

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TRANSIENT GLOBAL AMNESIA FOLLOWING A STRESSFUL EVENT – A CASE REPORT

***Lovro Jančić[1], Nikolina Požega[1], Ana Katić[1], Karolina Beg[2], Ervin Jančić[2]**

Abstract

Introduction transient global amnesia (TGA) is characterized by the sudden onset of a transient disturbance of short-term memory with preserved consciousness and absence of focal neurological deficits. It most commonly occurs in middle-aged and older individuals, often following emotional or physical stress. The aim of this report is to present a case of a patient with a clinical presentation suggestive of TGA.

Case report

Case presentation A 65-year-old female patient was evaluated in a neurological day hospital between January 15 and January 22, 2026, due to an episode of amnesia occurring after a stressful event accompanied by a sudden increase in arterial blood pressure. During the episode, she exhibited memory loss for ongoing events, without impairment of consciousness or motor deficits. Neurological examination on admission was unremarkable, without focal deficits (blood pressure 175/88 mmHg, heart rate 107/min). Brain multislice computed tomography (MSCT) showed no evidence of acute intracerebral pathology, with an incidental finding of an old lacunar lesion in the left basal ganglia. Transcranial doppler and carotid color doppler ultrasound, electroencephalography (EEG), and 24-hour holter electrocardiogram revealed no significant pathological abnormalities. Laboratory findings were within normal limits, except for elevated total and low-density lipoprotein (LDL) cholesterol levels.

Conclusion

The clinical presentation characterized by sudden-onset amnesia following a stressful event, normal neurological examination, normal EEG findings, and complete recovery without residual deficits supports the diagnosis of TGA. Transient ischemic attack and epileptic amnesia were considered in the differential diagnosis; however, the clinical course and negative diagnostic workup favored TGA. Acute emotional stress and hypertensive response may represent potential triggering factors. Conclusion This case illustrates a typical clinical presentation of transient global amnesia triggered by a stressful event. Timely differentiation of TGA from transient ischemic attack and epileptic phenomena is essential in everyday emergency and neurological practice in order to avoid unnecessary diagnostic procedures and ensure appropriate management.

Keywords: acute amnesia; transient global amnesia

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TREATMENT OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) PATIENTS IN EMERGENCY DEPARTMENT (ED) OF KBC OSIJEK – DO WE FOLLOW NATIONAL GUIDELINES?

***Sanela Unfirer**[1]

Abstract

Patients with acute exacerbation of chronic obstructive pulmonary disease (COPD) by acute dyspnoea are common in ED. From 2024 we have new national guidelines for the management of acute exacerbations of chronic obstructive pulmonary disease in emergency medicine. Aim of this study is check out if national guidelines are followed.

Methods

We collected data from hospital informatic system in the period from January 1, 2025 to December 31, 2025. We throughly check therapy that acute exacerbation of COPD patients received in ED of KBC Osijek.

Results

In total of 20 903 patents there was 191 (0,9%) patients with acute exacerbation of COPD (110 men, 81 women average age of 70 years). 148 patient was received conventional oxygen therapy (COT), 6 patient was received high flow nasal cannula (HFNC) therapy and 37 patients received noninvasive ventilation (NIV). All patients also received medicament therapy: inhalation of salbutamol/ipratropium bromid (155 patient (81%)), intravenous corticosteroids (113 patients, 59 %), aminophylline (68 patients, 35 %), furosemide (50 patients. 26%), antibiotics (10 patients, 5 %) and inhalation of N acetylcysteine with hypertonic NaCl-Viscoflu (10 patients, 5 %). We noted high rate of hospitalisation (43 %) and high rate of mortality (12). Thirty-four percent of patients who were discharged from the hospital returned to the emergency department (ED) within the current year, and 19% of them were readmitted to the hospital due to exacerbation of chronic obstructive pulmonary disease.

Conclusion

We still use aminophylline in treatment acute exacerbation of COPD and have high rate of hospitalisation and mortality. Rason to this may be because lot of our patients are in final stage of COPD (31% use home oxygen therapy). We started to use newel oxygen delivery devices like HFNC. In 19% of patients, we use NIV and by that we decreased rate of intubation to only 19%. We follow guidelines but we can do better in the future.

Keywords: COPD; HFNC; national guidelines

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UNDERUSE OF EVIDENCE-BASED HEART FAILURE THERAPY IN THE EMERGENCY DEPARTMENT: A RETROSPECTIVE ANALYSIS

***Vedrana Jović[1], Lucija Rukavina[1], Iva Marinović[1], Ana Pelčić[1], Afan Ališić[1], Martina Pavletić[1-2]**

Abstract

New onset heart failure (HF) or acute decompensation of previously diagnosed chronic HF is a frequent reason for emergency department (ED) visits, providing an important opportunity to optimize guideline-directed medical therapy (GDMT). Aim of this study was to analyze HF therapy in ED patients, evaluate changes before and after ED visit, and identify opportunities for optimization.

Methods

Patients (>18 years) presented in the ED with HF symptoms between May-June 2024 were analyzed retrospectively. Demographics, chief complaint, laboratory results, pre-ED medication, and recommended therapy changes were extracted from electronic medical records.

Results

Study included 310 patients (51% male), median age 80 (25-99) years, admitted for acute HF symptoms. Dyspnea was the most common presenting symptom, followed by leg edema and chest pain. New-onset HF was diagnosed in 75 patients (24 %), with 65% subsequently hospitalized with mortality of 4%. Echocardiography was performed in 42 % of patients without prior records. Among those with known Heart Failure (HF), the most frequently prescribed drugs were diuretics (74 %), beta-blockers (72 %), Renin–Angiotensin–Aldosterone System (RAAS) inhibitors (61 %), oral anticoagulants (57 %), Sodium–Glucose Cotransporter 2 (SGLT2) inhibitors (24 %), and Mineralocorticoid Receptor Antagonists (MRAs) (16.8 %). Therapeutic modification occurred in 88% of patients: diuretics (79 %), RAAS inhibitors (36 %), beta-blockers (33 %), SGLT2 inhibitors (25 %), and oral anticoagulants (22 %). No significant differences in treatment adjustment were observed by HF category, sex, or age. Among patients with atrial fibrillation (49 %), 8 % had no anticoagulation, pre-ED; post-ED, therapy was initiated in 50%, and in 93% of new-onset AF cases. Blood pressure and first ED manifestation of HF were predictors of therapy modification.

Conclusion

Therapeutic modifications were frequent in predominantly elderly patients presenting to the ED with symptomatic HF. However, key components of GDMT – particularly RAAS inhibitors, MRAs, and SGLT2 inhibitors – remained substantially underused both before and after ED visit.

Keywords: GDMT; heart failure; SGLT2 inhibitors

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UNEXPLAINED HEMOPTYSIS AND HEMATOCHEZIA LEADING TO LIFE-THREATENING RESPIRATORY FAILURE REQUIRING ECMO IN A YOUNG PATIENT

***Kristijan Šimunić[1], Martina Pavletić[2], Klara Poldan Skorup[2]**

Abstract

Acute respiratory failure in previously healthy young male is rare and often diagnostically challenging, particularly when accompanied by systemic symptoms and multiorgan involvement. Early recognition, rapid stabilization, and timely escalation of supportive care can be lifesaving, even before a definitive diagnosis is established.

Case report

A previously healthy 19-year-old presented to the emergency department (ED) with fever (39 °C), hematemesis, hemoptysis, and progressive dyspnea following recent travel and environmental exposure. On admission, initial examination revealed tachycardia, hypoxemia (SpO_2 90 %), and signs of respiratory distress. Laboratory findings showed leukocytosis and elevated inflammatory markers, while platelets and coagulogram were normal. Chest imaging demonstrated diffuse bilateral pulmonary infiltrates without focal consolidation. Rapid clinical decline occurred shortly after admission, with refractory hypoxemia despite high-flow oxygen therapy. Urgent endotracheal intubation and invasive mechanical ventilation were initiated. Despite lung-protective strategies, neuromuscular blockade, and vasopressor-supported hemodynamic stabilization, severe hypoxemia persisted. Broad-spectrum antimicrobial therapy, corticosteroids, anticoagulation, and supportive measures were initiated. Bronchoscopy revealed inflammatory and hemorrhagic airway secretions, without definitive microbiological diagnosis. Due to refractory respiratory failure and life-threatening hypoxemia, veno-venous extracorporeal membrane oxygenation (VV-ECMO) was initiated emergently, resulting in improved oxygenation and clinical stabilization. Continuous monitoring and gradual reduction of ventilatory support followed. Over subsequent days, inflammatory markers declined, respiratory function improved, and ECMO was discontinued. The patient was subsequently weaned from mechanical ventilation, extubated without complications, and discharged home in good general condition. Despite extensive diagnostic evaluation, no definitive underlying etiology was identified.

Conclusion

This case highlights the critical importance of early recognition and aggressive stabilization of rapidly progressive respiratory failure in young patients. Prompt escalation to advanced supportive therapies, including ECMO, can be lifesaving even when the underlying diagnosis remains uncertain. Survival in such cases depends less on immediate definitive diagnostic certainty and more on decisive physiologic stabilization and multidisciplinary critical care intervention.

Keywords: ECMO; hematemesis; hemoptysis; inflammation; respiration

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USE OF NONINVASIVE VENTILATION (NIV) IN EMERGENCY DEPARTMENT (ED) OF UHC OSIJEK

***Sanela Unfirer**[1]

Abstract

Noninvasive mechanical ventilation (NIV) is ventilatory support without endotracheal intubation. NIV become standard procedure for treatment of acute respiratory insufficiency in emergency settings. Aim of this study is to evaluate use of NIV in our emregency department in comparison to year 2018. In year 2018 we have14 patient in period of one and a half year.

Methods

We collect data from hospital informatic system and include every patient who underwent NIV therapy in ED of KBC Osijek in period of in the period from January 1, 2025 to December 31, 2025.

Results

In total of 20 903 patient 103 (0,5 %) underwent NIV therapy. There was 51 men and 52 women, average age of 74 years. Acute respiratory insufficiency results from chronic obstructive pulmonary disease (COPD) (37), heart decompensation (36), pulmonary oedema (27) and pneumonia (3). A total of 99 (96 %) patients were admitted to hospital, 35 (34 %) died and 26 (25 %) was intubated when admitted in intensive care unit. When we compared blood gases samples among deceased and survived, we noted that patients who remains in respiratory acidosis after initial therapy have 2 time more chance to die ($p<0,02$, risc ratio 1.97 (95% CI 1.17-3.33). Indications for NIV therapy was made from emergency medicine specialists (66), emergency medicine residents (8) and other specialists (29).

Conclusion

There is massive improvement in use of NIV therapy in patients with acute respiratory insufficiency in compare with year 2018. We hope we decrease mortality and need for endotracheal intubation. In 2018 indication for NIV was made by emergency medicine residents who now are all emergency medicine specialists. During our education numbers of NIV course make difference

Keywords: emergency department; noninvasive ventilation; respiratory insufficiency

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VALPROATE-INDUCED HYPERAMMONEMIC ENCEPHALOPATHY

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Abstract

Valproate is a commonly used drug for treating epilepsy and various psychiatric disorders. Although hyperammonemia is a relatively common adverse effect of valproate, progression to valproate-induced hyperammonemic encephalopathy (VHE) is rare and potentially life-threatening. The exact pathophysiology of VHE remains incompletely understood, but it likely involves urea cycle inhibition, leading to hyperammonemia, cerebral glutamine accumulation, and edema. It typically presents with encephalopathy symptoms such as altered mental status, lethargy, vomiting, increased seizure frequency, and variable neurological deficits, often making it difficult to distinguish from worsening psychiatric or neurological illness.

Case report

We present the case of a 33-year-old woman with pharmacoresistant epilepsy, initially diagnosed as juvenile myoclonic epilepsy and later complicated by post-traumatic structural epilepsy, also followed by psychiatry for alcohol use disorder. Her long-term medications included valproate alongside other antiepileptics, antidepressants, anxiolytics, and antipsychotics. The patient was admitted to the emergency department due to anamnestic data on a change/disorder of the quantitative state of consciousness manifested by somnolence progressing to sopor in the last 3 days. Acute mental decompensation was initially ruled out by a psychiatrist. In neurological examination, apart from quantitative disorder of consciousness, there was no acute focal deficit. Emergency neuroimaging showed no acute pathological findings. The electroencephalogram showed diffuse slow cerebral activity, more prominently bilateral frontotemporally. Given the history of chronic alcoholism, laboratory tests were extended to plasma ammonia levels, which were elevated despite normal liver function tests. The patient was admitted to the neurology unit, where her valproate dose was reduced, and lactulose therapy initiated. Subsequently, ammonia levels normalized, and her mental status returned to baseline. The clinical team concluded that the patient had VHE.

Conclusion

VHE is an uncommon but potentially serious complication of valproate therapy. Any sudden mental status change in a patient on valproate should raise suspicion for VHE, enabling timely diagnosis and treatment.

Keywords: encephalopathy; hyperammonemia; valproate

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WHEN CHEST PAIN STRIKES IN PREGNANCY: THE CTPA OR V/Q SCAN DILEMMA

***Natalija Volgemut[1], Martina Pavletić[2], Dijana Dumić[2], Ivana Rosić[2]**

Abstract

Acute chest pain in pregnancy represents a significant diagnostic challenge in emergency medicine, particularly when pulmonary thromboembolism (PTE) must be excluded. Physiological changes in pregnancy, including hypercoagulability and naturally elevated D-dimer levels, complicate diagnostic evaluation. Imaging selection in suspected PTE during pregnancy presents a clinical dilemma, primarily between computed tomography pulmonary angiography (CTPA) and ventilation–perfusion (V/Q) scintigraphy. The decision must balance diagnostic accuracy, maternal and fetal radiation exposure, gestational age and local resource availability.

Case report

A 34-year-old woman, at 19 weeks of gestation, was admitted to the emergency department with acute pleuritic chest pain localized to the left hemithorax, spreading intermittently to the back. The pain was provoked by deep inspiration and sudden movements. She denied dyspnoea, palpitations, syncope, fever, or recent illness. On admission, she was hemodynamically stable and afebrile, with normal cardiopulmonary examination and no signs of deep vein thrombosis (DVT). Laboratory tests showed elevated D-dimer, mild leucocytosis, negative high-sensitivity troponin, and normal NT-proBNP. Arterial blood gases analysis demonstrated mild respiratory alkalosis, and the ECG showed sinus rhythm with S1Q3T3 pattern. Transthoracic echocardiography revealed normal chamber dimensions, preserved left ventricular systolic function (EF 70 %), no right ventricular strain, and no significant valvular abnormalities. Compression ultrasound of lower extremity veins was negative for DVT. Given persistent clinical suspicion for pulmonary thromboembolism (PTE) and after informed consent, Computed Tomography Pulmonary Angiography (CTPA) was performed. The study showed normal opacification of pulmonary arteries without evidence of embolism. The patient remained clinically stable and asymptomatic until discharge.

Conclusion

This case underscores the diagnostic challenge of suspected PTE in pregnancy, where physiological alternations can mimic disease. When clinical suspicion persists despite non-invasive evaluation, definitive imaging should not be delayed. Appropriate selection between CTPA and V/Q scintigraphy should be guided by clinical probability, gestational age, and institutional expertise to ensure diagnostic accuracy and maternal safety while minimizing fetal radiation risk exposure.

Keywords: diagnostic imaging; pregnancy; pulmonary embolism

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WHEN INFECTION IS NOT THE CAUSE: DELAYED SPLENIC RUPTURE MIMICKING PNEUMONIA

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Abstract

Delayed splenic rupture (DSR) is a rare but potentially life-threatening complication of blunt abdominal trauma, occurring days to weeks after the initial injury. Early imaging may be negative, making diagnosis challenging. Clinical presentation is often nonspecific and may mimic infectious or pulmonary conditions.

Case report

A 60-year-old man was referred to the emergency department with dyspnea, cough, fever, and elevated inflammatory markers, with presumed pneumonia. His medical history included post-traumatic stress disorder (PTSD) and cerebral atrophy with functional dependence. One week before admission, he had presented with upper abdominal pain, chest pain and dyspnea. Initial evaluation, including chest radiography, was unremarkable. A psychogenic component was considered due to his psychiatric history. However, early pneumonia could not be excluded given mildly elevated inflammatory markers, and empiric amoxicillin was initiated. On current admission, he was mildly hypotensive, tachycardic, and subfebrile. Laboratory tests showed markedly elevated C-reactive protein and significant normocytic anemia without overt bleeding. Digital rectal examination was unremarkable. Chest imaging revealed a new left-sided pleural effusion without clear infiltrates. Further history disclosed an emergency visit three weeks earlier for blunt trauma to the left hemiabdomen during a physical assault. Abdominal ultrasound and contrast-enhanced computed tomography at that time showed no acute pathology except a splenic hemangioma. Retrospective review identified a hemoglobin decline during the subsequent visit, temporally associated with abdominal pain. Given unexplained anemia and prior trauma, repeat contrast-enhanced computed tomography demonstrated splenic rupture with active hemorrhage and hemoperitoneum. Emergency splenectomy was performed, and recovery was uncomplicated.

Conclusion

This case highlights the importance of maintaining clinical vigilance following blunt abdominal trauma despite initially negative imaging findings. Unexplained anemia, hemodynamic instability, or evolving symptoms should prompt re-evaluation. In patients with psychiatric comorbidities, symptoms may be misattributed to psychogenic causes, delaying recognition of life-threatening conditions.

Keywords: anemia; delayed splenic rupture; trauma

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WHEN NEUROLOGICAL DEFICIT IS NOT STROKE: MUSHROOM POISONING AS A DIAGNOSTIC TRAP

***Željka Berbić**[1]

Abstract

Mushroom poisoning is an important public health problem. A certain number of cases of intoxication are recorded every year, with clinical presentations ranging from mild gastrointestinal symptoms to severe multiorgan failure and death. The clinical presentation is heterogeneous and depends on the type of toxin, the amount of mushrooms ingested, and the time interval until the moment of reporting to a doctor. Certain toxins can primarily or secondarily affect the CNS and cause encephalopathy, convulsions, or focal neurological deficits. The clinical picture can mimic acute stroke, which is a diagnostic challenge and can cause a delay in establishing the correct diagnosis or even inappropriate use of specific thrombolytic therapy.

Case report

The emergency medicine service (EMS) was called because of a 56-year-old woman who fell and hit her head. The first examination revealed that the patient was unconscious, reacted to painful stimuli, breathing spontaneously, and was hemodynamically stable. Neurological examination at home: facial asymmetry, muscle spasms and myoclonic jerks of the extremities were present. A contusion mark was present on the head. The patient was transported to the emergency department (ED). The daughter stated that the patient had consumed mushrooms that morning. During treatment the patient was somnolent, occasionally opened her eyes and became agitated. Neurological examination at the ED revealed that facial asymmetry was still present in the AG position the extremities fell, the plantar reflex was normal. The examination ruled out an acute neurological event, and the brain CT was normal. The patient was placed on an nasogastric tube (NG) and a urinary catheter (UK), and diazepam, carbomed and infusions were administered. Later, the patient was in full contact, oriented and reconstructed the event.

Conclusion

In patients with a sudden onset of a focal neurological deficit, it is necessary to take a detailed medical history to avoid delaying appropriate treatment and the possibility of incorrect application of therapy.

Keywords: ICV; intoxication; mushrooms

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WHEN THE GUT SPEAKS TO THE HEART: A CASE OF GASTROENTERITIS PRECEDING ACUTE MYOCARDIAL INJURY (AMI)

***Ivana Srzić[1], Darinka Tunjić Pejak[1]**

Abstract

Gastroenteritis is an infection of digestive tract that can promote the development of systemic inflammation and severe dehydration. Acute myocardial injury (AMI) can be triggered by various factors. Severe dehydration can lead to volume depletion, reducing myocardial oxygen supply and increasing blood viscosity. Systemic inflammation response can trigger a hypercoagulabile state and promote coronary artery thrombosis.

Case report

A 39-year old man without prior comorbidity came to emergency department with the chief presentation of gastrointestinal symptoms. The symptoms began four days earlier with abdominal painful cramping and diarrhea. He also experienced sharp, stabbing pain in the chest, occurring exclusively while lying in bed and absent during walking or sitting. The following day he also vomited and was unable to tolerate oral intake. His mother also experienced a two-day episode of gastroenteritis during the same period. Since yesterday, he has had increased difficulty breathing in the supine position, with improvement upon sitting and an upright posture. At the time of examination, he reported no chest discomfort or dyspnea, but appeared weak and clinically dehydrated. On admission normotensive, tachycardic and hypoxemic. Among initial laboratory findings the most notable were significantly elevated values of inflammatory markers and cardio-selective enzymes. He was admitted to the coronary unit as AMI. Echocardiography showed secondary ischemic cardiomyopathy with significantly reduced left ventricular ejection fraction (EF 30%). Treated with diuretic therapy, broad-spectrum antibiotics, and oxygen-therapy. Attempted reperfusion treatment due to occlusion of the left anterior descending coronary artery, which failed. Post-procedurally developed an electrical storm, which was successfully terminated with defibrillation and medications. Due to exhausted options for further treatment transferred by agreement to another hospital for further treatment of heart failure using advanced modalities.

Conclusion

Acute myocardial injury as a result of gastrointestinal infection may be life threatening if not identified and managed promptly. Clinicians need to be aware of this severe complication.

Keywords: acute gastroenteritis; myocardial injury

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WHEN TROPONIN CANNOT WAIT: POINT-OF-CARE TROPONIN AS A CLINICAL SUPPORT TOOL IN SUSPECTED ACUTE CORONARY SYNDROME

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Abstract

Early decision-making at first medical contact in suspected acute coronary syndrome (ACS) frequently occurs before central laboratory results become available. In high-load emergency departments, clinicians must determine monitoring intensity and patient allocation under diagnostic uncertainty. Point-of-care cardiac troponin (POCT) may provide earlier biochemical information, but real-world evidence describing its practical clinical value remains limited.

Methods

We conducted a prospective observational study including 313 adults presenting with suspected ACS during the diagnostic uncertainty phase. Point-of-care troponin testing (Cobas h232) accompanied routine central laboratory testing during early evaluation. Management and disposition were determined by the attending cardiologists according to routine clinical practice based on clinical assessment, electrocardiogram (ECG) findings, and central laboratory troponin levels. Six-week follow-up included coronary revascularization (percutaneous coronary intervention, PCI) or coronary artery bypass grafting, CABG), recurrent anginal symptoms requiring medical evaluation, and mortality, assessed by medical records and telephone contact. Clinically confirmed coronary events consisted of cardiologist-established diagnoses requiring hospital management and/or coronary revascularization during index admission or follow-up.

Results

Among 313 patients, sixty patients developed clinically confirmed coronary events. Point-of-care showed sensitivity 77.8 %, specificity 83.3 %, positive predictive value 87.5 %, negative predictive value 60 %. Early troponin availability provided additional objective information during initial assessment and supported prioritization for cardiology evaluation while definitive decisions remained based on standard laboratory testing.

Conclusion

Point-of-care troponin supports early clinical assessment in suspected ACS by providing rapid biochemical orientation during the waiting phase preceding laboratory confirmation. Its value in emergency care lies in assisting early prioritization rather than replacing standard diagnostic pathways.

Keywords: acute coronary syndrome; emergency; rapid stratification; troponin

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RELATIONSHIP BETWEEN THE PRESENCE OF PTSD AND DEPRESSION SYMPTOMS WITH THE LEVEL OF PSYCHOLOGICAL RESILIENCE AND SOCIAL SUPPORT OF OUT-HOSPITAL EMERGENCY SERVICE WORKERS

***Andreja Domitrović[1], Đorđe Ralić[2], Ivana Dumbović[1]**

Abstract

According to many studies, emergency medical service workers are one of the most vulnerable professions due to the level of stress they experience in their daily work. The factors of this and their connection are multicausal.

Objective

To assess the presence of symptoms of post-traumatic stress disorder, anxiety and depression, the level of psychological resilience, job satisfaction and social support of emergency medical service workers.

Methods

This is a cross-sectional quantitative study. Questionnaires used included: the Posttraumatic Stress Disorder Checklist – Civilian Version (PCL-C) for assessing post-traumatic stress disorder (PTSD), the Connor–Davidson Resilience Scale – 25 item version (CD-RISC 25) for psychological resilience, the Job Satisfaction Scale (Spector, P.E.) for job satisfaction, the Social Support Scale for perceived social support, and the Depression Anxiety Stress Scales – 21 item version (DASS-21) for measuring stress, anxiety, and depression. Around 400 emergency medical service workers from all counties of the Republic of Croatia will participate in the research in the period from January to February by filling out an online form.

Results

They will be presented at the end of the research and published in professional journals.

Conclusion

The results of the study are expected to provide insight into the presence of PTSD, anxiety and depression symptoms and their association with psychological resilience, job satisfaction and social support among emergency medical service workers. The findings could serve as a basis for the development of preventive and intervention programs aimed at preserving mental health and improving working conditions. This could improve the quality of work in emergency medical services in the long term.

Keywords: emergency; PTSD; resilience; satisfaction; support

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SEVERE ACUTE KIDNEY INJURY FROM VITAMIN D TOXICITY DUE TO HIGH-DOSE SUPPLEMENTATION: A CASE REPORT

***Nina Nemčić**[1]

Abstract

High-dose vitamin D supplementation is increasingly used off-label in multiple sclerosis (MS) and carries risks of hypervitaminosis D, hypercalcemia, nephrolithiasis, and acute kidney injury (AKI). We report a case of severe AKI associated with daily cholecalciferol 70,000 IU.

Case report

A 52-year-old male was referred to the emergency department after routine laboratory testing revealed severe AKI (creatinine 602 µmol/L, baseline 136 µmol/L six months earlier). His medical history included hypertension, gout, urethral stricture, and MS (last relapse in 2014). Chronic therapy consisted of febuxostat, losartan, and multiple over-the-counter supplements, including magnesium, chromium picolinate, and cholecalciferol 70,000 IU daily. On admission, he reported headache, polydipsia, polyuria, and constipation, with uncontrolled hypertension. Postrenal obstruction was excluded. Laboratory evaluation demonstrated mild hypercalcemia, hyperphosphatemia, markedly elevated vitamin D levels, and suppressed parathyroid hormone. Heavy metal screening was negative. Imaging revealed bilateral nephrolithiasis without obstruction. Renal biopsy showed tubulointerstitial inflammation with acute tubular injury. All supplements and potentially nephrotoxic medications were discontinued, and intensive hydration was initiated. A tailored diet and patient education were provided. Partial recovery of renal function was observed at discharge after 10 days (creatinine 308 µmol/L), and outpatient nephrology follow-up was arranged.

Conclusion

High-dose vitamin D supplementation may lead to serious renal complications, even in the absence of severe hypercalcemia. Clinicians should maintain a high index of suspicion for supplement-related toxicity in cases of unexplained AKI.

Keywords: AKI; MS; vitamin D toxicity

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SPLEEN AHOY! INADVERTENT SPLENIC INJURY AS A COMPLICATION OF THORACOCENTESIS

***Vedran Vuglić[1], Điđi Delalić[2], Višnja Nesek Adam[2]**

Abstract

Iatrogenic splenic injury secondary to thoracocentesis is a very rare complication, with the incidence of circa 0,8 %, according to the literature. This case report describes a case of inadvertent splenic injury following thoracocentesis resulting in emergency splenectomy.

Case report

A 51-year-old male presented to the emergency department with a chief complaint of fever and dyspnea. The patient's initial SpO_2 was 92 % on room air, therefore supplementary oxygen support was applied. The laboratory workup results showed an elevated white blood cell count with relative neutrophilia and elevated C-reactive protein (CRP), while the chest x-ray demonstrated a left sided pneumonic infiltrate and a pleural effusion. The pleural effusion was confirmed by ultrasound and was suspected to compromise adequate oxygenation, therefore a left sided thoracocentesis was performed by the on-call pulmonologist, using the Seldinger technique with a central line kit. Following the procedure, the patient reported abdominal pain and a hemorrhagic return was noted on the inserted catheter. An emergency computed tomography (CT) of the chest and abdomen was performed, demonstrating iatrogenic splenic injury, with the catheter positioned inside the spleen. An emergency splenectomy was conducted and the patient recovered without further complications following a short stay in the surgical intensive care unit and the abdominal surgery ward.

Conclusion

While iatrogenic splenic injury secondary to thoracocentesis is extremely rare, caution should be exercised to prevent it, including the use of ultrasound-guided technique in real-time for "low-lying" effusions as well as avoiding puncture sites below the 8th intercostal space.

Keywords: iatrogenic disease; pleural effusion; splenectomy; thoracocentesis

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SPONTANEOUS CERVICAL ARTERY DISSECTION AS A HIDDEN CAUSE OF HEADACHE AND NECK PAIN

***Dragana Bekić**[1]

Abstract

Spontaneous cervical artery dissection, involving the internal carotid and vertebral arteries, is an important and frequently overlooked cause of stroke in young adults presenting to the emergency department with seemingly benign head or neck pain. It accounts for 15–25 % of ischaemic strokes in younger patients, yet in the absence of focal neurological deficits it is rarely considered, leading to delayed diagnosis and preventable morbidity. Many patients report days to weeks of unilateral headache or neck pain before evolving transient ischaemic attacks or established stroke, at which point the underlying dissection becomes apparent. Typical clinical features include new-onset unilateral headache that may mimic migraine, cervical or occipital pain, cranial neuropathies, partial Horner syndrome, thunderclap headache and a spectrum of ischaemic stroke syndromes depending on the artery affected. Triggers are often minor trauma, including contact sports, chiropractic or other neck manipulation, sudden hyperflexion or hyperextension of the neck, coughing or sneezing. Emergency physicians should particularly suspect cervical artery dissection in young patients with recent unexplained head or neck pain and a normal initial work-up, including non-contrast head CT and, when indicated, lumbar puncture. In such scenarios, vascular imaging with CT or MR angiography of the head and neck is warranted to evaluate for cervical artery dissection. Management depends on clinical presentation and timing. Patients presenting with acute ischaemic stroke due to cervical artery dissection are generally eligible for standard reperfusion strategies, including intravenous thrombolysis and mechanical thrombectomy, as well as endovascular treatment of tandem occlusions when present. In patients without large-vessel occlusion or with milder presentations, antithrombotic therapy with either anticoagulation or antiplatelet agents is usually recommended for secondary stroke prevention.

Conclusion

Early recognition of cervical artery dissection is crucial for enabling appropriate diagnostic work-up and time-sensitive treatment and to reduce the burden of stroke in otherwise young and neurologically intact patients.

Keywords: dissection; headache; ischaemic stroke; neck pain

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STAPHYLOCOCCAL SEPSIS AND PNEUMONIA SECONDARY TO MEASLES AFTER CHEMICAL PEEL - CASE REPORT

***Ileana Baba**[1]

Abstract

Measles is known to cause transient imunnosuppression, increasing susceptibility to secondary bacterial infection and other complications. Cosmetic procedures such as chemical peel, can disrupt the skin barrier, creating a portal of entry for bacteria in an already weakened immune system. The aim of this paper is to present a rare case in which this factors converged, resulting in sepsis and pneumonia in a patient with measles following a chemical peel.

Case report

A 33-year-old female presented to the Emergency medical service with a high fewer, cough, sore throat, loss of consciousness, accompanied by a rush on the face, chest and hands. Symptoms had been present for five days and developed four days after a chemical facial peel. On admission to the Infectious Diseases Department, patient was febrile (39,3 °C), hypotensive (BP 90/60 mmHg), tachycardic (130 beats/min), hyperemic pharynx, increased respiratory sounds, maculopapular rash on face, chest and hands. The patient had history of migraine, cleft lip and palate surgery and multiple antibiotic allergies- penicillin, gentamicin, trimethoprim-sulfamethoxazole, ciprofloxacin and lincomycin. She reported having measles and varicella in childhood. Chest imaging showed findings consistent with pneumonia. Blood cultures were positive for Staphylococcus epidermidis. The patient met the criteria for sepsis. Management was complicated by multiple antibiotic allergies. Treatment included intravenous fluids, corticosteroids, symptomatic therapy and intravenous antibiotics (vancomycin, metronidazole and ertapenem). In the middle of treatment, the patient's brother presented with a classic clinical picture of measles, confirmed by PCR. Subsequent testing showed positive IgM antibodies in our patient, confirming acute measles infection. The patient showed significant clinical improvement and was discharged after two weeks.

Conclusion

This case shows how viral-induced immunosuppression and skin barrier disruption can cause life-threathening sepsis and pneumonia, highlighting the importance of early recognition and appropriate therapy.

Keywords: chemical peel; measles; pneumonia; sepsis

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STROKE MANAGEMENT IN THE EMERGENCY DEPARTMENT AS PART OF THE ANGELS INITIATIVE PROJECT

***Dijana Osman**[1]

Abstract

The emergency department (ED) of the General Hospital "dr. Tomislav Bardek" Koprivnica has been actively involved in the project since January 2024. During the first year, several meetings were held with Angels consultant Maria Sheverdina, during which the hospital's "stroke team" was formed, consisting of the ED and the Neurology Department. Five simulations were held, based on which new ED protocols and algorithms were created for the best possible care of patients with acute stroke, checklists were created for the purpose of better communication between the ED and the Neurology department. New equipment for the ED was ordered. In order to better care for patients with acute stroke, a Symposium was organized in June 2024. After the symposium, an idea was developed for the education of ED and Emergency medical service (EMS) employees, which resulted in the course "How to recognize an acute stroke", which was also attended by Mateusz Stolarczyk - regional director of the Angels Initiative project.

Case report

By implementing new algorithms in the ED, the stroke team was able to reduce door - to - needle time (DNT) from an initial 85 minutes before the project to the current 35-45 minutes in six months. After the implementation of the new equipment in the ED, thrombolysis was applied for the first time on CT, and the DNT was 24 minutes.

Conclusion

The inclusion of the ED in the project played a key role in reducing DNT, which the Angels Initiative recognized by winning a Platinum Award. Maintaining good practice in the care of acute stroke patients has continued to receive other Gold Awards. In order to continue this trend, it is planned to continue training ED and EMS personnel in collaboration with the Angels Initiative to provide the highest quality care to acute stroke patients so that our region can become an Angels region.

Keywords: Angels Initiative; DNT; education; ED

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DRUG-INDUCED AGRANULOCYTOSIS

***Tomislav Crnčević[1], Vinko Bubić[2], Nina Nemčić[1]**

Case report

The patient was referred to the emergency department by her family physician for fever and a low white blood cell count. She had a known history of hyperthyroidism and was receiving thiamazole therapy. She denied respiratory symptoms and dysuria but reported a sore throat. Clinical examination revealed enlarged tonsils extending beyond the palatoglossal arches, more pronounced on the left side. Laboratory findings showed agranulocytosis (white blood cells 0.3 $\times 10^9$/L) and elevated C-reactive protein levels (220 mg/L). A contrast-enhanced multislice computed tomography (MSCT) of the neck confirmed a left-sided parapharyngeal collection measuring 2.4 × 1 cm. Incision and drainage of the parapharyngeal abscess were performed under local anesthesia, yielding purulent material. The patient was hospitalized and treated with intravenous antibiotics (meropenem, linezolid) and subcutaneous granulocyte-colony stimulating factor. Following therapy, C-reactive protein levels decreased and white blood cell counts increased. During hospitalization, bone marrow aspiration, neck ultrasound, and endocrinology consultation were performed

Conclusion

The patient was discharged afebrile with normal laboratory findings and was prescribed a new therapy per the endocrinologist's recommendation.

Keywords: agranulocytosis; hyperthyroidism; parapharyngeal abscess; thiamazole

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DYSPNEA IS NOT ALWAYS THE LUNGS: DIAGNOSTIC TRAPS IN THE EMERGENCY DEPARTMENT - MINIMIZING MISDIAGNOSIS THROUGH SIMULATION

***Albana Kociaj[1], Eneida Hoxha[1], Elien Gjata[1], Edmond Zaimi[1]**

Abstract

Dyspnea is among the most frequent and diagnostically challenging presentations in the emergency department, accounting for 5–10 % of visits. While commonly attributed to pulmonary causes such as pneumonia, COPD exacerbations, or asthma, breathlessness often reflects cardiac pathology—including heart failure and acute coronary syndrome—as well as anemia, metabolic disturbances , renal dysfunction, neuromuscular disease, and psychiatric conditions. Symptom overlap, comorbidities, and time pressure create a high-risk context for diagnostic error, reported in up to 20 % of cases. Cognitive biases—anchoring, premature closure, attribution bias, and search satisficing—further compromise clinical reasoning, particularly among early trainees. This presentation critically analyzes key diagnostic traps in acute dyspnea and emphasizes a systematic, broadened differential approach beyond pulmonary causes. It explores the integration of point-of-care ultrasound, structured decision-making frameworks, and high-fidelity in situ simulation for first-year emergency medicine trainees' as evidence-based strategies to strengthen diagnostic accuracy, mitigate error, and ultimately improve patient safety and outcomes in emergency care.

Methods

A simulation-based educational intervention was implemented with first-year emergency medicine trainees using high-fidelity in situ scenarios focused on acute dyspnea. Scenarios incorporated complex non-pulmonary etiologies and required systematic assessment supported by point-of-care ultrasound. Pre- and post-simulation evaluations measured diagnostic accuracy, differential breadth, and cognitive bias recognition.

Results

Participants demonstrated improved identification of non-pulmonary causes of dyspnea, expanded differential diagnoses, and reduced anchoring tendencies. Use of structured clinical frameworks and ultrasound integration significantly enhanced diagnostic confidence and reasoning processes.

Conclusion

Diagnostic error in dyspnea is frequently driven by cognitive bias and premature pulmonary attribution. Simulation-based training combined with systematic assessment strategies and point-of-care ultrasound improves diagnostic accuracy, strengthens clinical reasoning, and promotes safer emergency care. Early educational interventions may play a critical role in reducing morbidity associated with misdiagnosis.

Keywords: dyspnea; emergency medicine errors; simulation

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EMERGENCY DEPARTMENT HEART FAILURE PHARMACOTHERAPY: UNDERUSE OF GUIDELINE-DIRECTED THERAPY AND MISSED OPPORTUNITIES FOR OPTIMIZATION

***Blanka Anna Belavić[1], Ivan Gornik[2]**

Abstract

Heart failure (HF) is a frequent cause of emergency department (ED) visits, yet guideline-directed medical therapy (GDMT) is often underused or insufficiently optimized. We aimed to describe HF pharmacotherapy patterns in ED patients and identify opportunities to improve GDMT implementation.

Methods

We analysed adult (>18 y) patients with HF presenting to the ED, regardless of primary complaint. For all patients we collected demographic data, chief complaint, laboratory values, pre-ED medication, and ED-recommended therapy changes.

Results

We included 476 patients (median age 79 years, 188 female); 274 (57.6 %) presented with cardiac symptoms. Heart Failure (HF) was first diagnosed in 67 (14.1 %) patients, representing 33.1 % of those with cardiac complaints. Among patients with previously known Heart Failure, diuretics were the most frequently prescribed (323, 79.8 %), followed by beta-blockers (314, 77.5 %), renin–angiotensin–aldosterone system (RAAS) inhibitors (260, 64.2 %), mineralocorticoid receptor antagonists (MRAs) (167, 41.3 %), and sodium–glucose cotransporter 2 (SGLT2) inhibitors (127, 31.4 %). Most previously diagnosed Heart Failure patients had no therapy change, while most newly diagnosed and discharged patients (84.2 %) received new prescriptions. In both groups, the most frequent recommendation was diuretic dose increase (81.7 %). Newly diagnosed Heart Failure patients were started on beta-blockers in 42.1 %, RAAS inhibitors in 26.3%, SGLT2 inhibitors in 26.3 %, and MRAs in 15.8 %. In previously diagnosed Heart Failure, MRAs were added in 12.2 %, and any other drug class in less than 3 % of cases. Atrial Fibrillation (AF) was documented in 261 (55.1 %) patients; 59 (22.6 %) were not receiving anticoagulation, and anticoagulation was initiated in only 11 (18.6 %) of them.

Conclusion

In this elderly HF cohort, RAAS inhibitors, MRAs, SGLT2 inhibitors and anticoagulation in atrial fibrillation were underused, and ED visits rarely prompted therapy optimization, indicating missed opportunities for standardized GDMT initiation and intensification. These findings underscore the need for targeted education and structured, guideline-based protocols in the ED to support consistent GDMT implementation and improve long term outcomes for patients with heart failure.

Keywords: goal directed therapy; heart failure

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EMERGENCY DEPARTMENT VISITS OF HEMODIALYSIS PATIENTS

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Abstract

Chronic kidney disease (CKD) affects approximately 10 % of the adult population and represents a growing public health concern. Patients with end-stage renal disease on chronic hemodialysis carry a high burden of comorbidities and frequently require acute medical care. International literature consistently identifies cardiovascular disease, infections, and vascular access complications as the leading reasons for emergency department (ED) visits in this population. The aim of this study was to analyse the reasons for ED presentations and hospitalisation rates among chronic dialysis patients.

Methods

A retrospective analysis was conducted of all ED visits by adult chronic dialysis patients at the Emergency Department of Clinical hospital "Sveti Duh", Zagreb, Croatia, between January 2015 and December 2025.

Results

Of total ED visits, 0.4 % involved chronic dialysis patients — 55 % male, mean age 68 years, 70 % older than 65. Nearly half (45 %) were referred by their dialysis facility. Over one-third (40 %) of visits resulted in hospitalisation. Leading causes of admission were cardiovascular disease (35 %), vascular access complications (15 %), infections (14 %), and volume overload (14 %). Among non-hospitalised patients, respiratory infections (31%) and hypertension (25 %) were the most prevalent conditions. Notably, 22 % of all visits occurred during the first year of dialysis, primarily due to vascular access problems and hypertension, partially reflecting the delayed establishment of functional arteriovenous fistulas. Dialysis patients have a significantly higher hospitalisation rate (60 %) and in hospital mortality (5%) compared with the general population.

Conclusion

Our results are consistent with international evidence and confirm that the early establishment of functional AV fistulas, intensified nephrology and cardiology care, and systematic patient education in the earlier stages of CKD can reduce ED utilisation and improve outcomes for ESRD patients.

Keywords: chronic kidney disease; emergency department

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EMPIRICAL USE OF ANTIBIOTICS IN SEPSIS - CHOOSE WISELY

***Ivan Brdar[1], Radmila Majhen Ujević[2]**

Abstract

Sepsis is a life-threatening organ dysfunction, with mortality over 40 % in septic shock. Initial care procedures include collecting microbiological samples and giving broad-spectrum antibiotics. This paper provides an insight into current knowledge on empirical antimicrobial treatment. The use of appropriate antibiotic therapy poses challenges. Sepsis is a clinical diagnosis. The initial recognition of these patients is crucial. Guidelines suggest that antibiotics should be used within the first hour. Each hour of delay causes a significant increase in mortality, especially in septic shock. If there are no signs of shock, the time frame extends to three hours. Unjustified antibiotic use is linked to side effects. The wrong antibiotic choice also reduces survival. The antibiotic depends on the suspected source, anamnestic data, comorbidities, and local resistance patterns. The respiratory system (43 %) and urinary tract (16 %) are the most common sources of infection. Broad-spectrum carbapenems or extended-spectrum penicillin/β-lactamase inhibitors are recommended as initial therapy. Third- or higher-generation cephalosporins may also be used. Broad-spectrum therapy should cover both gram-positive and gram-negative bacteria. If there is high suspicion for multidrug-resistant pathogens, two antibiotic classes are recommended to cover gram-negative bacteria. For respiratory infections, the first choice is therapy with a beta-lactam and a macrolide, or, as a second option, monotherapy with a respiratory fluoroquinolone (levofloxacin or moxifloxacin). Suspected nosocomial infection calls for choosing options such as piperacillin/tazobactam or levofloxacin plus linezolid. For high suspicion of MRSA sepsis, add vancomycin or linezolid.

Conclusion

In summary, antibiotic therapy is a key part of the initial treatment of patients with sepsis, which begins in the emergency department. To ensure this approach is effective, it is necessary to have a clear, correct clinical understanding of the patient's condition to consider possible pathogens and local resistance data.

Keywords: antibiotic; emergency medicine; sepsis

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EMS RESPONSE TO EARTHQUAKE

***Branka Bardak[1], Jelena Kovačević[1], Marijan Bašić[1]**

Abstract

Croatia is one of the countries that has had earthquakes on its territory and which still has a certain risk of their recurrence. Dealing with such a disaster can last for days, and sometimes months. During this natural disaster, emergency medical service (EMS) is faced with organizational, coordination and communication challenges. EMS is also faced with specific medical problems that are rarely encountered in everyday work. The success of the response to this disaster depends, among other things, on good preparation of EMS. This overview shows what problems EMS encounters during an earthquake as well as possible preliminary actions in terms of preparing the EMS response to this disaster.

Conclusion

EMS preparation should include a plan for organization and communication during an earthquake as well as educating staff about possible medical challenges.

Keywords: earthquake; EMS

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EXPOSING RADIOLOGICAL MYTHS – ORDER A SCAN WITHOUT WORRY

***Nikola Čolović[1], Bojana Radulović[1], Ivan Gornik[1]**

Abstract

Radiological diagnostics represents an integral component of patient care in the emergency department and are frequently essential for accurate diagnosis. Fear has long accompanied radiological practice—first of ionizing radiation, then of contrast-induced nephropathy, and contrast agent "allergy." Yet contemporary evidence challenges much of these dogmas. The concept of contrast nephropathy arose in the era of hyperosmolar agents, before the standards of evidence-based medicine were established. Modern iso-osmolar and low-osmolar contrast agents have not been shown to independently cause acute kidney injury, increase dialysis rates, or raise mortality. Across large studies and meta-analyses, post-contrast creatinine fluctuations mirror those seen in unexposed populations, with no consistent evidence of harm. Likewise, a true immune-mediated contrast allergy has not been definitively demonstrated. Most adverse reactions are non–immune-mediated and clinically manageable. Physiological and vasovagal responses may occur, particularly with higher osmolar loads, but are predictable and dose dependent. Pregnancy remains another area of disproportionate concern. When clinically indicated, imaging should not be withheld. Fetal risk is negligible at doses below 100 mGy, and most diagnostic procedures fall well within this range. Non-ionizing modalities should be preferred when appropriate, yet ionizing imaging may be used judiciously without significant risk.

Conclusion

Radiological decision-making must be guided by data, not dogma. Evidence supports the safe and rational use of contrast agents and ionizing radiation when clinically justified.

Keywords: allergy; contrast; nephropathy; pregnancy; radiology

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EXTRACORPOREAL MEMBRANE OXYGENATION IN EMERGENCY MEDICINE: INDICATIONS, USE, AND INSTITUTIONAL EXPERIENCE

***Maja Materljan[1], Ivanka Jurica[1], Dijana Dumić[1], Nataša Mavrinac[1], Mirjana Maras[1], Ivana Rosić[1], Mate Lerga[1]**

Abstract

Extracorporeal membrane oxygenation (ECMO) is an advanced rescue therapy used in emergency settings. It is used for patients with cardiac arrest or severe heart and lung failure who do not respond to standard treatment. In emergency medicine, veno-arterial extracorporeal membrane oxygenation (ECMO) is most often used as extracorporeal cardiopulmonary resuscitation (ECPR). The primary goal of ECMO in emergency medicine is to provide a limited but crutial period of time during which physicians can identify and treat reversible causes of circulatory and respiratory collapse such as acute myocardial infarction, massive pulmonary embolism, severe intoxication, hypothermia. Early identification of appropriate patients, immediate high-quality CPR, rapid team activation, rapid ECMO initiation (ideally within 60 minutes after cardiac arrest), are key factors influencing survival and neurological outcome. Currently, there are no published randomized controlled trials comparing outcomes between patients treated with ECPR and conventional CPR (CCPR), although a benefit of ECPR is observed in appropriately selected patient and rapid ECMO initiation. In those patients, good neurological outcomes are also often reported. According to previously said, ECMO has been incorporated into the latest ERC guidelines (published in 2025).

Conclusion

The use of ECMO in emergency departments requires good multidisciplinary collaboration, consistent training, and clearly defined institutional protocols. We present current literature and guidelines regarding the use of ECMO in emergency medicine with a focus on practical algorithms. We also present our institutional experience based on case series from 2018 to the present (18 patients), with increasing number of patients in the last two years, corresponding with the establishment of 24/7 on-site emergency medicine specialists.

Keywords: ECMO; ECPR; emergency department

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FALLS IN THE EMERGENCY DEPARTMENT: A CLINICAL SYMPTOM, NOT A DIAGNOSIS

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Abstract

Falls are a frequent reason for presentation to the emergency department (ED), particularly among elderly patients. In daily practice, falls are often approached as isolated traumatic events rather than as clinical manifestations of underlying acute or chronic conditions. This symptom-based framing may contribute to incomplete evaluation and missed diagnoses with potentially serious consequences.

Aim

To emphasize falls as a clinical symptom rather than a diagnosis in the emergency department and to highlight the importance of systematic evaluation to identify underlying medical causes.

Clinical Perspective

In the ED, falls may represent the first manifestation of conditions such as infection, dehydration, hypotension, cardiac arrhythmias, metabolic disturbances, medication effects, or acute neurological events. In elderly patients, atypical presentations and limited symptom reporting may further obscure the underlying cause. Focusing exclusively on trauma assessment risks overlooking reversible or life-threatening medical triggers.

Clinical Implications

A comprehensive, symptom-oriented approach to patients presenting with falls allows earlier identification of underlying pathology and more appropriate management decisions. Evaluating falls within a broader clinical context, including vital signs, medication review, mental status, and basic laboratory assessment, can prevent diagnostic delays, reduce complications, and improve patient safety.

Conclusion

Falls in the emergency department should be regarded as warning signs of potential underlying illness rather than standalone diagnoses. Shifting from a trauma-centered to a symptom-based clinical approach is essential, particularly in elderly and multimorbid patients. Recognizing falls as a clinical manifestation may improve diagnostic accuracy and outcomes in emergency care.

Keywords: diagnosis; emergency; falls; geriatrics; safety

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FROM ANAPHYLACTIC SHOCK TO SILENT TROPONIN ELEVATION: SUSPECTED KOUNIS SYNDROME AFTER BEE STING

***Drinko Granić[1], Nora Knez[1], Tomislav Knotek[2]**

Abstract

Kounis syndrome (allergic acute coronary syndrome) is an under-recognized cause of acute myocardial injury during anaphylaxis. A US nationwide inpatient analysis found that acute coronary syndrome coexisted with allergic or anaphylactic reactions in approximately 1.1 % of hospitalized patients, with an all-cause mortality rate of 7.0 %, though true prevalence is likely higher due to systematic underdiagnosis.

Case report

A 79-year-old man sustained multiple bee stings and collapsed shortly afterward. Ground emergency medical services found him hypotensive (BP 65/45 mmHg), hypoxemic (SpO2 90 %). He received intravenous Plasma-Lyte 500 mL, with clinical improvement. During helicopter emergency medical services transport (HHMS) his Glasgow coma score (GCS) improved to 15, blood pressure stabilized to 115/70 mmHg, and oxygen saturation increased from 88 % to 95 % on 2 L/min oxygen via nasal cannula. On hospital arrival, he was hemodynamically stable (BP 120/80 mmHg, HR 65/min) and remained free of chest pain throughout evaluation. Serial ECGs demonstrated sinus rhythm with approximately 1 mm ST-segment elevation in septal leads, without dynamic ischemic changes. High-sensitivity cardiac troponin I (hs-cTnI) increased from 43 ng/L to 333 ng/L and then 307 ng/L. Lactate was initially elevated (5.06 mmol/L) and normalized during observation. Cardiology consultation did not indicate urgent invasive coronary evaluation. Given the clear temporal relationship with anaphylactic shock, significant hs-cTnI rise, and absence of angina or evolving ECG changes, suspected Kounis syndrome was considered the leading diagnosis, while type 2 myocardial injury due to hypoperfusion remained an alternative explanation.

Conclusion

In this patient, the absence of anginal symptoms, lack of dynamic ECG evolution, and rapid troponin plateau favored allergic coronary vasospasm over plaque-related ischemia. Importantly, epinephrine — the cornerstone of anaphylaxis treatment — may paradoxically worsen coronary vasospasm, creating a therapeutic dilemma when allergic coronary involvement is suspected. Cardiac biomarker screening and ECG assessment should be considered in all patients with anaphylactic shock.

Keywords: anaphylaxis; bee sting; Kounis syndrome

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FROM PHARYNGITIS TO MODS: RAPID PROGRESSION OF INVASIVE STREPTOCOCCUS PYOGENES INFECTION

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Abstract

Streptococcus pyogenes (group A streptococcus, GAS) commonly causes upper respiratory tract infections. Although usually self-limiting, invasive GAS disease may rapidly progress to sepsis and multiple organ dysfunction syndrome (MODS), even in previously healthy individuals. Early recognition in emergency settings is crucial.

Case report

A previously healthy 28-year-old male was admitted with high-grade fever (39.2 °C) lasting several days, sore throat, vomiting, and left-sided pleuritic chest pain radiating to the shoulder. He had received azithromycin for presumed streptococcal tonsillopharyngitis due to reported penicillin allergy. On admission, he was tachypneic but normotensive. Chest radiography revealed left pleural effusion. Multislice computed tomography (MSCT) of the thorax confirmed pleural effusion and pericardial effusion consistent with pericarditis. Laboratory findings showed markedly elevated C-reactive protein (485 mg/L), thrombocytopenia (76×10^9/L), elevated D-dimer (>4400 mcg/L), lactate 2.9 mmol/L, and acute kidney injury (creatinine 225 µmol/L). Findings were consistent with systemic inflammatory response and coagulopathy. Blood cultures grew S. pyogenes. The patient fulfilled Sepsis-3 criteria for sepsis with acute kidney injury and coagulation abnormalities consistent with MODS. Computed tomography pulmonary angiography and venous Doppler ultrasound excluded thromboembolism. Empiric intravenous therapy with meropenem and clindamycin was initiated; clindamycin was included to suppress streptococcal toxin production. Pleural drainage was performed. During 24 days of hospitalization, gradual clinical and laboratory improvement occurred, including recovery of renal function and normalization of coagulation parameters. The patient was discharged in stable condition.

Conclusion

This case highlights the potential for rapid progression of invasive GAS infection from pharyngitis to sepsis with MODS in a young, otherwise healthy patient. High clinical suspicion, early diagnostics, and prompt aggressive management are essential for favorable outcomes.

Keywords: multiple organ failure; streptococcus pyogenes

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FROM PROTOCOL TO FLOW: REAL-WORLD DELIVERABILITY OF ECPR PATHWAYS IN SHOCKABLE OHCA

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Abstract

Extracorporeal cardiopulmonary resuscitation (ECPR) for refractory out-of-hospital cardiac arrest (OHCA) is increasingly discussed as a system-level intervention. In the absence of reliable delivery, outcome comparisons risk reflecting logistics rather than treatment effect. We evaluated real-world deliverability of ECPR pathways in refractory shockable OHCA.

Methods

We performed an implementation-focused systematic review of adult (≥18 years) refractory OHCA with an initial shockable rhythm (ventricular fibrillation/ventricular tachycardia.VF/VT) managed via a prespecified ECPR pathway from prehospital activation to in-hospital cannulation. Database searching identified 190 records; after deduplication, 172 unique records underwent title/abstract screening. Forty-one full texts were sought; 40 were assessed (1 pending retrieval), and 11 studies were included. The primary outcome was ECPR dose, defined as extracorporeal flow achieved using the correct denominator (RCTs: flow/allocated to ECPR; observational/registry: flow/selected or transported for ECPR). Secondary outcomes included time-to-flow intervals, harmonized failure points (ROSC before cannulation; logistic failure; futility/contraindication after arrival; procedural failure; cessation/withdrawal), feasibility KPIs, and reported major safety events. Risk of bias was assessed using RoB 2 for RCTs and a light ROBINS-I approach for non-randomized designs.

Results

Across 10/11 studies with extractable dose denominators, ECPR dose ranged from 38.1 % to 100 % (median 71.7 %; descriptive aggregate 301/452 [66.6 %]). Success among attempted cannulations remained high (86.5 %–100 %), indicating that the main attrition occurs upstream during pre-cannulation decision gates and pathway termination. Where reported (5/11 studies), time-to-flow central values ranged from 39 to 84 minutes (median 69); interval definitions were heterogeneous. Non-delivery was commonly attributed to ROSC before cannulation, post-arrival futility/contraindication gates, and procedural failure among attempted cases; logistical failure was infrequently reported.

Conclusion

ECPR is deliverable but not guaranteed, even in established pathways. Programs should benchmark readiness using three KPIs: dose (flow/denominator), time-to-flow, and failure-point distribution before expanding indications or scale.

Keywords: ECPR; out-of hospital cardiac arrest

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GASTRIC ISCHAEMIA: RARE, OVERLOOKED AND DEADLY

***Ena Vučković[1], Jasmin Hamzić[2]**

Abstract

Gastric ischaemia, although rare because of stomach's specific, collateral-rich blood supply, is an under-recognised and serious diagnosis associated with poor prognosis.

Case report

A 64-year-old woman with multiple comorbidities presented to the emergency department with three-day history of severe sharp chest and epigastric pain. Other complaints were generalised malaise, nausea and vomiting on one occasion. Laboratory findings included severe microcytic anaemia and warfarin overdose. Upper gastrointestinal (GI) endoscopy was undertaken which excluded an active GI haemorrhage and raised suspicion of gastric ischaemia which was later confirmed by findings of oedematous, hypovascular stomach wall with pneumatosis on MSCT angiography. Supportive measures including packed red blood cells and fresh frozen plasma transfusions, crystalloid infusions, parenteral proton pump inhibitors, empiric ertapenem and nasogastric tube placement were initiated in the emergency department. The patient was admitted to gastroenterology ward where aforementioned measures were continued until discharge after 10 days.

Conclusion

Although rare, gastric ischaemia has a poor prognosis and high mortality, and is associated with many conditions such as systemic hypotension, thromboembolism, vasculitis or acute gastric dilatation, and some common risk factors including hypertension, diabetes, atherosclerosis and smoking. The key to successful management of gastric ischaemia and prevention of fatal complications is awareness of this rare diagnosis and its early recognition.

Keywords: anaemia; angiography; endoscopy; gastric ischaemia

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GENDER-RELATED DIFFERENCES IN ETIOPATHOGENESIS OF CORONARY ARTERY DISEASE

***Roko Habek**[1]

Abstract

Cardiovascular disease is the leading cause of morbidity and mortality worldwide. Although women generally have a lower prevalence than men, several studies have shown that after an acute cardiovascular event, women have a greater death rate and a worse prognosis. Cardiovascular morbidity and death in women is a major concern that is still under-recognition and untreated. Consideration of gender differences is important for preventing, diagnosing, treating, and managing cardiovascular disease. Recent evidence has emerged that recognizes new, potentially independent cardiovascular risk factors exclusive to women. The objective of research: differences in cardiovascular disease according to gender, epidemiology, clinical manifestation, distribution of obstructive coronary lesions, non-obstructive coronary lesions, a specialty of cardiovascular disease during reproductive age, pregnancy and menopause, an outcome of treatment, reveal new knowledge about the possible pathophysiological mechanism underlying gender differences in cardiovascular disease.

Methods

Review of recent literature on coronary artery disease topics according to gender.

Conclusion

Clear evidence indicates that sex and gender-related factors interact in generating differences in cardiovascular disease outcomes in women and men. Women are more likely to develop coronary artery disease a decade later than men; they usually have more adverse outcomes, are twice as likely to die of a first myocardial infarction and have less favorable long-term survival as compared with men. Also, the prevalence of acute coronary syndrome in women is higher than in men because of plaque erosion, spontaneous coronary artery dissection, and non-obstructive coronary artery disease; they are underdiagnosed and undertreated. Recognizing and treating novelrisk factors in women, which include systemic inflammatory disorders and pregnancy-related factors, could improve the outcome of women.

Keywords: coronary artery disease; gender-related differences

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GIANT TYPE IV PARAOESOPHAGEAL HERNIA PRESENTING AS ISOLATED PROGRESSIVE DYSPNEA

***Hugo Mađarić[1], Nina Lovrić[2], Martina Pavletić[2], Nataša Mavrinac[2]**

Abstract

Progressive dyspnea in elderly patients is most often attributed to cardiac or pulmonary disease. Structural thoracic causes are rarely considered in the absence of gastrointestinal symptoms. Giant type IV paraoesophageal hernias are uncommon and may present atypically, posing a diagnostic challenge.

Case report

A 69-year-old woman presented to the emergency department with progressive worsening exertional dyspnea evolving over several months. Initially symptomatic when walking uphill, she later developed shortness of breath during minimal exertion. She denied chest pain, orthopnea, palpitations, nausea, vomiting, abdominal pain, reflux symptoms, or changes in bowel habits. Her medical history included hypertensive heart disease, and a sliding hiatal hernia diagnosed a decade earlier. At presentation, she was hemodynamically stable and eupneic at rest. Cardiovascular findings were unremarkable with no sign of ischemia or abnormalities in ECG. Laboratory tests, inflammatory markers, and arterial blood gas analysis were all within reference ranges making pulmonary embolism, acute coronary syndrome, and heart failure unlikely. However, auscultation revealed markedly diminished breath sounds over the right mid and lower lung fields. Chest radiography showed a large intrathoracic air-fluid level occupying the right hemithorax. Computed tomography confirmed a giant type IV paraoesophageal hernia containing the entire stomach (rotated 180°) and segments of colon, with an 11x6 cm diaphragmatic defect but no signs of incarceration, obstruction, or ischemia. The patient underwent surgical repair with hiatoplasty and fundoplication.

Conclusion

This case highlights an atypical presentation of a giant type IV paraesophageal hernia manifesting solely as progressive dyspnoea, without gastrointestinal or laboratory abnormalities. In elderly patients, such a presentation is highly unusual, as clinicians typically first consider cardiopulmonary causes such as heart failure od pulmonary embolism. The case underscores the importance of maintaining a broad differential diagnosis and assessing the patient as a whole, rather than focusing solely on the most common organ systems.

Keywords: dyspnoea; paraesophagela hernia

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HEADACHE: WHEN THE APPARENTLY BENIGN BECOMES SERIOUS – A CASE REPORT

***Dijana Maslarda[1], Laura Nenadić[1], Dubravka Ivanić[1]**

Abstract

Headache is one of the most common reasons for presentation to the emergency department and is most often of benign origin. However, a small proportion of patients may have potentially life-threatening conditions such as subarachnoid or other intracranial hemorrhages. In such cases, a high level of clinical suspicion is crucial, especially in patients presenting with sudden-onset headache accompanied by vomiting, altered consciousness, or amnesia.

Case report

A 48-year-old female presented to the emergency department with a severe constricting headache, worsened by changes in body position, which had started the previous day. Her medical history was significant for arterial hypertension. She had taken ibuprofen without symptom relief. At triage, she denied trauma, vomiting, or loss of consciousness. She was hemodynamically stable, afebrile, with a normal Glasgow Coma Scale score and no focal neurological deficits. Heteroanamnesis revealed that the patient had fallen and struck her head the previous day, followed by vomiting and a brief loss of consciousness on the day of presentation. The patient was amnestic for these events. Given the headache characteristics, vomiting, and unclear trauma history, a multislice computed tomography (MSCT) scan of the brain was performed. Imaging revealed post-traumatic subarachnoid hemorrhage with frontal and temporal contusional hemorrhages, a small subdural hematoma, and an occipital bone fracture. The patient was admitted to the intensive care unit, where conservative management and close monitoring by a multidisciplinary team were initiated. During hospitalization, she remained clinically stable without progression of neurological deficits.

Conclusion

This case highlights that an apparently benign headache may be a manifestation of serious intracranial hemorrhage. Amnesia, vomiting, and sudden severe headache warrant extended diagnostic evaluation even in clinically stable patients without focal neurological deficits. Early recognition of red flags is essential to prevent diagnostic delay and to improve patient outcomes.

Keywords: emergency department; headache; subarachnoid hemorrhage

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HEALTH CARE DISPARITIES AND SHORT-TERM OUTCOMES FOR PATIENTS WITH AORTIC DISEASE IN JERUSALEM

***Asher Taragin[1], Noam Noam Mazover[1], Avraham Alport[2]**

Abstract

Understanding demographic and clinical factors affecting patient outcomes is essential for optimizing care and resource allocation. This study examines mortality and healthcare disparities among patients with aortic disease in Jerusalem.

Methods

A retrospective cohort analysis was conducted on 304 patients. Variables included sex, age, geographic location, ethnic origin, smoking status, and mortality. Statistical analyses employed chi-square tests, independent t-tests, and descriptive statistics to explore associations between these factors and survival.

Results

The cohort included 74 % males and 26 % females, with a mean age of 75.6 years (±16.6). Overall mortality was 14.5 % (n=44). Females had higher mortality than males (21.5 % vs. 12.0 %, p=0.039). Mortality varied by location, highest outside Jerusalem (17.1 %) and lowest in West Jerusalem (12.5 %), though not statistically significant (p=0.552). Ethnic origin showed no significant effect (p=0.953). Deceased patients were older (79.4 ± 18.3) than survivors (75.0 ± 16.2, p=0.049), with a median age of 84 vs. 77. Smoking was associated with increased mortality (p<0.001). Clinical diagnoses included aneurysm (62.3 %), dissection (22.4 %), and rupture (5.4 %), which were significantly linked to adverse outcomes (p<0.001). Subgroup analyses revealed no major differences between aortic pathology types, except a trend for heart rate (p=0.055). Among dissection patients, heart rate (p=0.021) and oxygen saturation (p=0.016) were significantly associated with in-hospital mortality, emphasizing early vital sign monitoring. Emergency department stay time was not significantly linked to mortality (overall p=0.419; dissection p=0.318).

Conclusion

Age and sex are key predictors of mortality, with older patients and females at higher risk. Geographic and ethnic factors did not significantly influence outcomes. These findings underscore the importance of age-based risk stratification and early clinical monitoring to guide targeted interventions for high-risk patients with aortic disease.

Keywords: aortic disease; risk factor; mortality

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HIGH-FLOW NASAL OXYGEN THERAPY AS A NON-INVASIVE RESPIRATORY SUPPORT IN THE EMERGENCY DEPARTMENT: FROM EVIDENCE TO PRACTICE

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Abstract

We will present a review of the current literature and up-to-date guidelines high-flow nasal cannula (HFNC) therapy in the emergency departemt (ED), as well as our centre experience in the management of patients with acute respiratory failure (ARF) treated with HFNC.

Acute respiratory failure is one of the most frequent causes of emergency department visits, which includes acute exacerbations of pre-existing heart failure, chronic obstructive pulmonary disease (COPD) and de novo acute hypoxemic respiratory failure (AHRF). Consequently, the implementation of non-invasive respiratory support (NIRS) has become a standard intervention in the ED. High-flow nasal cannula is an effective form of NIRS that generates flow rates of up to 50–60 L/min of heated and humidified gas, promoting a washout effect in the upper airways, reducing deadspace, CO2 rebreathing and providing a positive airway pressure (PAP), thereby decreasing the work of breathing. Additionally, an FiO_2 of up to 100 % can be achieved by supplemental oxygen. Current clinical practice guidelines from the European Respiratory Society (ERS), the European Society of Intensive Care Medicine (ESICM) and the American College of Physicians (ACP) support the use of HFNC over conventional oxygen therapy (COT) in adults of AHRF. Despite findings suggesting that HFNC is non inferior to non-invasive ventilation (NIV) and is not associated with a higher risk of treatment failure during the initial management of patients with ARF, these recommendations are not based on high-quality evidence and therefore require further validation. While emerging data suggest that HFNC therapy provides clinical benefits in hypercapnic respiratory failure, there is insufficient evidence directly comparing its efficacy to non-invasive ventilation as a primary intervention for COPD patients presenting with mild-to-moderate acidosis and further clinical trials are required to establish its routine clinical use.

Keywords: ARF; HFNO; respiratory support

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HOSPITAL EMERGENCY CARE AND CHRONIC CORONARY SYNDROME

***Vedrana Baraban[1], Nika Srb[2], Ninoslava Vonić[3]**

Abstract

Chronic coronary syndrome represents a significant public health problem and burden on all levels of healthcare, especially emergency services. This is due to the large proportion of patients and the lack of optimal therapeutic solutions, despite significant progress in understanding the pathophysiology of this disease. The 2019 ESC guidelines introduce for the first time the concept of chronic coronary syndrome (CCS) as a more comprehensive, diagnostically and therapeutically demanding clinical entity than the previously used term stable angina pectoris. This clinical entity represents the clinical presentation of coronary artery disease (CAD) that occurs during a stable period of coronary disease, after or before acute coronary syndrome. The latest ESC guidelines (2024) distinguish 5 categories of CCS: 1.) proven coronary disease and angina during exertion, 2.) angina (vasospasm or microvascular disease/endothelial dysfunction) without obstructive coronary disease (angina with non-obstructive coronary arteries/ischemia with non-obstructive coronary arteries, ANOCA/INOCA), 3.) patients with stable symptoms after ACS or revascularization, 4.) patients with stable symptoms and heart failure of ischemic or cardiometabolic etiology and 5.) asymptomatic category in which CAD was detected due to other indications. The task of the hospital emergency care is, in case of patients returning with shortness of breath and chest pain, to first exclude acute coronary and thoracic outlet syndrome then, considering the results of the treatment, to take into account the existence of CCS, especially in risk groups of patients and the above-mentioned entities confirmed by earlier treatment that lead to this chronic form of coronary disease.

Conclusion

The treatment and hospitalization of patients with CCS remains in cooperation with the cardiology department, following the latest guidelines from 2024. However, despite significant progress in the analysis of the pathophysiological mechanisms of occurrence, there is a need for additional clinical research that would optimize current therapy and improve invasive coronary treatment with the aim of complete and long-term stabilization of CCS.

Keywords: chronic coronary syndrome; emergency medicine; ischemia

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HOW SAFE IS MY EMERGENCY PATIENT?

***Tamara Murselović**[1]

Abstract

Patient safety in the emergency department (ED) is a major concern because this high pressure setting combines crowded conditions, rapid decision making, and frequent handovers, all of which increase the risk of error. Common threats include diagnostic delays, communication failures, and especially medication errors, which affect over one third of ED patients in some studies. Crowding, multitasking, and interruptions further raise the likelihood of patient misidentification and wrong patient orders. Medication safety is a central focus of ED safety strategies. Systematic reviews show many errors occur during prescribing and administration, with dosing mistakes and wrong frequency particularly frequent. Involving clinical pharmacists at the point of care, standardizing order sets, and using electronic prescribing with decision support can help intercept these errors before they reach patients. Clear allergy checks, weight based dosing protocols, and barcode verification provide additional safeguards. Structured tools and culture change are critical for safer ER care. Expert developed emergency department safety checklists define key tasks at triage, assessment, treatment, and disposition to prevent "never events" such as wrong patient treatment, missed vital sign abnormalities, and equipment failures.

Conclusion

Team training that emphasizes communication, leadership, situational awareness, and effective workload distribution improves how staff respond to complex or deteriorating patients. Underpinning all these measures is a strong safety culture that encourages reporting, learning from incidents, and continuous improvement, enabling the ED to fulfill its role as a reliable safety net for acutely ill and injured patients.

Keywords: communication; emergency medicine; patient safety

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HOW TO CLEANSE YOUR CRYSTALS?

***Ivona Peter**[1]

Abstract

In the emergency department, we encounter cases of abdominal pain ranging from mild discomfort to acute conditions on a daily basis.

Case report

March 2025 was no exception at the KBC Osijek emergency departement. At 8 pm, a 54-year-old patient presented to our infirmary with lower abdominal pain, difficulty with micturation, dysuria and macrohaematuria. As per standard procedure, we initiated a medical history, which revealed that the patient had rightsided nephrolithiasis and had a JJ stent in place since 2017 that had not been exchanged. Subsequently, a physical examination was conducted, during which suprapubic tumefaction was identified. Following this, the patient was referred for an X-ray, and we awaited the results. The results showed that the JJ stent has crustified. The patient declined inpatient admission on that day and was subsequently discharged with a prescription for antibiotics. A follow-up appointment with a urologist has been scheduled for March 17, 2025. A pulmonologist and an anesthesiologist evaluated the patient for surgical clearance, and the encrusted JJ stent was subsequently managed with lithotripsy and replaced. He was discharged with a scheduled CT scan of the abdomen, which he completed, but he did not attend the follow-up appointment.

Conclusion

This case report details a common presentation of lower abdominal pain with an unusual etiology. I will emphasize the critical importance of timely and meticulous JJ stent exchanges, alongside a discussion on appropriate management strategies for crystalline deposits in such scenarios (or in other words, how to cleanse your crystals).

Keywords: abdominal pain; incrustation; JJ stent

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HYPERKALEMIA-INDUCED BRUGADA PHENOCOPY: A CASE REPORT

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Abstract

Brugada syndrome is an inherited cardiac channelopathy associated with sudden cardiac death in patients without structural heart disease. Type 1 Brugada pattern is characterised by ≥2 mm coved ST-segment elevation in right-sided precordial leads (V1–V3) followed by a negative T wave. The Brugada phenocopy represents electrocardiogram (ECG) changes that mimic Brugada syndrome but typically resolve with correction of an underlying cause, such as myocardial or pericardial disease, ion channel–modulating drugs, or metabolic abnormalities. Severe hyperkalemia is the most frequently reported underlying factor. Resolution of Brugada-like ECG changes after correction of the abnormal results would support a diagnosis of Brugada phenocopy rather than true Brugada.

Case report

A 76-year-old woman with a history of arterial hypertension and diabetes mellitus type II presented to the emergency department with profound generalised weakness in the absence of fever, two months after surgical aortic valve replacement and a recently resolved viral respiratory infection. No prior chronic kidney disease was documented. Initial ECG demonstrated sinus rhythm with QRS widening (138 ms) and Brugada type 1 pattern in the right precordial leads. Laboratory findings revealed acute renal failure presented with severe hyperkalemia (8.4 mmol/L), metabolic lactic acidosis (pH 7.0), and markedly elevated renal parameters (creatinine 637 μmol/L, eGFR 5 mL/min/1.73 m^2, blood urea nitrogen 47.1 mmol/L). Chronic metformin therapy was considered a contributing factor to the lactic acidosis. The patient was treated with intravenous fluid resuscitation, calcium gluconate, insulin, glucose, and furosemide. Following therapy, significant laboratory improvement was observed, accompanied by a regression of the ECG abnormalities.

Conclusion

In a patient presenting with a Brugada-like ECG pattern, a Brugada phenocopy should be considered in the differential diagnosis, having in mind hyperkalemia as its most common cause. Early identification of the underlying etiology is crucial to ensure appropriate management and avoid misdiagnosis.

Keywords: brugada phenocopy; brugada syndrome; hyperkalemia

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IMMUNE CHECKPOINT INHIBITOR-INDUCED MYOSITIS-MYOCARDITIS-MYASTHENIA OVERLAP AFTER PEMBROLIZUMAB THERAPY

***Josip Puhanić**[1]

Abstract

Immune checkpoint inhibitors (ICIs) are increasingly used as treatment for advanced malignancies. Although generally well tolerated, they may cause severe immune-related adverse events (irAEs). A rare but potentially life-threatening manifestation is the overlap syndrome combining myositis, myocarditis and myasthenia-like features. Early recognition is crucial due to the risk of rapid cardiopulmonary deterioration.

Case report

A 64-year-old man with metastatic gastric adenocarcinoma, previously treated with chemotherapy and two cycles of pembrolizumab, presented to the emergency room with acute binocular diplopia and bilateral ptosis. Neurological examination confirmed bilateral ptosis, horizontal gaze palsy and diplopia in all gaze directions. Laboratory findings demonstrated significantly elevated creatine-kinase (2878 U/L), myoglobin (2614 ug/L) and troponin I (2577 ng/L), suggesting concomitant myositis and myocardial involvement. Brain CT scan was unremarkable. Immune mediated overlap syndrome secondary to PD-1 inhibitor therapy was suspected. The patient was hospitalized for cardiopulmonary monitoring. Initial neostigmine test was inconclusive, but repeated testing confirmed a myasthenic component. Cardiac evaluation showed no evidence of acute coronary syndrome. The patient was treated with pulse corticosteroid therapy, intravenous immunoglobulins (0.4 g/kg for 5 days), acetylcholinesterase inhibitors and supportive therapy, while pembrolizumab was permanently discontinued. During hospitalization, creatine kinase, myoglobin and troponin I levels significantly declined. Limb strength, horizontal gaze palsy and diplopia partially improved (MG-ADL score 7).

Conclusion

Immune checkpoint inhibitor-induced overlap syndrome is a rare but serious complication requiring prompt multidisciplinary management. Ocular symptoms combined with significantly elevated creatine-kinase and troponin levels in patients recieving PD-1 inhibitors should raise suspicion for concurrent myositis and myocarditis. Early immunosupresive therapy and close cardiopulmonary monitoring are essential to prevent life-threatening complications.

Keywords: immunotherapy; myasthenia; myocarditis; myositis; pembrolizumab

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IMPLEMENTATION OF A DUAL-ENERGY CT PROTOCOL FOR POLYTRAUMA PATIENTS IN THE UNIVERSITY HOSPITAL CENTRE ZAGREB

***Lea Miklić[1], Marijana Pervan[1], Alen Udovičić[1], Vinko Michael Dodig[1]**

Abstract

Whole-body CT (WBCT) plays a central role in polytrauma management by enabling rapid, comprehensive assessment of life-threatening injuries. Yet, it delivers substantial radiation exposure. The radiation is non-trivial, but timely diagnosis tends to outweigh the associated risk in most patients. In 2020, the European Society of Emergency Radiology (ESER) issued a guideline on radiological polytrauma imaging and services . ESER advocates moving away from a one-size-fits-all approach and promoting a double-track whole-body tomography protocol concept, comprising a Dose Protocol and a Time/Precision Protocol. Selection between the two variants should be guided by the patient's clinical presentation and vital parameters. The Dose Protocol minimizes radiation exposure while still ensuring a reliable injury diagnosis. The Time/Precision Protocol prioritizes speed and high diagnostic accuracy for detecting life-threatening injuries, particularly in unstable patients. University Hospital Zagreb has implemented the protocols in the last year using Dual Energy CT (DECT). DECT allows for short examination times , improved differentiation of tissue using two different X-ray spectra, perfusion imaging, and the possibility of "virtual non-contrast images," for which no previous imaging without contrast media has to be performed. We observed a decrease in radiation exposure when using the DE polytrauma protocol in relation to standard WBCT. When comparing the medians of the total dose-length product (DLP), for standard WBCT the DLP was 5940 mGycm (number of studies 255, time period July 2, 2024 – October 13, 2025). For the DECT protocol for hemodynamically stable patients, the DLP was 2671 mGycm (number of studies 164, time period November 4, 2024 – October 16, 2025), a reduction of 55 %, and for the DECT protocol for hemodynamically unstable patients, the DLP was 3247.5 mGycm (number of studies 19, time period November 4, 2024 – October 6, 2025), a reduction of 45 %.

Conclusion

DECT polytrauma protocols are feasible and can enhance diagnostic confidence by providing multisystem information while maintaining acceptable radiation exposure.

Keywords: dual-energy CT protocol; polytrauma; radiation

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IS HEAD CT ALWAYS NECESSARY? EXPERIENCE WITH THE CANADIAN HEAD CT RULE IN EMERGENCY DEPARTMENT

***Faruk Ajdinović[1], Amel Mizić[1], Dženisa Selimović[1], Irma Arifović[1]**

Abstract

Head injuries are among the most common reasons for admission to the Emergency Medicine Center and pose a significant diagnostic challenge. Computed tomography (CT) is the gold standard in the initial assessment due to its high sensitivity for detecting intracranial injuries. However, its widespread and sometimes uncritical use may overload emergency services and prolong patient stay. Clinical decision rules aim to optimize imaging use, with the Canadian Head CT Rule (CCHR) being one of the most widely validated. Aim of this study is to evaluate the application of the CCHR in patients presenting to the Emergency Medicine Center and assess its potential to rationalize CT head indications without compromising patient safety.

Methods

This retrospective study analyzed patients admitted for head trauma over one year using medical record data and descriptive statistics.

Results

The initial sample included 272 patients who underwent head CT; 54 were excluded due to age under 16 years, anticoagulant use, or immediate post-injury seizures. The final cohort consisted of 218 patients, 65 % male and 35 % female. The most frequent positive CCHR criterion was amnesia longer than 30 minutes (present in 81 patients), while skull/base fracture signs were rare (5 patients). According to CCHR, CT was indicated in 70 % of cases and not indicated in 30 %. CT findings were normal in 82% and abnormal in 18% of patients. Among patients with normal CT findings, 89 % had indications according to CCHR, whereas among patients with abnormal CT findings, 23 % were not indicated for CT by CCHR.

Conclusion

The high proportion of normal CT scans despite fulfilled criteria suggests possible overuse of imaging. Conversely, abnormal findings not indicated by CCHR emphasize that the rule should not be applied in isolation. CCHR is a valuable tool that should be combined with clinical judgment to ensure safe and rational CT utilization in emergency medicine.

Keywords: CCHR; CT; head

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IS ISCHEMIC STROKE ONLY AN ADULT DISEASE? : A CASE OF ISCHEMIC STROKE IN A PEDIATRIC PATIENT

***Ahmet Celal Özsoy**

Abstract

Ischemic stroke is a rare and difficult-to-diagnose disease in the pediatric patient group. However, early diagnosis and treatment reduce mortality and morbidity . Therefore, the diagnosis of ischemic stroke should be considered in pediatric patients presenting to the emergency department with altered consciousness. We will present a pediatric case that presented to our emergency department with altered consciousness and was subsequently diagnosed with ischemic stroke.

Case report

A 6-year-old female patient was brought to our emergency department by her family approximately 30-45 minutes ago with complaints of altered consciousness. No history of chronic illness or trauma. The patient's vital signs were stable, but she was sleepy, and her glasgow coma score (GCS) was 14. A cranial CT scan was planned for the patient. The cranial CT scan result was normal. During the patient's follow-up examination, left-sided facial paralysis was present. The patient was urgently consulted to the pediatric neurology clinic, and a cranial MRI was planned. The cranial MRI showed diffusion restriction consistent with acute ischemia in the right middle cerebral artery territory. Angiography CT scan was scheduled to evaluate the thromboectomy treatment, and occlusion was detected in the right internal carotid artery. However, thromboectomy treatment wasn't considered by interventional radiology. Anticoagulation and anti-edema treatment were planned for the patient with a preliminary diagnosis of ischemic stroke, and the patient was transferred to the intensive care unit.

Conclusion

Reperfusion therapies are supported by randomized studies in adult patients, but there is still no clear consensus in the pediatric patient group. There are studies in the literature showing positive functional outcomes in pediatric patients treated with endovascular thrombectomy and intravenous thrombolysis for ischemic stroke. Therefore, we would like to emphasize the need for more research on reperfusion therapies, which we believe will yield more positive results in pediatric patients, and the importance of early diagnosis.

Keywords: emergency medicine; endovascular thrombectomy; ischemic

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LIPOSARCOMA AS A CAUSE OF NONSPECIFIC ABDOMINAL PAIN: A CASE REPORT

***Luka Ćurić[1], Marinka Otočan[2], Dinko Fabrio[1]**

Abstract

Liposarcoma is a malignant mesenchymal tumor originating from adipose tissue. It most commonly occurs in the retroperitoneum and deep soft tissues of the extremities. It predominantly affects middle-aged and older adults, more often males. Frequently presenting with nonspecific clinical symptoms.

Case report

The 83-year-old female patient presented to the emergency department with nonspecific abdominal pain. On admission, the patient was hypertensive, tachypneic, hemodynamically stable, and clinically cardiologically compensated. Pain began one month prior, initially localized to the epigastric and paraumbilical regions, with gradual intensification over the last few days. One month earlier, an abdominal ultrasound confirmed cholelithiasis. The patient had not had bowel movements for five days. Ultrasound revealed distended small bowel loops with air-fluid levels, raising suspicion for ileus. On examination, a mass was palpated in the left lower abdomen, without detectable Doppler flow or clear communication with intra-abdominal organs. Emergency CT of the abdomen and pelvis confirmed dilated small bowel loops caused by compression from a large retroperitoneal well-differentiated liposarcoma originating at the level of the psoas muscle. The patient was referred to the Department of Digestive Surgery, where conservative therapy was initiated upon admission. Due to elevated troponin T (TnT) and N-terminal pro–B-type natriuretic peptide (NT-proBNP) levels and the tumor's proximity to major venous structures, a CT pulmonary angiography was performed to rule out thromboembolism. The case was presented to a multidisciplinary team to discuss potential treatment modalities. Given the patient's deteriorating general condition and active comorbidities, surgical treatment was not indicated. The patient's further clinical course was complicated by the development of pulmonary embolism.

Conclusion

Nonspecific abdominal symptoms, such as mild or paraumbilical pain, may conceal serious pathological conditions. In this case, a retroperitoneal liposarcoma caused ileus, highlighting the importance of early diagnosis, careful clinical evaluation, and a multidisciplinary approach for timely recognition and optimal management of complex patients.

Keywords: abdominal symptoms; ileus; liposarcoma

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GASTRIC RUPTURE AFTER CPR

***Mihaela Leš Golub**[1]

Abstract

Gastric rupture represents a rare yet life-threatening complication of cardiopulmonary resuscitation (CPR). Rapid increases in intragastric pressure during mask ventilation, air insufflation, or impaired gastric wall perfusion following cardiac arrest may precipitate gastric perforation. Prompt diagnosis of pneumoperitoneum in post-resuscitation patients is critical to enable timely surgical intervention.

Case report

We present the case of an 87-year-old woman with multiple comorbidities, including permanent atrial fibrillation, hypertension, type 2 diabetes, chronic kidney disease, hypothyroidism, and a history of bilateral mastectomy and ongoing chemotherapy. She experienced out-of-hospital cardiopulmonary arrest. Upon arrival at the outpatient emergency department, the initial rhythm was ventricular fibrillation. She received six defibrillations, adrenaline, and amiodarone. Upon arrival at our facility, she was unconscious, with a palpable pulse, an I-gel in place, and spontaneous respirations of 5-6 per minute with significant abdominal distension. The patient was endotracheally intubated and placed on mechanical ventilation. Laboratory findings indicated leukocytosis, elevated CRP, acute kidney injury, and metabolic acidosis. Native abdomen and later CT scans showed massive pneumoperitoneum, and was disproportionate to the clinical context and suggested perforation of the stomach or ascending colon. The patient was admitted to the surgical intensive care unit, after which she was referred for emergency laparotomy. A 20 cm rupture along the greater curvature of the stomach was found, and gastric contents and air were found in the abdominal cavity. Postoperatively, the patient was intubated, mechanically ventilated on dual vasopressor therapy, oliguric with the development of progressive multiorgan dysfunction. The patient died that same day in the afternoon despite all measures taken.

Conclusion

Gastric rupture following CPR is rare but recognized complication, particularly in elderly patients with ischemic gastric wall injury after cardiac arrest. Even with prompt surgical repair, prognosis is poor due to the initial hypoxic insult, septic progression, and multiorgan failure.

Keywords: CPR; gastric rupture; ventilation

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HELICOPTER EMERGENCY MEDICAL SERVICE IN CROATIA: SYSTEM DEVELOPMENT, ORGANIZATIONAL STRUCTURE AND EARLY OPERATIONAL OUTCOMES

***Saša Balija[1], Maja Grba-Bujević[1]**

Abstract

Helicopter Emergency Medical Service (HEMS) in the Republic of Croatia officially started operations on 30th March 2024 as a strategic government initiative aimed at improving accessibility and quality of emergency medical care. The service was established to ensure equal access to life-saving interventions, particularly for critically ill and injured patients in geographically remote, rural areas and islands. HEMS operates through four strategically positioned bases in Zagreb, Osijek, Rijeka, and Split, providing nationwide coverage. Zagreb and Osijek base operate 24/7, while the remaining bases provide daytime service. The system was developed following a comprehensive feasibility study, market analysis, and review of best practices across European Union member states. It functions as a public–private partnership, integrating domestic EMS teams with aviation services provided by an international consortium. During the first two years, more than 3000 HEMS missions were conducted. The majority involved primary and secondary interventions of critically ill patients, including those with severe trauma, acute myocardial infarction and stroke. A substantial proportion of missions served island and tourist regions, reinforcing HEMS as a key component of emergency healthcare in these areas. The service enables rapid access to hard-to-reach locations, reduces transport times to specialized hospitals, and facilitates direct transfer to tertiary care centers. Activation of HEMS is based on standardized national guidelines issued by Croatian Institute of Emergency Medicine and coordinated through medical dispatch centers. Dispatchers play a central role in triage and decision-making ensuring appropriate use of all resources through close collaboration with ground EMS teams.

Conclusion

The Croatian HEMS system has demonstrated significant value in improving access to timely and specialized emergency care. Its structured organization, standardized activation protocols, and integration with ground EMS teams support efficient resource utilization and positive patient outcomes. Continued system optimization, intersectoral cooperation and quality monitoring are essential for sustaining and further enhancing its performance.

Keywords: air medical transport; HEMS

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HIDDEN CRISIS

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Abstract

Myxedema coma represents severe form of hypothyroidism that often leads to coma and cardiovascular collapse. Although the hypothyroidism is successfully treated, nonadherence to therapy can trigger life-threating state of myxedema coma. Because neurological deterioration is nonspecific and often multifactorial, timely recognition of myxedema coma can be challenging.

Case report

A 52-year old male was brought to the emergency department after he was found lying on the floor at home. He had experienced progressive fatigue and altered mental status lasting 2 weeks. His medical history included chronic alcohol abuse, hypothyroidism treated with levothyroxine, and arterial hypertension. On admission he was hypotensive, bradycardic and hypoglycemic. On clinical examination patient was confused and lethargic, without focal neurological deficits. Initial laboratory tests revealed pancytopenia, macrocytic anaemia, disturbances in coagulation tests, hypokalemia and hypoglycemic metabolic ketoacidosis. Serum ethanol levels were negative. Inflammation marker was low enough to rule out acute infection and imaging studies done were unremarkable. During observation in ER, he developed cardiorespiratory arrest. Return of spontaneous circulation (ROSC) was achieved after 25 minutes of cardiopulmonary resuscitation, transferred to the intensive care unit (ICU) and placed on mechanical ventilation. During his stay in ICU, upcoming laboratory tests showed significant increase in TSH levels confirming severe hypothyroidism as the underlying cause of cardiovascular collapse. The patient recieved vasoactive support, broad-spectrum antibiotic therapy, continuous glucose and insulin infusion and high-dose levothyroxine substitution. Following symptoms resolution, he was discharged into psychiatric hospital with recommendation for strict adherence levothyroxine therapy and endocrinology follow-up.

Conclusion

When managing patient with hypothyroidism and altered mental status, myxedema coma must always be considered as a potential cause of clinical deterioration. The key clinical features - bradycardia, hypotension, hypothermia and metabolic disturbances must raise clinical suspicion, especially with provoking event like acute infection, surgery or less common one - poor adherence to therapy.

Keywords: alcoholism; fatigue; hypotension; levothyroxine; myxedema

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IMPLEMENTATION OF ERC 2025 NEUROPROGNOSTICATION AFTER OUT-OF-HOSPITAL CARDIAC ARREST: EARLY RESULTS FROM A HIGH-VOLUME EMERGENCY CENTER IN ROMANIA

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Abstract

Neurological outcome prediction in comatose survivors after out-of-hospital cardiac arrest (OHCA) remains a critical challenge and requires a structured multimodal strategy, as emphasized by the 2025 European Resuscitation Council (ERC) guidelines. Real-world data regarding early implementation of these recommendations in resource-variable emergency settings are limited. This study aimed to evaluate the feasibility, adherence, and early clinical implications of ERC-recommended neuroprognostication in a tertiary emergency department.

Methods

We conducted a prospective observational study over a 12-month period beginning November 1, 2025; this interim analysis includes patients enrolled until February 15, 2026. Adult patients (>18 years) admitted after non-traumatic OHCA were screened among approximately 21,000 emergency department presentations at the emergency department of the "Sf. Spiridon" County Emergency Hospital, Iași, Romania. Exclusion criteria included stroke within the previous 3 months, traumatic cardiac arrest, known terminal illness, or pre-arrest Cerebral Performance Category (CPC) >3.

Results

Twenty-two patients (out of 32 CA) met inclusion criteria and underwent multimodal assessment. Implementation of the ERC protocol was feasible but incomplete, with variable adherence to recommended timing and full modality integration. Following family consent, patients underwent ERC-based multimodal neuroprognostication, including serum biomarkers (neurofilaments, NES- enolase, S100B, Tau protein, UCHL-1, NGF), native brain CT at 12–24 and 48–72 hours, and electroencephalography. Barriers included limited technical availability, workflow constraints, and financial restrictions. Early observations suggest substantial heterogeneity in the application of prognostic tools within routine emergency practice.

Conclusion

Early implementation of ERC 2025 neuroprognostication in a high-volume emergency department is achievable but challenged by organizational and resource limitations. Ongoing enrollment will enable correlation between multimodal prognostic findings and neurological survival, providing essential real-world data to guide optimization of post–cardiac arrest care in middle-resource healthcare systems.

Keywords: EEG; emergency; ERC; neuroprognostication; OHCA

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INSIDIOUS HSV-1 ENCEPHALITIS

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Abstract

Term encephalitis represents inflammation of the brain parenchyma. Causes can be divided into three groups: infectious, post-infectious, and non-infectious. Infections account for approximately 50 % of all causes. Clinical signs indicating encephalitis include fever, epileptic seizures, and focal neurological deficits. Prompt recognition and treatment are life-saving.

Case report

A 27-year-old patient initially presents to the emergency departmet (ED) due to a two-day headache and a tingling sensation on the right side of the body that began on the day of arrival at the ED. Initially performed neurological examination is completely normal. During the observation, he develops right-sided hemiparesis and becomes dysphasic. Intravenous systemic thrombolysis is performed, leading to a regression of symptoms, and the patient is hospitalized. The conducted examination, which included EEG, MRI, and lumbar puncture, revealed lymphocytic pleocytosis and proteins, led to the diagnosis of serous encephalitis. Four days after being discharged from the hospital, he returns to the ED due to the same symptoms. Upon the prescribed treatment there is a regression of symptoms, and the patient is discharged home the same day. Two days after the previous examination, he was brought in by ambulance due to worsening headaches, right-sided paresthesia, dysphasia, and newly developed photophobia, confusion, and agitation. The initial neurological status is normal. A repeat MRI of the brain is performed, and a PCR test for neurotropic pathogens in the cerebrospinal fluid is conducted again, which is positive for the Herpes Simplex Virus (HSV) virus. Parenteral therapy with acyclovir has been initiated, and the patient has been transferred to an infectious disease clinic.

Conclusion

This case highlights the variable and recurrent clinical presentation of HSV encephalitis that can mimic a cerebrovascular accident. Despite the initially negative findings, repeated diagnostic testing allowed for etiological confirmation. Timely recognition and initiation of acyclovir is crucial for a favorable outcome and the prevention of permanent neurological consequences.

Keywords: acyclovir; encephalitis; HSV; lumbar puncture

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INTEGRATION OF ARTIFICIAL INTELLIGENCE INTO POINT-OF-CARE ULTRASOUND IN EMERGENCY MEDICINE

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Abstract

Point-of-care ultrasound (POCUS) is widely used in emergency medicine for rapid bedside diagnosis and management. However, its effectiveness is limited by operator dependence, variable image quality, and the need for rapid interpretation. Artificial intelligence (AI) has emerged as a solution to support image acquisition, quality control, automated measurements, and diagnostic interpretation while preserving clinician oversight.

Methods

A structured narrative review of studies published between 2020 and 2025 identified 93 articles evaluating AI applications in emergency or acute-care POCUS. Most studies used convolutional neural networks and were conducted in North America and Europe. Reported diagnostic performance was high, with area under the curve (AUC) values typically above 0.85 and sensitivities and specificities between 80% and 95%.

Results

In trauma, AI-assisted POCUS improved detection of pneumothorax, hemothorax, and intra-abdominal free fluid, supporting standardized eFAST and rapid triage. Cardiovascular applications enabled automated estimation of left ventricular ejection fraction, velocity–time integral, and inferior vena cava measurements with good agreement compared to experts. Pulmonary uses included automated B-line quantification, pneumothorax detection, and pleural pathology classification. Abdominal applications supported free fluid detection and early obstetric and gynecologic assessment. AI also improved workflow, assisted non-expert users, and showed potential for portable, low-resource settings.

Conclusion

AI-enhanced POCUS is transitioning from proof-of-concept to early clinical integration and demonstrates strong potential to improve diagnostic consistency and efficiency in emergency care. However, many studies rely on retrospective, single-center datasets with limited external validation, raising concerns regarding generalizability, device heterogeneity, and dataset bias. Evidence of improved patient outcomes remains limited. Future implementation will require prospective multicenter studies, development of diverse and representative datasets, vendor-agnostic solutions, and alignment with clinical, ethical, and regulatory frameworks.

Keywords: AI-POCUS; emergency; POCUS

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INTRACEREBRAL HEMORRHAGE TRIGGERED BY SEXUAL ACTIVITY WITH PREDOMINANT VISUAL FIELD DEFICIT

***Zdeslav Strika[1], Ana Katić[1], Bruno Sen[1], Ervin Jančić[2]**

Abstract

Intracerebral hemorrhage (ICH) represents a life-threatening cerebrovascular emergency characterized by spontaneous intraparenchymal bleeding with high risk of early neurological deterioration. Chronic arterial hypertension and cerebral small vessel disease represent the leading underlying conditions. Clinical presentation depends on hemorrhage location and may include focal neurological deficits, seizures, headache, and altered consciousness.

Case report

A 55-year-old male presented with acute right-sided visual field loss characterized as right homonymous hemianopsia, accompanied by bifrontal headache and transient dysarthria. Symptoms developed abruptly during physical exertion. He had a history of left hemispheric intracerebral hemorrhage one year prior, with residual mild right-sided hemiparesis and subsequent structural epilepsy. Additional comorbidities included arterial hypertension and chronic nicotine use. On admission, he was alert, oriented, afebrile, with blood pressure 165/90 mmHg and sinus tachycardia (110/min). Neurological examination confirmed right homonymous hemianopsia without new significant motor deficit. Laboratory findings were unremarkable, including normal coagulation parameters. Emergency computed tomography (CT) of the brain demonstrated a left hemispheric intracerebral hemorrhage with surrounding edema. CT angiography of the head and neck revealed no vascular pathology. The patient was admitted to the intensive care unit (ICU), and treatment included blood pressure control (urapidil, amlodipine), antifibrinolytic therapy (tranexamic acid), electrolyte correction, and continuation of antiepileptic therapy.

Conclusion

Sexual activity may act as a precipitating factor for intracerebral hemorrhage due to acute sympathetic activation and transient surges in systemic blood pressure that exceed cerebrovascular autoregulatory capacity in patients with hypertensive vasculopathy. Abrupt hemodynamic stress can lead to rupture of structurally weakened small penetrating arteries. Although cerebrovascular events during sexual activity are uncommon, they are well-documented in association with aneurysmal subarachnoid hemorrhage and, less frequently, intracerebral hemorrhage. Strict long-term blood pressure control, smoking cessation, optimization of antihypertensive therapy, and individualized counseling regarding graded physical exertion during intimacy are essential to reduce recurrence risk.

Keywords: cerebrovascular emergency; hemianopsia; hypertension; ICH

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ISCHEMIC STROKE IN A PATIENT RECEIVING ANTICOAGULANT THERAPY: A CASE REPORT

***Nikolina Požega[1], Tomislava Mrgan[1], Lovro Jančić[1]**

Abstract

Acute ischemic stroke presents with sudden focal neurological deficit, requiring prompt restoration of cerebral perfusion with intravenous thrombolysis, endovascular thrombectomy, or both. This case report emphasises the timely recognition and transport by emergency services, alongside the individualised management of ischemic stroke in a patient on low-molecular-weight heparin.

Case report

A 64-year-old oncology patient presented with transient loss of consciousness, prompting activation of emergency medical services. On arrival, the patient was conscious, hypotensive with a blood pressure of 80/50 mmHg, and bedridden, with central-type left facial paresis and left-sided hemiparesis; he had previously been fully mobile. He is undergoing active chemobiotherapy for colorectal cancer with lung metastases, with radiologically confirmed lesion regression. The lesion abutted the superior vena cava, with suspected pulmonary artery involvement, and the patient was on daily low-molecular-weight heparin. Following pre-notification, emergency medical services transported the patient to a general hospital, where a saline bolus and antiemetic were administered. Upon admission, the patient underwent a comprehensive diagnostic evaluation. Laboratory tests, chest radiography, carotid and vertebral doppler, transcranial doppler, 24-hour holter ECG, brain MSCT, and brain MRI revealed no acute pathology. MSCT angiography, however, demonstrated focal contrast interruption in a distal branch of the inferior M2 segment of the right middle cerebral artery (MCA), consistent with branch occlusion. The patient was hospitalised in the neurology department and treated with low-molecular-weight heparin, antiplatelet agents, gastroprotective therapy, antibiotics, inhalations, infusions, and other symptomatic therapies. In consultation with the clinical hospital centre, given the use of low-molecular-weight heparin therapy, the patient was not a candidate for mechanical thrombectomy. The patient is discharged in a stable general condition.

Conclusion

Prehospital prenotification and coordination are essential for timely acute stroke management. In this patient with significant comorbidities, early prenotification and consultation with a tertiary centre facilitated an individualised, coordinated treatment approach at the initial receiving hospital.

Keywords: heparin; oncology; occlusion; stroke; treatment

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IT'S A KIND OF MAGIC: HOW "VIBE CODING" WITH AI EMPOWERS CLINICIANS TO BUILD THEIR OWN TOOLS

***Alan Kvarantan**[1]

Abstract

What is "vibe coding," and how can it revolutionize the workflow of medical professionals? At its core, vibe coding is the use of Large Language Models (LLMs) to bridge the gap between a clinical idea and a functioning digital reality, requiring zero formal software engineering education.

Case report

I will present two functional tools created entirely through natural language interaction with Google Gemini: 1. Administrative Automation: Using Gemini to write Google Apps Script, I developed a tool that automatically "translates" schedules from Google Sheets into Google Calendar events. This automation eliminates manual entry errors and saves time. 2. Operational Support for HEMS: To support foreign pilots operating in Croatian Helicopter Emergency Medical Services (HEMS), I built and deployed a web application using Google Firebase Studio. This tool instantly calculates and displays the distance and compass heading from the HEMS base to the mission location, enhancing situational awareness and response speed.

Conclusion

This presentation demonstrates that the only barrier to innovation is now imagination, not technical skill. AI is shifting the paradigm from "learning to code" to "coding to solve," placing the power of digital innovation directly into the hands of the medical providers who understand the problems best.

Keywords: generative AI; HEMS; LLM

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IT'S NOT MAGIC, IT'S (HOCUS) POCUS – REAL-LIFE EXAMPLES OF EXPEDITING DIAGNOSIS AND TREATMENT IN THE EMERGENCY DEPARTMENT USING POINT OF CARE ULTRASOUND (POCUS)

***Điđi Delalić[1], Višnja Nesek Adam[1]**

Abstract

Point of Care Ultrasound (POCUS) has evolved into a core competency and a quintessential tool of emergency physicians worldwide, transfoming ultrasound examinations from an auxillary test performed away from the point of care to the into an integrated modality used in tandem with the physical examination during the initial patient contact. This transformation has enabled significant expedition of the diagnostic process, allowing emergency physicians to establish either a working or definitive diagnosis in a matter of minutes, while also allowing for a range of therapeutic interventions to be performed in a more efficient and safe manner under direct ultrasound guidance. The goal of this presentation is to demonstrate the effectiveness of POCUS in facilitating diagnostic workups and therapeutic interventions, using real-life cases and images recorded during everyday routine on-shift POCUS use in a tertiary academic center's emergency department. The cases and images are accompanied by brief insights into the latest literature providing information on the diagnostic features (including sensitivity, specificity, overall diagnostic accuracy etc) of individual POCUS modalities and examination protocols.

Conclusion

Finally, this presentation also aims to demonstrate and analyse the learning curves and real-life logistical challenges of individual POCUS modalities from the perspective of an emergency medicine resident still undergoing ultrasound training and extensively using POCUS during their everyday work as a junior clinician in the emergency internal medicine clinic.

Keywords: diagnostic features; education; POCUS

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JOB SATISFACTION AND PERCEIVED SCOPE OF PRACTICE AMONG NURSES AND MEDICAL TECHNICIANS SPECIALIZED IN EMERGENCY MEDICINE

***Darko Stošić[1], Ana Tancabel Mačinković[1]**

Abstract

Nurses and medical technicians specializing in emergency medicine play a crucial role in prehospital and emergency healthcare, with their professional scope of practice in the Republic of Croatia defined by the current regulatory framework. However, in everyday clinical practice, questions increasingly arise regarding the alignment of these prescribed competencies with the real demands of emergency medical care, particularly when compared with more advanced European systems where nursing professional autonomy is more pronounced. The aim of this study is to assess job satisfaction and the perception of professional authority and clinical competencies among nurses and medical technicians specializing in emergency medicine in relation to the current regulations.

Methods

A descriptive cross-sectional study is planned, using an anonymous questionnaire administered to specialists employed at the Institute of Emergency Medicine of the Primorje-Gorski Kotar County. The questionnaire will include socio-professional characteristics, assessment of job satisfaction, professional autonomy and safety, as well as attitudes toward the expansion of key clinical competencies, including independent administration of basic medications, pain assessment and titration of analgesia, clinical patient assessment, use of point-of-care ultrasound (POCUS) in emergency medicine, application of non-invasive mechanical ventilation, and performance of rapid sequence intubation. Data will be analyzed using descriptive statistical methods.

Results

The expected findings are anticipated to indicate a discrepancy between the level of professional responsibility and the existing scope of practice.

Conclusion

With this study we highlightit the need for further alignment of regulations with contemporary emergency medicine practice in order to improve quality of care and professional satisfaction.

Keywords: emergency medicine; nursing; professional scope

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KNOWLEDGE AND ATTITUDES OF HEALTH CARE PROFESSIONALS AND PATIENTS ON LIVING WILL

***Tamara Petrić[1], Martina Pavletić[1], Iva Sorta Bilajac Turina[2]**

Abstract

A living will is a form of advance directive that enables patients to state their wishes about medical treatment should they become unable to make decisions. Despite its ethical significance, the concept is poorly regulated and rarely applied in Croatian clinical practice. This review aims to summarize current knowledge and attitudes of healthcare professionals and patients regarding living wills, with special attention to international experiences and their potential relevance for Croatia.

A literature review was conducted using scientific and legislative sources addressing the use, awareness, and ethical aspects of living wills and advance directives in Europe and other developed health systems.

In countries that have a long-standing practice of applying living wills, there are still certain problems regarding the interpretation of individual documents and inconsistencies with existing legislation, and limited professionals and public understanding. Multiple sources confirm the thesis that making decisions related to the suspension of active treatment is the most difficult and complex clinical judgement. Currently, in Croatia, there is no substantial regulation of biological wills, only a formal one, which refers to the general concept of advance directives. In the existing laws concerning the doctor-patient relationship, there are no clear guidelines regarding living wills, and the medical profession has not yet been involved in their drafting. Additionally, the percentage of citizens who actually use advance directives is very small, indicating weak social recognition of them.

Conclusion

In countries that have attempted to implement living wills, the main challenges identified include limited awareness among patients and healthcare professionals and the ambguity of the existing legal framework. Strengthening legal clarity and promoting ethical discussion within the medical community are essential initial steps toward integrating living wills into Croatian healthcare practice.

Keywords: end-of-life care; ethics; living will

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LESSONS FROM THE DARK SIDE OF THE MOON: A RADIOLOGIST'S INSIGHTS INTO RENAL POINT-OF-CARE ULTRASOUND

***Vinko Bubić[1], Tomislav Crnčević[2], Maja Grubelić Crnčević[1], Mia Grgić[1], Vittorio Perić[1], Matija Bočkor[1], Velimir Karadža[3], Krunoslav Marinčević[1], Ingrid Prkačin[4], Helga Sertić Milić[1], Vinko Vidjak[1]**

Abstract

Point-of-care ultrasound (POCUS) of the kidneys has become an essential diagnostic tool in emergency and acute care settings. Rapid bedside evaluation of renal morphology, obstruction, perfusion, and parenchymal changes can significantly influence early clinical decision-making, particularly in patients with acute kidney injury (AKI) and undifferentiated abdominal symptoms. However, interpretation pitfalls remain frequent when renal POCUS is performed outside radiology departments. The aim of this study was to present key diagnostic principles, common pitfalls, and clinically relevant applications of renal POCUS from a radiologist's perspective.

Methods

This work is based on structured educational analysis of clinical cases, teaching materials, and interdisciplinary clinical experience in emergency and hospital practice. Emphasis was placed on practical interpretation of B-mode and Doppler findings in AKI, obstructive uropathy, renal infections, vascular abnormalities, cystic lesions, renal masses, and transplant kidney assessment, including integration of the VExUS protocol.

Results

Renal POCUS enabled rapid detection of hydronephrosis, urolithiasis, perirenal collections, and major structural abnormalities. Differentiation between hydronephrosis and parapelvic or peripelvic cysts was identified as a frequent diagnostic pitfall. Doppler ultrasound proved crucial for assessing renal perfusion, renovascular disease, and transplant complications. Evaluation of kidney size, cortical thickness, and echogenicity supported differentiation between acute and chronic renal pathology, while VExUS assessment provided additional insight into venous congestion in cardiorenal patients.

Conclusion

Renal POCUS represents a powerful extension of clinical examination in acute care. When combined with radiological expertise in anatomy, pathology, and ultrasound artifacts, it improves diagnostic accuracy, triage, and early management. Nevertheless, suspicious masses, complex cystic lesions, and inconclusive findings should always prompt further radiological imaging and specialist consultation.

Keywords: doppler ultrasound; POCUS; VExUS; hydronephrosis

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LOW-ENERGY TRAUMATIC SUBDURAL AND SUBARACHNOID HEMORRHAGE FOLLOWING LOW-ENERGY HEAD INJURY IN AN ELDERLY PATIENT – CLINICAL DECISION-MAKING BETWEEN CONSERVATIVE AND SURGICAL MANAGEMENT

***Magdalena Šiljković[1], Nina Lovrić[2], Martina Pavletić[1-2]**

Abstract

Traumatic subdural hemorrhage (SDH) in elderly patients represents a diagnostic and therapeutic challenge, as even low-energy trauma may lead to significant intracranial bleeding, particularly in the presence of cognitive impairment and coagulopathy. Management decisions should integrate clinical presentation with radiological findings, especially when assessment is limited by pre-existing cognitive decline.

Case report

A 78-year-old woman with a history of dementia, affective disorder, hypertension and qualitative platelet dysfunction presented to the emergency department (ED) after a fall from standing height in a nursing home, sustaining an occipital head injury without loss of consciousness or vomiting. On admission, she was hemodynamically stable, conscious but non-verbal, visually tracking, with normal pupillary reflexes and symmetrical spontaneous movements of all extremities without lateralizing signs. A 3-cm occipital laceration without active bleeding was present. Laboratory results showed mild anemia and thrombocytopenia with normal coagulation parameters. Computed tomography (CT) of the head revealed a right supratentorial subdural hematoma measuring up to 8 mm with mild compression of the temporal horn and a small right parietal subarachnoid hemorrhage. No midline shift, herniation, or skull fracture was present. Given the hematoma size below standard surgical thresholds and the absence of neurological deterioration, conservative management with close clinical and radiological observation was initiated. Serial examinations and repeat CT imaging showed partial hematoma resorption without progression. The patient remained stable and was discharged after five days with recommendations for outpatient neurosurgical follow-up and repeat neuroimaging.

Conclusion

This case highlights that even low-energy head trauma in elderly patients may result in clinically significant intracranial bleeding. However, radiological hematoma thickness alone should not dictate surgical intervention. In carefully selected, hemodynamically stable patients without neurological decline, structured conservative management can be safe and effective. Individually tailored decisions remain essential in geriatric neurotrauma, where surgical risks may exceed potential benefits.

Keywords: clinical; elderly; geriatric; head trauma

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MANAGEMENT OF ACUTE HEART FAILURE COMPLICATED BY ACUTE CORONARY SYNDROME: A PRE-POST EDUCATIONAL STUDY. AN IMPACT OF HIGH-FIDELITY CLINICAL SIMULATION ON EMERGENCY MEDICINE TRAINEES

***Albana Kociaj[1], Rudina Preci[1], Elien Gjata[1], Edmond Zaimi[1]**

Abstract

Acute Heart Failure (AHF) often appears as the first sign of Acute Coronary Syndrome (ACS), especially in patients with acute myocardial ischemia. Managing this complex emergency requires rapid hemodynamic stabilization, simultaneous Acute Heart Failure (AHF) and ACS treatment, and strong interdisciplinary coordination under intense time pressure. First-year emergency medicine trainees frequently lack the experience to handle such high-risk cases effectively. Clinical simulation offers a safe, realistic training environment where these scenarios can be practiced without endangering patients. This pre-post educational study aims to evaluate how high-fidelity simulation impacts trainees' performance in managing AHF complicated by ACS. It focuses on assessing improvements in clinical knowledge, practical skills (e.g., ECG interpretation, therapy selection, ventilation use), professional confidence, teamwork, and decision-making. Secondary goals include evaluating error recognition and preparedness for real-life emergencies. The study ultimately supports integrating simulation-based training into emergency medicine curricula for better management of critical cardiac events.

Methods

A prospective pre–post educational study was conducted among first-year emergency medicine trainees. Participants completed baseline knowledge tests, confidence questionnaires, and performance assessments during a standardized scenario of Acute Heart Failure complicating Acute Coronary Syndrome. They then underwent high-fidelity simulation using a mannequin-based cardiac emergency scenario with integrated ECG interpretation, non-invasive ventilation initiation, pharmacologic management, and team-based decision-making. Structured debriefing followed each session. Post-intervention assessments measured changes in knowledge, technical skills, communication, and clinical confidence.

Results

Simulation-based training significantly improved integrated clinical knowledge, rapid ECG interpretation, appropriate early therapy selection, and correct application of non-invasive ventilation. Team communication and leadership behaviors demonstrated measurable enhancement. Trainees reported increased confidence and perceived preparedness for real-world management of complex AHF–ACS presentations.

Conclusion

High-fidelity simulation significantly enhances knowledge, technical performance, decision-making, and professional confidence in managing AHF complicated by ACS, supporting its structured integration into emergency medicine curricula.

Keywords: acute coronary syndrome; heart failure; simulation

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MASSIVE GASTROINTESTINAL BLEEDING AS A FATAL COMPLICATION OF AN AORTIC GRAFT: AORTOENTERIC FISTULA

***Karla Kleščić[1], Martina Pavletić[1-2], Klara Poldan Skorup[2]**

Abstract

Aortoenteric fistula is a rare but life-threatening complication following surgical reconstruction of the abdominal aorta. It most commonly presents with gastrointestinal bleeding and hemodynamic instability, requiring rapid diagnosis and urgent surgical management. Early recognition of clinical and radiological signs is crucial for survival.

Case report

We present a case of a 63-year-old man one month after resection of an infrarenal abdominal aortic aneurysm (AAA) with vascular graft implantation, with a complex vascular history (thoracic aortic dissection, TEVAR, ischemic cardiomyopathy). The patient was admitted with hematemesis and massive melena, accompanied by hypotension and tachycardia. On admission, he was in hemorrhagic shock - pale, and hemodynamically unstable. Aggressive resuscitation was initiated, including transfusion therapy, vasopressor support, central venous catheter placement, and mechanical ventilation. Ultrasound revealed free intraperitoneal fluid, while computed tomography (CT) aortography demonstrated gas collections adjacent to the graft, communication with small bowel loops, and signs of graft infection, raising suspicion of a secondary aortoenteric fistula. During emergency exploratory laparotomy, an appendectomy was performed, and histopathology confirmed subacute appendicitis. Clinical and radiological findings suggested the spread of intra-abdominal infection from the appendix to the aortic graft, leading to graft infection and subsequent formation of an aortoenteric fistula as the cause of massive gastrointestinal bleeding. Despite maximal intensive care management and surgical intervention, the patient died due to refractory hemorrhagic shock and multiorgan failure.

Conclusion

Intra-abdominal infections, including appendicitis, may represent as a source of secondary aortic graft infection and subsequent development of an aortoenteric fistula. In patients with recent abdominal aortic reconstruction, the occurrence of gastrointestinal bleeding requires immediate resuscitation, prompt radiological evaluation and urgent surgical management, as mortality remains extremely high.

Keywords: aorto-enteric fistula; aortic graft; gastrointestinal bleeding; intra-abdominal infection

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METABOLIC DISTURBANCE AFTER PROLONGED TRANSIT: RHABDOMYOLYSIS, ACUTE KIDNEY INJURY, AND EUGLYCEMIC KETOACIDOSIS IN AN ASYLUM SEEKER

***Lada Marijan[1], Višnja Nesek Adam[1]**

Abstract

Increasing global migration has led to a growing number of asylum seekers and immigrants presenting to emergency departments across Europe. Language barriers, limited access to prior medical documentation and delayed healthcare access pose significant diagnostic challenges.

Case report

Patient in this case is a 36-year-old male asylum seeker from Bangladesh who was brought to our emergency department by police officers because of general malaise and diffuse abdominal pain. Due to the language barrier, no medical history could initially be obtained. On admission, he was agitated, uncooperative, tachycardic (110 beats/min), and subfebrile (37.4 °C), with shivering and chills. Physical examination was unremarkable except for livid discoloration of the toes. Laboratory findings revealed acute renal insufficiency (creatinine 397 μmol/L), severe rhabdomyolysis (creatine kinase 10,325 IU/L), electrolyte imbalance (sodium 132 mmol/L, potassium 3.5 mmol/L), and euglycemic ketoacidosis (pH 7.235, ketones 7 mmol/L, glucose 5.5 mmol/L). Elevated pancreatic enzymes (alpha-amylase 1,038 IU/L, lipase 785 IU/L) were detected; however, clinical and ultrasound findings did not support acute pancreatitis. Chest X-ray demonstrated bilateral pneumonia. The patient was admitted to the intensive care unit and treated with intravenous rehydration, insulin therapy, electrolyte correction, antibiotics, and supportive care. Subsequent communication via a translation application revealed that he had crossed the Croatian border on foot and had been walking for several days in snowy winter conditions without adequate food, water, or footwear. The clinical and laboratory abnormalities were attributed to prolonged dehydration and starvation, while the livid toes were consistent with early-stage frostbite. After stabilization, the patient was transferred to an asylum seeker shelter.

Conclusion

This case highlights the complexity of managing migrant patients in healthcare system, where communication barriers and limited medical history may obscure the underlying etiology. Improved awareness of migration-related health risks are essential to ensure proper diagnosis and appropriate treatment.

Keywords: euglycemic ketoacidosis; global migration; rhabdomyolysis

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MINOR TRAUMA – MAJOR CONSEQUENCES: SEVERE TBI IN A GERIATRIC PATIENT; A CASE REPORT

***Mateo Bartolović[1], Erika Ptičar[2], Nina Lovrić[1-2], Martina Pavletić[1-2]**

Abstract

Traumatic brain injury (TBI) in geriatric patients represents a growing clinical challenge due to population aging, frailty, and reduced physiological reserve. Age-related cerebral atrophy increases the risk of intracranial bleeding even after low-energy trauma. Moreover, elderly patients often present with subtle or minimal neurological symptoms, which may lead to under-triage and delayed diagnosis. This case report aims to highlight the disproportionate severity of intracranial injury following minor head trauma in geriatric patients and emphasize the importance of early imaging and comprehensive clinical evaluation.

Case report

A 95-year-old female patient was brought to the emergency department after hitting the occipital region of her head against a door, preceded by an episode of dizziness. She denied loss of consciousness, nausea, vomiting, or falling. Her medical history included arterial hypertension treated with antihypertensive therapy. On admission, the patient was conscious, oriented, and neurologically intact, with a Glasgow Coma Scale score of 15. Physical examination revealed an occipital scalp laceration with a surrounding hematoma. Considering the patient's advanced age and mechanism of injury, an urgent head computed tomography (CT) scan was performed revealing a left supratentorial subdural hematoma measuring up to 12 mm with mild mass effect, a smaller interhemispheric acute subdural hematoma, and minimal subarachnoid hemorrhage in the Sylvian fissure. Imaging also demonstrated moderate chronic cerebral atrophy. Laboratory testing showed anemia with normal coagulation parameters, while neurological biomarkers were markedly elevated, supporting the diagnosis of traumatic brain injury. The patient was admitted to the neurosurgery department and treated conservatively with close neurological monitoring.

Conclusion

Minor head trauma in geriatric patients may result in extensive intracranial injury despite an initially preserved neurological status. Early CT imaging and individualized management are essential. Geriatric patients with TBI should be recognized as a distinct high-risk trauma population requiring tailored diagnostic and therapeutic strategies.

Keywords: elderly; traumatic brain injuries

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MISDIAGNOSED AS A PANIC ATTACK: A CASE OF ACUTE LARYNGEAL DYSTONIA AND AKATHISIA FOLLOWING ARIPIPRAZOLE LONG-ACTING INJECTABLE (LAI)

***Drinko Granić[1], Marija Kostanjski[1], Dora Meštrović[1]**

Abstract

A female patient received a scheduled aripiprazole depot injection in the morning and developed acute symptomatology by the afternoon. Symptoms were initially interpreted as a panic attack, prompting administration of diazepam 2 × 10 mg orally.

Case report

On arrival of the emergency medical team, the following findings were noted: 1. dysphonia with a strained voice quality, severe arm pain with hyperalgesia to touch (spasm, lactate accumulation) accompanied by clinically evident peripheral hypoperfusion of the upper extremities (pale, cold hands with delayed colour return). Capillary refill measured on the forehead was normal (0.5 s), indicating preserved central perfusion with isolated peripheral circulatory compromise. 2. Orthostatic hypotension with unmeasurable blood pressure and impalpable peripheral pulse upon sitting, with normal blood pressure supine, and tachycardia of 130-140/min. Presumed mechanism of dystonia is dopaminergic-cholinergic imbalance in the basal ganglia. Although aripiprazole is a partial D2 agonist with an inherently lower risk of extrapyramidal side effects, at high concentrations it functionally acts as a predominant antagonist-displacing endogenous dopamine (a full agonist) and replacing it with a weaker signal. Dystonia is a rare but recognised adverse effect of long-acting injectable (LAI) aripiprazole, with an incidence of 0-5.7% depending on dose. A systematic review of acute laryngeal dystonia identified only 45 cases in the literature across all antipsychotics, yet with reported cases of respiratory failure requiring intubation. The serotonergic component - a 5-HT1A/2A system imbalance - caused orthostatic hypotension with peripheral vasodilation and reflex tachycardia. Diazepam administered prior to the team's arrival synergistically worsened autonomic dysfunction by potentiating the alpha - 1 blockade of aripiprazole.

Conclusion

Dysphonia in a patient on antipsychotic therapy should raise suspicion for laryngeal dystonia. Akathisia and agitation following a depot injection must not be mistaken for psychiatric deterioration. The treatment of choice for acute dystonia is an anticholinergic agent (biperiden).

Keywords: aripiprazole; LAI; laringeal dystonia

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MORPHINE ADMINISTRATION IN THE EMERGENCY DEPARTMENT FOR DYSPNEA AT THE END OF LIFE

***Asher Taragin[1], Avigail Bar Tikvah[1], Meir Frankel[1]**

Abstract

Dyspnea is a common and distressing symptom at the end of life, particularly in patients with advanced cancer, heart failure, or chronic lung disease. Morphine effectively relieves dyspnea by modulating central perception of breathlessness and reducing respiratory effort. Despite evidence and guideline support, morphine remains underutilized in the emergency department (ED), suggesting barriers related to clinician awareness, attitudes, and comfort with end-of-life care. This study investigates patterns and determinants of morphine administration in the ED for end-of-life dyspnea and its association with patient outcomes.

Methods

We conducted a retrospective analysis of medical records of adult end-of-life patients presenting with dyspnea to the ED at Shaare-Zedek Medical Center, Israel, between 2023–2024. Demographic and clinical characteristics were analyzed statistically for the entire cohort

Results

A total of 250 patients were included (mean age 83.2 ± 11.5 years; 51.2 % female). Only 15.2% received morphine in the ED, whereas 68% received it during hospitalization. Multivariate logistic regression identified lung cancer (OR = 3.413, p = 0.022), DNR status (OR = 3.173, p = 0.010), and arrival pulse rate (OR = 1.022, p = 0.008) as significant predictors of morphine use in the ED. No significant difference in time to death was observed between patients who received morphine in the ED (mean 231.95 hours) and those who did not (mean 242.64 hours, p = 0.165). However, morphine use during hospitalization was associated with a significant increase in survival (mean 282.20 hours vs. 152.35 hours, p < 0.001).

Conclusion

Morphine remains significantly underutilized in the emergency setting, with only 15.2% of terminally ill patients receiving this treatment. Factors such as lung cancer, DNR status, and vital signs influence morphine use in the ED. Although morphine in the ED did not impact time to death, its use during hospitalization was associated with a meaningful extension in survival time.

Keywords: dyspnea; emergency; end-of-life care; morphine

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MYOCARDIAL CONTUSION FOLLOWING BLUNT CHEST TRAUMA REVEALING SEVERE MULTIVESSEL CORONARY ARTERY DISEASE: A CASE REPORT

***Maritea Arelić[1], Martina Pavletić[2], Mirjana Maras[2]**

Abstract

Blunt chest trauma may result in myocardial contusion, a potentially serious condition that can mimic acute coronary syndrome and pose significant diagnostic challenges. We present a case of myocardial contusion following blunt thoracic trauma, that led to the detection of previously undiagnosed severe multivessel coronary artery disease.

Case report

A 69-year-old male was admitted following a traffic accident caused by sudden loss of consciousness while driving. On admission, he reported chest pain and dyspnea, with a history of exertional chest discomfort in the preceding weeks. His medical history included arterial hypertension, chronic obstructive pulmonary disease (COPD), and long-term smoking. Laboratory testing showed markedly elevated cardiac troponin levels, consistent with acute myocardial injury. Electrocardiography showed nonspecific changes, while transthoracic echocardiography demonstrated mildly reduced left ventricular systolic function with global hypokinesia, consistent with myocardial injury. Based on the mechanism of injury and clinical presentation, myocardial contusion was considered as the primary cause of cardiac dysfunction. Computed tomography angiography of the thoracic aorta excluded traumatic vascular injury and aortic dissection. However, further diagnostic workup with coronary angiography revealed severe three-vessel coronary artery disease: approximately 40 % stenosis of the left main coronary artery, significant stenoses of the left anterior descending and right coronary arteries, and chronic total occlusion of the left circumflex artery. Pulmonary assessment confirmed severe obstructive ventilatory impairment consistent with COPD. The patient underwent multidisciplinary evaluation and supportive management. Due to significant coronary pathology and persistent myocardial dysfunction, surgical myocardial revascularization (coronary artery bypass grafting) was recommended.

Conclusion

This case highlights the diagnostic complexity of myocardial contusion after blunt chest trauma, particularly in patients with underlying coronary artery disease. Elevated cardiac biomarkers and ventricular dysfunction after trauma require comprehensive evaluation to distinguish traumatic myocardial injury from ischemic heart disease. Early recognition and multidisciplinary management are crucial for optimal outcomes.

Keywords: blunt chest trauma; cardiac injury; coronary artery disease; myocardial contusion

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NATURAL DISASTERS AS FACTORS IN THE OUTBREAK OF INFECTIOUS DISEASES - THEIR IMPACT ON THE PUBLIC HEALTH OF ALBANIANS, PART OF WESTERN EUROPE

***Ermira Muco[1], Jonida Kito[1], Neada Hoxha[2], Irena Ceko Marko[1]**

Abstract

The Balkan region, the western part of which Albania is part of, is exposed to natural disasters and consequently to major climate changes. Our country faces one of the highest levels of risk from natural disasters such as floods, earthquakes, landslides, etc. There is a close connection between natural disasters and the infectious diseases that break out after them.

Aim and Method

To identify the existing link between natural disasters and infectious pathologies. We conducted an extensive search in five main databases: PubMed, Google Scholar, Scopus, Science Direct and Web of Science, synthesized the literature that helped us describe the epidemiological and clinical profile of possible infectious diseases and their causative microorganisms. We collected our data from the reports of the Institute of Public Health (IHP), the Ministry of Health, local government and Institute of Statistics (INSTAT) etc.

Results

Our country faces one of the highest levels of risk from natural disasters. Infectious diseases that break out after natural disasters develop from local pathogenic microorganisms, as well as depending on the type of disaster, the weather when it occurs, the hygienic and sanitary conditions of the local population. Climate change with heavy rainfall have been factors for the increase in the incidence of Leptospirosis in the city of Shkodra and the municipalities bordering Montenegro. Springs with torrential rains increase the risk of West Nile Fever transmission, as well as in the region. Tetanus and measles are health problems in our country and the risk of their transmission increases.

Conclusion

Natural disasters and their cascading effects pose serious challenges to public health. Developing countries are more affected because they lack resources, infrastructure, and preparedness systems. Protecting populations in disaster areas from the outbreak and spread of infectious diseases is essential. All health care sectors must coordinate their efforts in this difficult mission.

Keywords: Albania; disaster; infectious; natural; region

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NEW KID ON THE BLOCK – DIAGNOSTIC AND PROGNOSTIC FEATURES OF SERUM CALPROTECTIN IN PATIENTS WITH SEPSIS

***Điđi Delalić[1], Višnja Nesek Adam[1]**

Abstract

Early diagnosis and initiation of treatment is of paramount importance in sepsis. Although significant efforts and advancements have been made during the last two decades in the field of sepsis diagnosis research, the search for a sepsis biomarker with optimal diagnostic features is still ongoing. The aim of this study is to determine the diagnostic features of calprotectin in patients with sepsis and compare them to those of c-reactive protein (CRP), procalcitonin (PCT) and leukocytes (LKC).

Methods

This was a single-centre prospective observational study. Patients were enrolled from 7/2023 to 2/2024. The inclusion criteria were age >18 and a diagnosis of sepsis based on the Sepsis-3 criteria. Pregnant patients and patients unable to consent to enrollment were excluded from the study. Two vials of blood were sampled from the enrolled patients on hospital admission and a "sepsis panel" was conducted, determining the serum concentrations of calprotectin, CRP, PCT and leukocyte count. The sepsis panel was repeated in each patient on days 1 and 3 of their hospital stay. Data were analyzed using Jamovi version 2.66.44.

Results

Serum calprotectin measured on admission displayed an AUROC of 0,79 for diagnosing sepsis, which was superior to both serum CRP (AUROC 0,556) and PCT (AUROC 0,522) and leukocyte count (AUROC 0,759). Using a cut-off value of >7,02 µg/mL, serum calprotectin on admission displayed a sensitivity of 82,93 % and a specificity of 61,11 %.

Conclusion

Serum calprotectin measured on hospital admission demonstrates promising diagnostic accuracy for the early diagnosis of sepsis, outperforming conventional biomarkers of sepsis such as CRP, PCT and leukocyte count.

Keywords: diagnostic features; procalcitonin; sepsis

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A CASE OF SUPERIOR MESENTERIC VEIN VOLVULUS INITIALLY INTERPRETED AS UNPROVOKED SUPERIOR MESENTERIC VEIN THROMBOSIS IN AN ADULT FEMALE

***Sophia Wong**[1]

Abstract

In volvulus, intestines twist upon themselves, leading to intestinal obstruction. Radiologic features of volvulus include: a 'corkscrew' effect of the small bowel, and the superior mesenteric vessels twisting around the mesenteric base. As intestinal malrotation is a predisposing factor, volvulus is more common in children and infants. Case reports of volvulus in adults are otherwise rare, and the CT scans done included typical radiologic findings. We present a rare case of an adult female who was initially diagnosed with unprovoked Superior Mesenteric Vein (SMV) thrombosis, later re-evaluated to be SMV volvulus - this patient lacked the typical CT features of volvulus.

Case report

The patient had a previous subtotal colectomy done for colonic volvulus, and an unknown abdominal surgery done during childhood. She presented with severe abdominal pain and vomiting, with no other features of intestinal obstruction or infection. A CT abdomen and pelvis (CTAP) reported severe attenuation of the SMV. There was otherwise no frank bowel ischemia or volvulus noted. The diagnosis of unprovoked SMV thrombosis was made, and the patient was started on anticoagulation. The patient had no risk factors for thrombosis, and a d-dimer done, though abnormal, was not high enough to definitively rule in thrombosis. A CT mesenteric angiogram (CTMA) done 3 days after showed no evidence of thrombosis. It was noted that the patient's remnant colon had changed position between the admission CTAP and the subsequent CTMA - this 'volvulus' could have caused the initial SMV attenuation. The diagnosis was revised to 'SMV volvulus'.

Conclusion

In patients with altered anatomy secondary to previous abdominal surgeries, it is important to consider that conditions with known pathognomonic radiographic findings may present with atypical radiographic features, and alternative diagnoses should be sought if the patient possesses no risk factors for the initial primary diagnosis.

Keywords: atypical radiographic features; SMV; thrombosis; volvulus

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A PRACTICAL APPROACH TO EMERGENCY DEPARTMENT MANAGEMENT OF EXERTIONAL ENDURANCE EVENT CASUALTIES

***Jeevan Raaj Thangayah**[1]

Abstract

Endurance events can potentially generate casualties at a surge rate which strains current emergency departments' (EDs) capacity to function optimally and reach appropriate a disposition for exertional heat illness (EHI) casualties. The wide spectrum of clinical presentation of EHIs (from heat cramps to cardiovascular collapse as in heat stroke) compounded by the influx of patients during large scale events can invariably cause cognitive overload on emergency physicians which can affect patient throughput. To manage these cases efficiently, we utilized the 3S approach - staff, stuff, and space and to triage, treat and monitor them within the confines of our limited ED floor space. This included demarcation of dedicated areas to manage stable patients, revamping the doctors' duty roster during event days to align with the peak of casualty arrival, stocking up on cooling devices and equipment and creating a dedicated treatment protocol for EHI patients in our observation unit. This pilot service had a positive outcome where we able to avoid unnecessary admission to the inpatient wards for 77 % of the patients (7/9) on the day of a major marathon event in Singapore in 2025. We received 12 casualties in total; 2 required intensive care and 1 died- these 3 were excluded from the pilot. Out of the 7 patients 3 (42.8 %) were successfully discharged from the observation unit the next day, 3 were transferred to the inpatient ward for continued management and 1 was discharged to hospital-at-home service. With dedicated support from the hospital and a consolidated effort, emergency physicians and nurses can contribute effectively to improve the throughput of EHI patients without compromising on the quality of care.

Conclusion

Emergency departments should anticipate an influx of casualties from major endurance events including mass marathons where large numbers of exertional heat illness (EHI) patients can inundate the limited resources.

Keywords: emergency management; exertional heat stroke

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A RETROSPECTIVE ANALYSIS OF POLYTRAUMA PATIENTS IN THE EMERGENCY DEPARTMENT (ED) OF A TERTIARY HOSPITAL CENTRE IN ZAGREB, CROATIA, FROM OCTOBER 2025 THROUGH JANUARY 2026

***Krešimir Rukavina[1], Paola Bajlo[1], Matea Bingula[1], Laura Kustura[1], Mirna Alvir[1], Ivan Gornik[1-2]**

Abstract

According to available data, trauma is the leading cause of death and disability in European countries, especially among individuals younger than 40 years of age. Road traffic injuries (RTI) are the major trauma cause, followed by interpersonal or self-inflicted violence and other unintentional mechanisms of injury. We've decided to obtain real-world data regarding trauma patients referred to our emergency department (ED) to improve patient care and outcomes.

Methods

During a four-month period, 226 first triage-category patients were transported to our ED by prehospital emergency medical teams (EMTs) for various conditions, including trauma, stroke, and cardiac arrest. A retrospective review of electronic health records of 203 patients was performed (23 patients were excluded due to incomplete data) to detect and analyse trauma patients' data.

Results

Trauma patients accounted for 17,7 % of the analysed cohort (36/203). Among these trauma patients, 18 out of 36 met criteria for polytrauma (PT). Fifty percent of PT patients were women, and three out of eighteen PT patients were minors. The predominant mechanism of injury was RTIs (11/18; 61 %). Other causes included unintentional falls (3/18), occupational injuries (2/18; both in construction), one suicide attempt, and one case of domestic violence. Prehospital immobilization was performed in accordance with standard trauma protocols in 16/18 cases. Focused assessment with sonography in trauma was performed in 13/18 cases, and a CT scan was obtained in all patients. One patient died during resuscitation in the ED; the remainder were admitted for in-hospital care. Subsequently, almost all patients were discharged home; only one patient remains hospitalized at the time of analysis.

Conclusion

The analysis of real-world data provides valuable feedback on the quality of prehospital, emergency department, and in-hospital trauma care, while simultaneously identifying areas that require improvement to optimize patient outcomes. These findings can be a good foundation for a comprehensive trauma registry.

Keywords: patient outcomes; polytrauma; trauma registry

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A SMALL BITE OF NEGLECT: A CASE OF RABIES IN THE EMERGENCY ROOM

***Ahmet Celal Özsoy**[1]

Abstract

Rabies is a zoonotic disease that progresses rapidly and fatally after high-risk exposure but can be prevented with prophylaxis. We present a pediatric case that was admitted to our emergency department with suspected rabies and subsequently died, in order to highlight the importance of prophylaxis in cases of rabies exposure.

Case report

A 9-year-old male patient was brought to our emergency department by his family with complaints of fever, altered consciousness, and intermittent muscle spasms throughout his body. He had no known medical history or history of trauma. Upon arrival, the patient was drowsy. His vital signs showed a temperature of 40°C. Physical examination revealed nuchal rigidity. There were no additional neurological deficits. No additional focus was identified in terms of the source of the fever. A central nervous system infection was initially suspected. Cranial tomography and magnetic resonance imaging revealed no pathology. Upon re-examination, a 3 cm scar in the frontal region caught our attention. Upon further questioning, it was learned that the patient had been bitten by a dog approximately 1.5 months prior but had not received a rabies vaccination. The patient developed hydrophobia during follow-up. Lumbar puncture ruled out other causes of encephalitis. Consequently, the patient was transferred to the pediatric intensive care unit with a provisional diagnosis of rabies. The lumbar puncture and saliva analysis results did not provide a definitive conclusion. The patient died on the 10th day of treatment. The autopsy confirmed that the patient died due to rabies.

Conclusion

Although rabies has been known worldwide since ancient times, it continues to cause serious deaths. Approximately 65,000 deaths are reported worldwide each year. Rabies, which remains a significant public health issue worldwide, is a disease that can be prevented through vaccination, monitoring of at-risk animals, and public education.

Keywords: emergency medicine; infectious; pediatric; rabies

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ABDOMINAL PAIN AS A DIAGNOSTIC CHALLENGE: APPENDICITIS OR PYELONEPHRITIS?

***Zdravka Majić**[1]

Abstract

Abdominal pain is one of the most common symptoms among patients presenting to the emergency department and represents a significant diagnostic challenge in everyday clinical practice. Among the many causes of acute abdominal pain, appendicitis and pyelonephritis occupy an important place due to their frequency, the possibility of overlapping symptoms, and the need for early and accurate diagnosis, which determines the choice of therapeutic approach and treatment outcome. Timely differentiation between appendicitis and pyelonephritis is crucial for selecting appropriate therapy and preventing potential complications.

Case report

A 23-year-old female patient presented to the emergency urology department with right-sided lumbar pain accompanied by subfebrile temperature. A suspicion of non-obstructive pyelonephritis was established, and oral antibiotic therapy was initiated. Despite treatment, her clinical condition deteriorated, with worsening pain, development of high fever, and general malaise. Imaging studies (abdominal ultrasound and MSCT of the abdomen and pelvis) revealed signs of acute appendicitis and right-sided pyelonephritis, and the patient was subsequently hospitalized in the Department of Abdominal Surgery. During hospitalization, she was also evaluated by an infectious disease specialist, and antibiotic therapy was adjusted, leading to gradual clinical improvement and a decrease in inflammatory markers. She was discharged home in good general condition, with a recommendation for outpatient surgical follow-up.

Conclusion

The presented case highlights the importance of a multidisciplinary approach in the management of patients with nonspecific abdominal symptoms, in which collaboration among urologists, surgeons, radiologists, and infectious disease specialists was crucial for optimal care. Systematic diagnostic evaluation, dynamic clinical monitoring, and multidisciplinary cooperation represent the foundation of successful management of patients with abdominal pain, particularly in cases of atypical presentation and overlapping symptoms of different organ systems.

Keywords: abdominal pain; appendicitis; pyelonephritis

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ABDOMINAL PENETRATING INJURY BY A METALLIC PROJECTILE: CLINICAL PRESENTATION AND THERAPEUTIC APPROACH

***Mirjam Majstorović[1], Nina Lovrić[2]**

Abstract

Gunshot wounds are complex injuries with tissue damage depending on projectile's velocity, transferred kinetic energy, and the biomechanical properties of the tissue, particularly its water content. Shock waves during penetration cause tissue stretching and necrosis that often exceeds the visible wound margins. In abdominal trauma, the small and large intestines, liver, and intra-abdominal vessels are most commonly affected.

Case report

A 55-year-old female presented to the Emergency Department, after experiencing sudden, sharp pain and a burning sensation in her abdomen. She reported that the pain started while she was walking along a promenade watching and hearing distant fireworks, with the impression of an object penetrating her abdomen. On examination, a periumbilical punctate entry wound (0.5 × 0.5 cm) with a surrounding spindle-shaped hematoma (4 × 6 cm) was noted. Subcutaneous tissue without active bleeding was visible and the abdomen was tender only locally. Focused assessment with sonography for trauma (FAST) ultrasound was negative. CT imaging revealed a 16 mm metallic foreign body lodged in the anterior abdominal wall with multiple small fragments and a localized hematoma. According to local protocol, the wound was irrigated and the foreign body removed under local anesthesia. She received tetanus prophylaxis, broad-spectrum parenteral antibiotic therapy, and analgesia. The wound healed by primary intention, and the patient made a full recovery.

Conclusion

This case highlights that abdominal gunshot injuries can appear minor externally while conceal significant internal damage. Management requires careful evaluation of the injury mechanism and awareness of possible discrepancies between external and internal findings. Urgent laparotomy is indicated for patients with intraperitoneal bleeding, peritonitis, or clinical deterioration, while selected cases with isolated, low-velocity injuries may be managed conservatively.

Keywords: abdominal injuries; penetrating wounds

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ACTIVE METHODOLOGY AND THE KIRKPATRICK MODEL IN THE ASSESSMENT OF CLINICAL AND COGNITIVE SKILLS IN THE EMERGENCY INTERNSHIP – UNIVERSITY OF RIBEIRÃO PRETO – BRAZIL

***Rosemary Furlan- Daniel[1]**

Abstract

Simulation as an active methodology is a teaching strategy applied in medical education. It develops training, technical skills, management, and competencies related to patient safety and teamwork. Based on kirkpatrick model, technical training assesses the student's reactions, learning, and behavior, and its impact on medical care. The three emergency medicine intership (495 total hours) of the medical course at the University of Ribeirão Preto (Brazil) are included in the fifth and sixth years of the undergraduate program.

Objective

Use of simulation and the kirkpatrick model for training in clinical and cognitive skills in students of emergency intership. To evaluate the students' progress, identifying strengths and areas for development in other emergency intership.

Methods

65 students were divided into 6 groups and performed the simulation in pairs at the beginning and end of internship (165 hours). Evaluation took place between July and December 2025. Simulation: briefing, simulation, debriefing, and feedback. Debriefing - using the Pearls model (safe environment and basic assumption). Qualitative assessment was performed using a checklist with a score of 0-5. Skills assessed: clinical - care and physical examination; cognitive - diagnosis and treatment.

Results

Average Pedagogical Effectiveness: emergency internship demonstrates high effectiveness in the sample analyzed. The overall average of the groups in the final assessment is higher than the initial average. Diagnosis/Treatment: The analysis showed that, although students improve in consultation and physical examination skills, the variables diagnosis and Ttreatment are the areas of greatest inconsistency.

Conclusion

With the use of this active methodology and the kirkpatrick model, we were able to efficiently assess the evolution of the student's clinical and cognitive skills. The development of cognitive skills should be intensified. The students were able to identify the skills that should be developed.

Keywords: medical education; simulation; kirkpatrick model

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ACUTE CARBON MONOXIDE POISONING - RECOGNIZING KEY SIGNS AND SYMPTOMS IN PREHOSPITAL EMERGENCY MEDICINE

***Ana Katić[1], Hana Ćurtović[1], Antonio Šegota[1], Karolina Beg[2]**

Abstract

Carbon monoxide (CO) is a poisonous gas formed by the incomplete combustion of carbon fuels and is one of the leading causes of accidental poisoning, causing approximately 30 deaths in Croatia every year. It binds to hemoglobin with approximately 200 times the affinity of oxygen, causing hypoxemia and symptoms such as headache, dizziness, nausea, vomiting, dyspnea, spasms, and syncope.

Case report

Two foreign workers aged 29 and 37 were brought to an outpatient emergency service by a neighbor who reported they had lit a fire in an old fireplace but soon became unwell. They complained of dyspnea, dizziness, headache, and muscle spasms. On examination, both patients were conscious but visibly distressed and tachypneic. Vital signs showed blood pressure of 154/95 mmHg and 130/95 mmHg, heart rate of 72 beats per minute (bpm) and 114 bpm, and oxygen saturation of 98 % and 97 % in the younger and older patient, respectively. Both had unremarkable heart and lung exams, with no focal neurological deficits. However, both exhibited bilateral carpopedal spasms, and the younger patient additionally reported a brief syncopal episode. Peripheral perfusion was assessed at the palms and conjunctivae, where pink discoloration was pronounced. Considering the constellation of clinical signs and symptoms, acute CO poisoning was suspected, which prompted quick transfer to the hospital and initiation of 15 L/min oxygen for both via a non-rebreather mask. During in-hospital evaluation, elevated carboxyhemoglobin levels of 27,7 % and 23,5 % were revealed, which confirmed the diagnosis of acute CO poisoning.

Conclusion

This case shows the importance of thorough history-taking, physical examination, and sound clinical reasoning in the setting of limited diagnostic resources and sometimes difficult communication with patients in prehospital emergency medicine. Exposure history and careful interpretation of signs and symptoms were essential for diagnosing CO poisoning and timely treatment of these patients, ultimately leading to good outcomes.

Keywords: carbon monoxide; dyspnea; hypoxia

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ACUTE CONGESTIVE HEART FAILURE PREDICTS NEGATIVE CT PULMONARY ANGIOGRAPHY IN THE EMERGENCY DEPARTMENT: A SINGLE-CENTER RETROSPECTIVE ANALYSIS

***Nika Rakusa[1], Ivan Gornik[1]**

Abstract

Pulmonary embolism (PE) suspicion drives high CT pulmonary angiography (CTPA) use in emergency departments (EDs), but yields vary with comorbidities like acute congestive heart failure (AcHF). We assessed AcHF as a predictor of negative CTPA to optimize imaging.

Methods

Retrospective analysis of 1555 CTPAs (2023) at a tertiary Croatian ED for respiratory symptoms. AcHF was defined by pulmonary congestion (ultrasound/X-ray) plus elevated age-adjusted NT-proBNP. Odds ratios (OR), logistic regression, and ROC for D-dimer were calculated.

Results

Overall PE yield: 17.9 % (278/1555). AcHF patients (207/1555, 13.2 %) had PE in 3.5 % (OR 0.141, 95 % CI 0.065-0.302; no cases without cancer/on OAC). AcHF independently predicted negative CTPA (OR 0.132). D-dimer ROC in AcHF: AUC 0.900; 3.68 mg/L cutoff: 100 % sensitivity, 56.6 % specificity.

Conclusion

AcHF markedly lowers PE likelihood on CTPA due to opposing hemodynamics. Higher D-dimer cutoffs safely reduce unnecessary scans, cutting radiation/contrast risks. Refine guidelines to prioritize CTPA for unexplained symptoms.

Keywords: ACHF; CTPA; D-dimers; pulmonary embolism

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ADRENAL CRISIS: A CRISIS TRIGGERED BY LEVOTHYROXINE IN HYPOTHYROIDISM

***Julia Grgurić[1], Anamarija Madunić[1], Paula Franić[1], Nikola Klarić[1], Ozana Bujas Padovan[1]**

Abstract

Adrenal crisis is a life-threatening endocrine emergency resulting from acute adrenal insufficiency. It may occur as the initial presentation of undiagnosed adrenal insufficiency. In patients with autoimmune hypothyroidism, it can be precipitaded by introducing levothyroxine therapy. The clinical picture is characterized by significant hypotension accompanied by nonspecific symptoms such as nausea, vomiting, abdominal pain, and fatigue.

Case report

A 33-year-old female patient presented to the emergency department with abdominal pain, nausea, and vomiting. The patient had a history of autoimmune hypothyroidism and had been prescribed a higher dose of levothyroxine over the previous two weeks because of high thyroid stimulating hormone (TSH) levels. She experienced cramping pain in the upper abdomen with an intensity of pain, Visual Analog Scale (VAS) 8/10. On clinical examination, the patient was hypotensive and tachycardic, with pale skin and weakly palpable peripheral pulses. Her abdomen was soft, diffusely tender on palpation, with quiet peristalsis. Laboratory results revealed severe hyponatremia and hyperkalemia, along with acute prerenal kidney damage. The patient was hospitalized in the intensive care unit. The diagnosis of primary adrenal insufficiency was confirmed by low cortisol levels without an increase in the Synacthen test, along with elevated adrenocorticotropic hormone (ACTH) levels and low dehydroepiandrosterone sulfate (DHEA-S). MRI of the adrenal glands was performed and was normal. The patient was treated with corticosteroid replacement therapy using hydrocortisone and fludrocortisone, along with fluid replacement using saline. During the remainder of the hospitalization, the patient remained stable and was discharged home with a recommendation for outpatient endocrinology follow-up.

Conclusion

In patiens with hypothyreoidism, levothyroxine therapy increases metabolic activity and enhances hepatic corticosteroid metabolism, leading to low cortisol levels and adrenal insuffiency. It is important to rule out primary adrenal insuffiency in patients with hypothyroidism because of the risk of adrenal crisis. It is a severe medical condition with a substantial mortality rate that requires immediate recognition and intervention.

Keywords: adrenal insufficiency; hypothyroidism; levothyroxine

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AIRWAY MANAGEMENT IN A PATIENT WITH NEUROTRAUMA

***Željka Berbić**[1]

Abstract

Neurotrauma are leading cause of mortality and disability in the younger population. Among these injuries, acute subdural hematoma is an entity with a particularly poor prognosis, especially if associated with primary parenchymal damage, high intracranial pressure, and hemodynamic instability. Optimal airway management is essential to prevent secondary brain injury. Airway management in these patients is further complicated by the presence of trismus, facial injury, and potential cervical spine injury.

Case report

Case report 1: Young girl, 20 years old, involved in a traffic accident as a quad. On initial examination, the patient was unconscious, breathing on her own, Glasgow coma score (GCS) 6 (E1, V2, M3), tachycardic with a pulse of about 120/min, normotensive 120/70, hypothermic. No visible external injuries. Pupils right wider than left. Trismus present, which complicates securing the airway. During transport to emergency departement, assisted ventilation with a mask, the patient was breathing on her own, only assistance with deepening some breaths. Rapid sequence intubation (RSI) was not performed due to the lack of medication in the ambulance.

Case report 2: A 60-year-old man, injured in a traffic accident due to a collision with a car. The first examination showed the patient to be unconscious, GCS 7 (E2, V2, M3), breathing shallowly and irregularly, the extremities becoming cyanotic. Tachycardia pulse around 130/min, hypertensive around 180/90 mmHg. The examination revealed no visible external injuries. Due to the patient's vital signs and the distance from the Osijek Clinical Hospital, the helicopter emergency medical service (HEMS) was called. After their arrival at the scene of the accident, the patient's airway was secured by rapid sequence intubation and connected to a transport ventilator.

Conclusion

Traumatic brain injury is one of the leading causes of death and long-term disability. It is necessary to start with airway management in the field with the aim of preventing hypoxia and the occurrence of secondary brain injury.

Keywords: airway management; neurotrauma; RSI

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AIRWAY MANAGEMENT IN PREHOSPITAL CARDIAC ARREST

***Tomislava Mrgan[1], Hana Ćurtović[1], Lovro Jančić[1]**

Abstract

Securing the airway in out-of-hospital cardiac arrest ensures airway patency and adequate patient oxygenation. Basic airway management techniques include head tilt-chin lift, insertion of an oropharyngeal or nasopharyngeal airway, while definitive airway management requires the use of supraglottic airway devices or an endotracheal tube. Although endotracheal intubation (ETI) has traditionally been considered the gold standard for airway management in both in-hospital and prehospital settings, its use in the prehospital environment has declined over time, accompanied by an increasing trend toward the use of supraglottic airway devices (SGA). At the Karlovac County Emergency Medical Service (EMS), during a one-year period, a total of 80 patients with out-of-hospital cardiac arrest (OHCA) underwent resuscitation. In 62 patients, the airway was secured using a supraglottic device (SGD). Return of spontaneous circulation (ROSC) was achieved in 13 of these patients. ETI was performed in 13 patients: as a primary airway management technique in 6 patients; in 6 patients following initial placement of an I-gel; and in 1 patient in whom ETI was attempted but unsuccessful, after which the airway was secured with an I-gel device. No cases of ROSC were recorded among patients in whom ETI was performed.

Conclusion

Currently, there is no clear evidence favoring more invasive airway management approaches. Specifically, no significant differences have been demonstrated in ventilation or perfusion markers, prehospital ROSC rates, or survival outcomes between patients whose airway was secured with ETI versus SGA. In addition, it is important to emphasize the significance of the first-pass success rate and the clinical experience of the physician within the emergency medical team in airway management. Therefore, when airway management is performed by inexperienced medical personnel, SGA devices are generally preferred to maintain a high first-pass success rate, thereby facilitating optimal airway management outcomes for patients.

Keywords: endotracheal tube; OHCA; supraglottic device

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ALCOHOLIC CARDIOMYOPATHY: A CASE REPORT PRESENTATION

***Sonil Marko[1], Irena Ceko Marko[2], Rudina Preci[2], Llukan Rumbullaku[3]**

Abstract

Alcoholic cardiomyopathy is a form of acquired cardiomyopathy, associated with daily alcohol consumption of more than 80 g/day for a period of over 5 years. According to studies, its pathophysiology includes direct oxidative damage from ethanol and its metabolites, primarily acetaldehyde, as well as activation of the renin-angiotensin-aldosterone system.

Case report

This is a case report of a 35-year-old male patient with a 20-year history of alcohol consumption (Alcohol use disorders identification test, AUDIT > 25), who presented to the emergency department with difficulty breathing, oedema and numbness of the extremities, thoracic and abdominal discomfort, jaundice and physical weakness. The methodology of this study includes a comprehensive literature review followed by a detailed case report presentation.

Conclusion

This case study clearly shows the correlation between high levels of alcohol use and the development of dilated cardiomyopathy in a young age with multiorgan involvement. This case underlines the need to perform a thorough examination of heart function. Imaging, particularly echocardiography, and the exclusion of alternate structural and ischaemic aetiologies reveal alcohol as the primary cause of this particular form of cardiomyopathy.

Keywords: alcoholic cardiomyopathy; ethanol; heart failure

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AN ATYPICAL NEUROPSYCHIATRIC PRESENTATION OF CHRONIC COCAINE ABUSE

***Milenica Rosić[1], Martina Pavletić[2], Nina Lovrić[2]**

Abstract

Psychoactive substances are classified as depressants, stimulants, or hallucinogens based on their primary pharmacological effects. Cocaine is a potent central nervous system stimulant that inhibits dopamine reuptake, resulting in increased synaptic dopamine concentrations. Dopamine regulates reward pathways, mood and motor function. Cocaine produces marked systemic effects, including vasoconstriction, mydriasis, hyperthermia, tachycardia, and hypertension. Common complications include headache and gastrointestinal disturbances while the most severe outcomes – such as myocardial infarction and ischemic stroke – are associated with significant mortality.

Case report

A 24-year-old male was transported by emergency medical service to the emergency department after experiencing a generalized tonic-clonic seizure with loss of consciousness, generalized convulsions and tongue biting. On admission, he complained of weakness, fatigue, back muscle spasms, intermittent chest pain, and dizziness. In the three days preceding admission, he had not slept and exhibited psychomotor agitation with visual hallucinations, describing conversations with his deceased grandmother. Neurological and physical examination were unremarkable. He had no significant past medical history and was not on chronic medication. Laboratory testing was negative, as well as brain computed tomography showed no acute intracranial pathology. Due to a high suspicion of possible drug abuse, further toxicological analysis was performed and confirmed cocaine consumption. After confronting him with the results, he admitted heavy cocaine use over six months, escalating to daily intake of 2-3 grams during the last four months. He also reported regular smoking and occasional alcohol use.

Conclusion

Although cocaine is primarily classified as a stimulant, hallucinations may occur as a complication of chronic high-dose use. This case highlights the neuropsychiatric risks associated with prolonged cocaine exposure. The clinical management of patients with substance use disorder requires particular caution, especially considering the increasing prevalence of adulterated and combined illicit substances, which may alter clinical presentation and increase complication rates.

Keywords: cocaine abuse; substance-induced visual hallucinations

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IDENTIFYING THE CAUSE OF A PATIENT'S DYSPNEA DURING A MEDICAL HELICOPTER FLIGHT, OR EVERYTHING WE NEED TO KNOW ABOUT B LINES

Ivan Brdar[1]

Abstract

Patients with a subjective feeling of shortness of breath, especially when they have pronounced and significant hypoxemia, represent a group of acute patients with a frequent indication for the activation of the helicopter emergency medical service (HEMS). Normally, an important part of the clinical assessment of these patients' condition is lung auscultation, which is rarely possible during HEMS intervention.

Case report

HEMS at the Brač base received a call for a 68-year-old patient with hours-long shortness of breath. His chronic illnesses are heart failure, chronic obstructive pulmonary disease (COPD), and hypertension. After landing, the team performed a quick check. His respiratory rate was 26/min, oxygen saturation was 78%, and the ECG showed sinus tachycardia at 115/min. Oxygen was given, then an ultrasound exam was done. The exam showed more than 3 B lines in the intercostal spaces anteriorly and laterally in both lungs. There were pleural effusions. The inferior vena cava measured 2.6 cm and collapsed <50 % on inspiration. Since these showed clear signs of heart failure, the patient received intravenous furosemide (60 mg) and sublingual nitroglycerin (2 puffs) early.

Conclusion

This case highlights that, although an ultrasound examination in a helicopter during flight is associated with several aggravating factors, various studies confirm that LUS in this environment typically takes about 60 seconds. While B-lines indicate pulmonary edema, they are not always cardiogenic; conditions such as acute respiratory distress syndrome (ARDS) and viral pneumonia can also cause B-lines. Therefore, it is important to assess the pleura and the distance between the B lines, keeping the patient's clinical condition in mind. For instance, bilateral B lines in multiple intercostal spaces without pleural effusions indicate the possibility of pulmonary fibrosis or viral pneumonia. In such scenarios, point-of-care ultrasound (POCUS) allows for an early, correct diagnosis and shortens the time to appropriate therapy.

Keywords: HEMS; heart failure; lung ultrasound

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AIRWAY MANAGEMENT IN CRITICALLY ILL PATIENTS: WHO SECURES THE AIRWAY AND WHEN? A PREHOSPITAL–HOSPITAL ANALYSIS FROM A TERTIARY-LEVEL CENTRE

***Paola Bajlo[1], Krešimir Rukavina[1], Mirna Alvir[1], Matea Bingula[1], Laura Kustura[1], Ivan Gornik[1]**

Abstract

Airway management represents the first and most critical step in the treatment of critically ill patients. Continuity of assessment and interventions between prehospital emergency medical services and the emergency department (ED) is essential for patient safety and outcomes. The aim of this study was to analyse airway management in the prehospital setting and the need for escalation of airway interventions after hospital arrival.

Methods

A prospective analysis of preliminary data collected in the ED of the University Hospital Centre Zagreb was performed for the period from October 2025 to 31 January 2026. All patients announced as critically ill and transported to the ED were included. Airway management in the prehospital phase and subsequent hospital interventions were analysed.

Results

A total of 203 patients were included. In the prehospital setting, airway management with a supraglottic device (i-gel) was performed in 13 patients (6 %), while endotracheal intubation was performed in 2 patients (1 %). Most patients were transported with a secured airway and supported with oxygen therapy and basic airway management. In the emergency department, endotracheal intubation was performed in 33 patients (16 %). Of these number, 31 patients (15 %) were transported without advanced airway management and were intubated only after hospital arrival. These patients predominantly presented with severe neurological impairment, post-resuscitation status, or respiratory deterioration. Within the group intubated only after arrival to the emergency department (n=31), the majority required further intensive care treatment (68 %), with an in-hospital mortality of 23 %, while 9 % were stabilised and admitted to hospital wards.

Conclusion

Preliminary data suggest that definitive airway management in a substantial proportion of critically ill patients is performed in the hospital rather than in the prehospital setting. These findings highlight the importance of early airway assessment, structured pre-notification, and adequate preparation of the emergency department team for rapid escalation of airway interventions upon patient arrival.

Keywords: airway management; critically ill patients; intubation

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ALCOHOL USE AND TREATMENT SERVICES: HISTORICAL CONTEXT, PUBLIC HEALTH IMPACT, AND TREATMENT SYSTEM MAPPING IN ALBANIA

***Irena Ceko Marko[1], Sonil Marko[1], Ilir Alimehmeti[1]**

Abstract

Alcohol consumption remains one of the most widely used psychoactive behaviors globally and a significant contributor to morbidity and mortality. Despite deep cultural roots and social acceptance, alcohol use is associated with substantial health, social, and economic consequences.

To review the historical context and public health burden of alcohol use and to map the current treatment system for alcohol-related disorders in Albania.

Methods

A narrative review combined with treatment system mapping was conducted using World Health Organization (WHO) and United Nations Office on Drugs and Crime (UNODC) reports,, national statistics, legal frameworks, and institutional data describing alcohol treatment services in Albania.

Results

Albania provides universal healthcare services with emergency, clinical toxicology service, mental health, community-based, and residential rehabilitation structures addressing alcohol-related disorders. Acute care services are relatively well established, particularly emergency and inpatient detoxification services. However, integrated long-term addiction treatment and structured psychosocial rehabilitation remain limited.

Conclusion

Alcohol-related harm represents a growing public health concern in Albania. Strengthening prevention strategies, expanding multidisciplinary community-based services, and improving continuity of care across treatment levels are essential for reducing alcohol-related morbidity and mortality.

Keywords: alcohol use disorder; health system

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AN ATYPICAL CAUSE OF ARM PAIN AFTER PLANKING

***Timothy Wong**[1]

Abstract

Acute aortic dissection is a rare but catastrophic condition. Risk factors for non-traumatic aortic dissection include any cause of a sudden large increase in blood pressure such as weight-lifting and possibly with a Valsava maneuver during exercises.

Case report

A 58-year-old Chinese male with a abstract of type 2 diabetes, hypertension, hyperlipidaemia presented with left elbow pain after doing a planking exercise for 45 minutes. He then developed numbness and weakness over his left arm. There were no visual symptoms, headache, changes in speech, or neurological symptoms in the other limbs. There were no trauma or head injury, symptoms of chest pain, shortness of breath, abdominal or back pain. His vital signs were: temperature 36.6 °C, blood pressure of 129/66 mmHg, pulse rate of 80 beats per minutes, respiratory rate of 17 breaths/minute, oxygen saturation of 98 % on room air. Physical examination was significant for a pale and cool left arm that had a delayed capillary refill time of 4 seconds and a weak radial pulse. There was a radio-radial delay, and the left upper limb muscles were weaker Medical Research Council (MRC) grade 2/5 than the muscles in the other limbs. Capillary blood glucose and Chest X-ray were normal and the ECG showed normal sinus rhythm. A point-of-care ultrasound did not show a pericardial effusion or proximal abdominal aortic aneurysm/flap (limited window). Urgent CT scans of the head, aortogram and angiography showed an extensive Stanford A aortic dissection. He underwent type A aortic dissection repair with ascending aorta replacement and resuspension of aortic valve and and was discharged 12 days later.

Conclusion

Patients with aortic dissection may present with a myriad of symptoms, including limb pain and weakness after sports and exercise. It is important to acknowledge the limitations of bedside ultrasound and to utilize advanced imaging modalities to confirm the diagnosis.

Keywords: aortic dissection; stroke; valsalva maneuver

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AN UNCOMMON CAUSE OF HEADACHE

***Timothy Wong[1]**

Abstract

Headache is a common symptom in children. It is important to take a comprehensive history and performed a detailed physical examination. A wide range of differential diagnoses should be considered to exclude life-threatening causes.

Case report

A 16-year-old Malay female presented with fever, headache and altered mental status. She had a normal vaginal delivery to a 39-week baby 16 days prior to presentation. She was on aspirin as she had high risk of pre-eclampsia. She had presented with a 2-day history of worsening dull headache, and a generalised tonic-clonic seizure that lasted 2 minutes. There was no preceding fall, head injury, fever, localising infective symptoms, abdominal pain or vaginal discharge. Her vital signs were: Temperature 39.5°C, Blood pressure 166/104 mmHg, Heart rate 167 beat/minute, respiratory rate of 20 breaths/minute and oxygen saturation of 99% on room air. Her Glasgow coma score (GCS) was E1V1M3 and capillary blood glucose was 12 mmol/L. Her physical examination demonstrated a central gaze and bilateral 5mm pupils with sluggish reaction. There were no rashes or neck stiffness. She was given magnesium sulphate and labetalol for possible eclamptic seizure; and antibiotics for possible infection. Endotracheal intubation was performed due to low GCS. A non-contrasted CT brain showed a hematoma and hyperdense left transverse sinus. A CT venogram confirmed cerebral venous sinus thrombosis (CVST) of the left transverse and sigmoid sinuses. She had emergency left decompressive craniectomy, and is currently undergoing rehabilitation therapy.

Conclusion

Post-partum eclampsia can occur up to 6 weeks after delivery. CVST is caused by occlusion of the major cerebral venous sinuses and occurs more frequently in women during pregnancy and puerperium. CVST and postpartum eclampsia have similar manifestations and can be challenging to differentiate clinically. It is important to consider advanced neuroimaging to promptly diagnose CVST. Early therapeutic intervention of CVST can reduce further neurological deterioration and improve outcomes.

Keywords: cerebral venous sinus thrombosis; neurology

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ANALYSIS OF PRE-ANNOUNCED CRITICALLY ILL PATIENTS IN A TERTIARY EMERGENCY DEPARTMENT

***Paola Bajlo[1], Krešimir Rukavina[1], Laura Kustura[1], Matea Bingula[1], Mirna Alvir[1], Ivan Gornik[1]**

Abstract

Pre-notification of critically ill patients by prehospital emergency medical services is essential for timely mobilisation of the hospital team and optimal resource allocation. However, inaccurate estimation of severity or arrival time may lead to unnecessary activation of resources and workflow disruption in the emergency department (ED). Data on the structure and outcomes of pre-announced critically ill patients in the Croatian healthcare system remain limited. The aim of this study was to analyse the characteristics and outcomes of pre-announced critically ill patients and to assess organisational aspects of pre-notification in a tertiary-level centre.

Methods

A prospective analysis of data collected at University Hospital Centre Zagreb was conducted for the period from October 2025 to 31 January 2026. All pre-announced patients were included. Demographic data, reason for pre-notification, appropriateness of estimated time of arrival (ETA), ED management and final hospital outcomes were analysed.

Results

A total of 203 patients (58 % male) were included. The most common reasons for pre-notification were neurological conditions (28 %), cardiovascular conditions (21 %), and trauma (15 %). Following ED assessment, 74 % of patients were admitted to hospital, 20 % were discharged, and 6 % died in the ED. Overall in-hospital mortality was approximately 19 %. Clinical overtriage, defined as pre-notification without subsequent need for urgent or invasive interventions and resulting in discharge from the ED, was estimated in approximately 10–15 % of cases. Significant discrepancies between estimated and actual arrival times (>10 minutes) were observed in approximately 20–25 % of cases, leading to team mobilisation without immediate need for intervention.

Conclusion

Preliminary data suggest generally appropriate selection of patients and good correlation between pre-notification and clinical severity. Nevertheless, opportunities remain to improve the accuracy of pre-notification and arrival time estimates. Continuous evaluation of the pre-notification process may contribute to better resource utilisation, improved team coordination, and more efficient organisation of care in a tertiary-level ED.

Keywords: critically ill; emergency department; pre-notification

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APPLICATION OF SERUM BIOMARKERS IN ASSESSING MILD TRAUMATIC BRAIN INJURY IN CHILDREN

***Matea Bingula[1], Iva Miloš[2], Lea Miklić[1], Anja Martić[1], Ivana Lapić[1]**

Abstract

In pediatric emergency medicine, mild traumatic brain injury (mTBI) is common, but the challenge is avoiding unnecessary CT scans due to the risks of ionizing radiation. Serum biomarkers glial fibrillary acidic protein (GFAP) and ubiquitin C-terminal hydrolase L1 (UCH-L1) are already used in assessing mild TBI in adults, and this study aimed to investigate their promise as tools for risk stratification and prediction of intracranial lesions in children.

Methods

In this pediatric cohort, the mentioned biomarkers GFAP and UCH-L1 were applied as part of the management of mild TBI in our emergency department. We analyzed 17 patients under 18 years with mild TBI (GCS 13-15), with samples taken within 1-12 hours of injury according to protocol. Low values of GFAP (<50 ng/L) and UCH-L1 (<400 ng/L) were consistent with normal clinical status and low-risk injury mechanisms.

Results

In several cases, elevated GFAP and/or UCH-L1 were recorded with negative CT findings, while in high-energy trauma and complex fractures, significant increases in biomarker values were also noted, especially GFAP. These findings align with the literature; studies show high negative predictive value of GFAP for ruling out CT-positive lesions in children, with potential to reduce scans by 30-50 % at 98 % sensitivity. The BRAINI-2 protocol confirms the need for validation of these biomarkers in multicenter pediatric cohorts.

Conclusion

Results suggest that combining GFAP and UCH-L1 with good clinical criteria (e.g., Canadian CT Head Rule) enables safe triage of children with mTBI, contributing to decisions on CT necessity. Meanwhile, clearly elevated values combined with high-risk injury mechanisms and/or clinical deterioration can aid in selecting children for whom CT is indicated. These results support the role of GFAP and UCH-L1 as auxiliary tools in managing pediatric patients with mild traumatic brain injury in emergency services, with the need for further validation studies and definition of age-specific thresholds for children.

Keywords: biomarkers; children; mTBI

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ARE THERE LIMITATIONS TO THE USE OF KETAMINE DURING INTUBATION IN THE EMERGENCY DEPARTMENT: A TWO CASE REPORT

***Anika Stepić**[1]

Abstract

Ketamine is commonly used as an induction agent for tracheal intubation in the emergency department due to its favorable hemodynamic profile. It has a rapid onset, a short duration of action, and causes minimal respiratory depression. Ketamine is often preferred in patients with unstable hemodynamics because of its ability to increase blood pressure. However, in cases of refractory hypotension or depleted catecholamine reserves, it can paradoxically cause cardiovascular collapse.

Case report

Aim was to present two different clinical cases of ketamine use during emergency intubation, one in a patient with cardiogenic shock following thoracic aortic aneurysm rupture, and another in a patient with respiratory distress after aspiration, and to analyse its safety and efficacy in these critical settings. In the patient with cardiogenic shock, ketamine enabled successful intubation and adequate ventilation, with haemodynamic stabilisation achieved through prompt vasopressor support. In the second patient, presenting with acute respiratory insufficiency after aspiration, stable haemodynamics and effective ventilation were maintained throughout the procedure without complications.

Conclusion

A recent randomised trial, published in The New England Journal of Medicine (2025) reported that ketamine did not result in a lower 28 day inhospital mortality compared to etomidate. Cardiovascular collapse occurred in 22 % of patients who received ketamine, compared to 17 % with etomidate. These findings indicate that, while both agents are effective for rapid sequence intubation, ketamine may carry a slightly higher risk of postinduction circulatory instability in critically ill patients. The results correspond with our clinical experience: in the first case, despite severe hypotension, haemodynamic stability was maintained with early vasopressor support. To date, there are no definitive data supporting either ketamine or etomidate as the preferred agent for induction during emergency intubation of critically ill adults. Careful patient selection and individualised titration remain essential to ensuring safe and effective outcomes during emergency airway management.

Keywords: cardiogenic shock; emergency intubation; ketamine

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ATYPICAL ACUTE ABDOMEN IN AN ELDERLY PATIENT WITH RAPID PROGRESSION TO SEPSIS

***Barbara Miklečić[1], Nikolina Boršćak Tolić[1]**

Abstract

Acute abdomen in elderly patients often presents with atypical and nonspecific symptoms, which makes early recognition difficult. In this population, systemic inflammatory response and sepsis may develop rapidly and follow a progressive course, even when appropriate diagnostic and therapeutic measures are undertaken in a timely manner.

Case report

We present the case of an 82-year-old woman transported by emergency medical services to the emergency department due to several days of epigastric and right upper quadrant abdominal pain accompanied by vomiting of non-hematemetic gastric content. A prehospital ECG revealed newly detected atrial fibrillation with rapid ventricular response. According to her medical history, the patient had arterial hypertension, colonic diverticulosis, osteoporosis, rheumatoid arthritis, and hypothyroidism, and was receiving triple antihypertensive therapy, levothyroxine, methotrexate, and a proton pump inhibitor. On arrival, she was mildly hypertensive, mildly tachypneic at rest, afebrile, and tachycardic. Physical examination revealed a diffusely tender abdomen with a punctum maximum in the right upper quadrant and a positive Murphy's sign. Initial laboratory evaluation demonstrated marked leukocytosis, significantly elevated inflammatory markers, microcytic anemia, and acute kidney injury. Plain abdominal radiography was not performed due to poor patient cooperation. Focused abdominal ultrasound demonstrated free fluid with air bubbles between the liver and diaphragm and between the spleen and diaphragm. Abdominal MSCT revealed pneumoperitoneum with free intraperitoneal air and fluid; however, the exact site of perforation could not be determined due to diffuse air distribution. Emergency surgery confirmed a prepyloric perforation of the anterior gastric wall. Postoperative management was continued in the intensive care unit; however, the early postoperative course was complicated by sepsis and respiratory failure. Despite intensive treatment measures, the patient died.

Conclusion

The aim of this report is to highlight the diagnostic and management challenges of acute abdomen in elderly patients, which may present atypically and rapidly progress to sepsis.

Keywords: acute abdomen; atypical presentation; pneumoperitoneum

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AWAKENED BY HEADACHE: PREHOSPITAL RECOGNITION OF MENINGOCOCCAL MENINGITIS COMPLICATED BY VENTRICULITIS

***Marija Kostanjski[1], Dora Meštrović[1], Drinko Granić[1], Ana Anđelić[1], Maja Grubeša[1]**

Abstract

Acute headache accompanied by fever and altered mental status represents a high-risk presentation in emergency medicine requiring rapid recognition of potentially life-threatening central nervous system infections. Early identification of bacterial meningitis in the prehospital setting remains crucial for timely initiation of antimicrobial therapy and prevention of severe neurological complications. The aim of this case report is to emphasize the importance of early emergency medical services (EMS) recognition of meningitis and awareness of possible intracranial complications despite appropriate initial treatment.

Case report

A 38-year-old male was transported by EMS due to high fever (39.5 °C), generalized weakness, repeated vomiting, and severe occipital headache that awakened him from sleep. On prehospital assessment, the patient was somnolent, photophobic, markedly agitated, with pronounced neck stiffness and a positive Kernig sign, prompting suspicion of acute meningitis. On emergency department arrival, he was hemodynamically stable with a Glasgow Coma Scale score of 13 but remained severely agitated. Empirical intravenous ceftriaxone therapy was administered immediately. Initial computed tomography (CT) demonstrated diffuse cerebral edema without focal pathology. Cerebrospinal fluid analysis revealed purulent meningitis, and microbiological testing confirmed infection with Neisseria meningitidis. The patient required intensive care management for meningococcal meningitis complicated by sepsis. Although cerebrospinal fluid sterilization was achieved after three days of therapy, follow-up magnetic resonance imaging (MRI) performed on day nine demonstrated purulent intraventricular content within the left lateral ventricle consistent with ventriculitis. Continued antimicrobial and supportive treatment resulted in progressive neurological recovery.

Conclusion

This case highlights the critical role of EMS in recognizing high-risk presentations such as headache accompanied by fever suggestive of meningitis. Early prehospital suspicion enabled prompt antimicrobial therapy and early emergency management. Lack of expected clinical improvement in bacterial meningitis should prompt evaluation for complications such as ventriculitis, which may significantly influence patient outcome.

Keywords: cerebral ventriculitis; fever; headache; meningitis

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BACK PAIN AND THE NEEDLE: ARE WE RUNNING AN EMERGENCY DEPARTMENT OR AN INJECTION BAR?

***Andrija Babić[1], Leo Luetić[1], Ivan Lovrinčević[2]**

Abstract

Low back pain remains one of the most common reasons for presentation to emergency departments (EDs) across Europe, despite clear guideline recommendations that emphasize conservative, primarily oral and non-pharmacological management. This study explores the burden of back pain presentations and treatment patterns in a small emergency medicine setting, questioning whether current practice aligns with evidence-based recommendations or with the true mission of emergency care.

Methods

We have conducted a retrospective analysis of all patients presented at the outside of hospital ED in Vrgorac in one year period between 1st January and 31st December 2025.

Results

During this period, a total of 3,236 patients were treated: 546 through field interventions and 2,690 in the ED in Vrgorac. Musculoskeletal diagnoses (ICD-10 M00-M99) accounted for 353 cases, of which 229 patients were diagnosed specifically with different type of dorsalgia (M54-M54.9). Treatment patterns revealed a strong preference for parenteral therapy. Among patients with dorsalgia, 165 received intramuscular diclofenac, 15 intramuscular ketoprofen, and 36 intramuscular tramadol. Metamizole was administered intravenously in four cases. Only six patients received paracetamol per os or intravenously in combination with an NSAID. In addition, 186 patients were treated with intramuscular dexamethasone and 126 with intramuscular diazepam.

Conclusion

These findings highlight a striking discrepancy between guideline recommendations and real-world emergency practice. European guidelines consistently advise against routine parenteral therapy, corticosteroids, and benzodiazepines for non-specific low back pain, favoring oral analgesics and early mobilization. Yet, in everyday emergency medical care, injections remain the default-perhaps driven by patient expectations, time pressure, or the enduring myth that "a shot works better." Is the role of emergency medicine to manage uncomplicated low back pain, often contrary to guidelines, or should the ED refocus on true emergencies? Data suggest that redefining both patient expectations and clinician habits may be as important as any new guideline- preferably without another injection.

Keywords: dorsalgia; education; guidelines; injection; myths

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BEWARE OF EDKA IN METABOLIC ACIDOSIS – A CASE REPORT

***Tea Fabijanić[1], Bojana Radulović[1], Ivan Gornik[1]**

Abstract

Euglycemic ketoacidosis (eKA) is a severe metabolic disorder characterised by acidosis, high ketone bodies serum concentrations and relative euglycemia (glucose blood levels ≤11), with nausea, vomiting, tachypnoea, tachycardia, altered consciousness. It is rare, potentially life-threatening condition, emerging now with the widespread use of Sodium-Glucose Cotransporter 2 inhibitors (SGLT-2) either as a diabetes or heart failure modulating drug, as it can be its side-effect. To raise awareness to this rare pathology we present following case.

Case report

A 63-year old female patient with diabetes presented to the emergency department with high fever lasting for 2 days. Upon arrival she was tachycardic (heart rate 119/min) and tachypnoeic (respiratory rate 24/min) with tympanic temperature 36,7 C°, initially normotensive (120/56 mmHg) but quickly became disoriented with worsening of the initial symptoms and the development of septic shock. The initial blood analysis confirmed severe eKA: pH 6.89, lactate 2.2, HCO3 1.9, BE -31.2, glucose blood levels 7.6, ketones 5.1, and urinary tract infection: pathological urine sample, CRP 190 mg/L, L 10.7. She was subsequently hospitalised in the intensive care unit (ICU). Treatment consisted of continuous infusion of 5% glucose solution with iv. insulin, rounds of bicarbonates, intravenous antibiotics and crystalloid infusions to replenish the volume. Patient was stabilised without a need for vasopressors and after resolving infection and balancing metabolic equilibrium discharged home with recommendation to permanently discontinue SGLT-2 inhibitors.

Conclusion

Euglycemic ketoacidosis is a potentially life-threatening metabolic disorder caused by an infection, starvation, alcohol abuse; recently mostly by medication. eDKA is a common subtype of this disorder that can be easily overlooked. We present this case to act as a beacon and a reminder to keep an eye on euglycemic ketoacidosis, its signs and symptoms, since it is uncommon and unexpected in diabetes patients, and can be treated effectively - treatment is the same as that of diabetic ketoacidosis.

Keywords: euglycemic ketoacidosis; acidosis; sepsis; SGLT-2

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BEYOND SCREENING: DIASTOLIC SHOCK INDEX AS A FAILURE-TO-NORMALIZE MARKER FOR EARLY CRITICAL CARE ESCALATION

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Abstract

The diastolic shock index (DSI), calculated as heart rate divided by diastolic BP, has emerging utility as a marker of vasodilatory shock and progression to septic shock in the emergency department (ED). Pre-hospital shock index thresholds are already recognised as high-risk in other contexts, yet the role of DSI as a dynamic marker across the ED–intensive care (ITU) pathway remains unclear. This audit aimed to examine the behaviour of pre-hospital and early ED DSI in infection-related presentations requiring ITU admission, to assess whether persistent elevation of DSI despite resuscitation may represent a failure-to-normalise signal warranting earlier critical care involvement.

Methods

We conducted a retrospective audit of adult patients (≥18 years) referred from the ED directly to ITU with an infectious cause over a 12-month period (n = 144). Pre-hospital and ED physiological data were reviewed, including highest DSI pre-hospital and within the first hour of ED arrival, patients on rate-control medications, vasopressor initiation in the ED, and time to ITU referral. Fluid volume was not analysed due to inconsistent documentation in high-acuity cases in real-time; instead vasopressor use was used. Statistical analysis was performed.

Results

Despite a reduction in DSI following ED resuscitation, 69.4% patients admitted to ITU had an ED DSI ≥ 1.5 within the first hour, and 23.6% remained ≥ 2.0, indicating persistent haemodynamic abnormality. 1/4 of patients were receiving rate-limiting or anti-arrhythmic medication, yet elevated DSI remained common, suggesting the signal reflects physiological stress rather than tachycardia alone. Median time to ITU referral was 198 minutes, despite early physiological warning signs being frequently present.

Conclusion

DSI ≥ 1.5 should not be viewed solely as a screening threshold, but as a failure-to-normalise marker. Pre-hospital DSI identifies risk at first contact, while persistent ED DSI elevation may help prompt earlier critical care discussion in patients with advanced infection.

Keywords: disatolic shock index; sepsis

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BEYOND TRIAGE CATEGORY: A CASE OF ATYPICAL MYOCARDIAL INFARCTION AND INTESTINAL ISCHEMIA

***Lara Žubrinić[1], Martina Pavletić[2], Klara Poldan Skorup[2]**

Abstract

Emergency department triage systems are designed to rapidly prioritize patients based on urgency, primarily using presenting complaints and vital signs. These tools are essential for ensuring patient safety and flow. However, they cannot fully account for atypical presentations or subtle clinical findings.

Case report

A 79-year-old female patient presented to the emergency department with a three-week history of generalized weakness, diarrhea, vomiting, and flatulence. She denied chest pain, dyspnea, or palpitations and reported no chronic illnesses or medication use. At triage, she appeared weakened yet hemodynamically stable and was assigned Australasian triage scale category 4 (ATS 4). Physical examination revealed lower abdominal tenderness without peritoneal signs, while cardiopulmonary findings were unremarkable. An electrocardiogram, performed because of generalized weakness showed ST-segment elevation with pathological Q waves in the inferior leads. Laboratory findings included elevated troponin I (7.302 ng/L, cut off value 17.5) and NT-proBNP (15.629 ng/L, cut off value 450). Computed tomography excluded mesenteric arterial thrombosis but revealed right renal infarction and atrophy. The patient was admitted to cardiology department for further management. Unfortunately, the subsequent course was complicated by recurrent ventricular tachycardia and progressive, ultimately irreversible circulatory collapse despite maximal therapy.

Conclusion

In emergency practice, nonspecific symptoms such as fatigue or gastrointestinal disturbances are frequently and are often benign. However, this case illustrates that exclusive reliance on triage categories may underestimate serious underlying pathology. Triage should serve as a supportive guide, not a definitive indicator. Continuous clinical reassessment and inclusion of clinical judgment remain essential for patient safety.

Keywords: intestinal ischemia; myocardial infarction; triage

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BLOOD PRODUCT ADMINISTRATION IN THE EMERGENCY DEPARTMENT OF UNIVERSITY HOSPITAL SVETI DUH – A THREE-YEAR EXPERIENCE AND THE ROLE OF NURSING STAFF

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Abstract

The emergency department (ED) of University Hospital Sveti Duh has recorded a continuous increase in blood product administration, primarily packed red blood cells (PRBCs). This study aims to present the three-year trend in blood product use and highlight the nurse's role in monitoring and safe handling of blood products.

Methods

Data on blood product administration in the ED were retrospectively analysed for the period 2023–2025. The number of units, patients, age distribution, etiology, outcomes, and complications were recorded.

Results

A marked upward trend in PRBC administration was observed, with 660 units administered to 390 patients in 2023.905 units to 457 patients in 2024, and 1.112 units to 642 patients in 2025. Most indications were non-traumatic, predominantly symptomatic anaemia referred by general practitioners, less frequently self-referrals, and to a lesser extent massive haemorrhage. Age distribution showed approximately 30 % of patients were under 40 years, 30 % aged 40–50, 16 % aged 50–60, 21 % aged 60–70, and 5 % over 70 years. Acute bleeding was present in 25 % of cases (70 % gastrointestinal), while chronic anaemia accounted for 40 %. Median pre-transfusion haemoglobin was 68 g/L. The second most commonly used product was prothrombin complex concentrate (PCC), followed by platelets, while plasma was administered only sporadically over the last two years during hospitalisation. Most patients were discharged after anaemia correction with recommendations for outpatient follow-up. Transfusion guidelines were followed in nearly all cases. No transfusion complications were recorded.

Conclusion

The rising trend in blood product use necessitates organisational adaptation. The zero complication rate confirms the quality of nursing care and adherence to transfusion guidelines. We advocate for introducing a dedicated transfusion link nurse role and incorporating formal transfusion education into annual training programs.

Keywords: blood transfusion; safety

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BOERHAAVE SYNDROME PRESENTING AS ACUTE-LEFT SIDED ABDOMINAL PAIN: A DIAGNOSTIC CHALLENGE

***Teodora Pilat[1], Klara Poldan Skorup[2], Martina Pavletić[2]**

Abstract

Boerhaave syndrome, a spontaneous esophageal rupture typically following forceful emesis, represents a life-threatening condition often masked by non-specific or atypical symptoms. Early recognition is crucial, as diagnostic delay significantly increases morbidity and mortality. This case shows diagnostic challenges when classical features are absent, and abdominal pain dominates the clinical picture.

Case report

A 41-year-old male presented to the emergency department (ED) with acute abdominal pain localized to the left hemiabdomen. The pain began approximately two hours after a meal, progressively intensified, and was aggravated by deep inspiration. Prior to arriving to the ED, the patient reported a fast car ride over potholes resulting in repeated jolting while seated in the passenger seat. He denied nausea, vomiting, chest pain, or dyspnea. On admission, he was in good general condition, hemodynamically stable, and had normal vital signs. Auscultation of the chest revealed no abnormalities, while abdominal examination demonstrated diffuse tenderness with a tense abdominal wall. Initial laboratory findings were non-specific. Despite analgesic therapy, the pain persisted without significant relief. Ultrasound examination, alongside chest and abdominal radiographs showed no pathological findings. Given the persistence and progression of symptoms, abdominal computed tomography (CT) revealed air inclusions immediately above the gastric cardia. Subsequent contrast-enhanced CT confirmed a distal esophageal perforation, consistent with Boerhaave syndrome. The patient was urgently transferred to the surgery department for emergency operative management.

Conclusion

This case highlights the significant diagnostic challenge associated with Boerhaave syndrome, particularly in the absence of typical symptoms such as intense, sudden chest pain, vomiting, and tachypnea. The lack of characteristic clinical features may lead to potential delays in recognition, especially when the initial presentation mimics more common abdominal conditions. This case further emphasizes the need for a broad differential diagnosis and the role of advanced imaging in establishing an early diagnosis and improving patient outcomes.

Keywords: Boerhaave syndrome; esophagus; perforation

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CAN COPEPTIN WITH HIGH-SENSITIVITY TROPONIN T AID IN THE EARLY RULE-OUT OF ACUTE MYOCARDIAL INFARCTION IN THE EMERGENCY DEPARTMENT?

***Sofia Bezati[1], Christos Verras[1], Louiza Mpoumi[1], Georgia Sarantou[1], Dionysis Matsiras[1], Estela Kiouri[1], Lambros Markos[1], Vasiliki Bistola[1], Ioannis Ventoulis[2], Effie Polyzogopoulou[1], John Parissis[1]**

Abstract

Copeptin, a marker of endogenous stress, has been used for the early detection of patients with Acute Myocardial Infraction presenting to the emergency department (ED) with chest pain in combination with cardiac troponin, a marker of myocardial injury. Although its diagnostic value in conjunction with conventional troponin is well established, its additive value combined with high-sensitive troponin is not well defined. Aim: To evaluate the diagnostic value of a dual marker strategy (DMS) consisting of copeptin in combination with high sensitive troponin T (hs-cTnT) measured upon ED presentation as compared with the recommended by the European Society of Cardiology (ESC) algorithms of hs-cTnT 0/1h and 0/2h for ruling-out Non-ST elevation Myocardial Infraction (NSTEMI).

Methods

In a double-blind prospective observational study (IRB347/02/07/2021), from September 2021 to October 2023, we enrolled 102 patients presenting to the ED because of chest pain of <6hours duration; patients with STEMI were excluded. In the total population (N=102), copeptin and hs-cTnT were measured upon patient presentation (time 0, DMS). Hs-cTnT was re-measured either on 1 hour (N=51) or 2 hours (N=51) after time 0. NSTEMI diagnosis was confirmed according to ESC guidelines. We compared the sensitivity, specificity, negative (NPV) and positive predictive value (PPV) of the DMS (using cut-offs for copeptin<10pmol/L and hs-cTnT<14ng/L) against the hs-TnT algorithms 0/1h and 0/2h for ruling-out NSTEMI.

Results

59.8% of the population were men, with a mean age of 76±18 years. 8.8 % of patients were diagnosed with NSTEMI. The DMS demonstrated sensitivity 88.9 % (95% CI: 51.75–99.72) and negative predictive value (NPV) 98.4 % (90.92–99.76), while the hs-cTnT 0/1h algorithm showed sensitivity 60% (14.66–94.73) and NPV 95.6 % (88.06–98.45) and the hs-cTnT 0/2h algorithm had sensitivity 75 % (19.41–99.37) and NPV 95.8 % (85.22–98.93).

Conclusion

The dual marker strategy has a comparable diagnostic accuracy to the ESC hs-cTnT 0/1h and 0/2h algorithms for the early rule-out of NSTEMI patients.

Keywords: acute myocardial infarction; copeptin

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CAN MASSIVE PE PRESENT WITH BRADYCARDIA AND NORMAL SATURATION?

***Janice Soo Jie Er[1], Wee Yee Lee[2], Pak Liang Goh[2], Guek Gwee Sim[2], Bao Yu, Geraldine Leong[2]**

Abstract

Pulmonary embolism (PE) carries high mortality. High-risk features include hypotension, tachycardia, and desaturation due to right ventricular dysfunction and obstructive shock.

Case report

An 80-year-old ambulant and independent woman presented to the resuscitation area with an abnormal ECG. She had a abstract history of hypertension, hyperlipidemia, and osteoporosis. The history revealed acute-onset severe epigastric pain without chest pain or gastrointestinal symptoms. Vital signs were as follows: temperature 37.6°C, respiratory rate 23 breaths per minute, blood pressure 91/67 mmHg, heart rate 55 bpm, and SpO2 98% on room air. Examination showed significant distress from pain, clear lung auscultation, and a mildly tender epigastrium. Initial ECG demonstrated atrioventricular (AV) dissociation with mild ST elevation in lead III. Bedside ultrasound revealed reduced right ventricular (RV) contractility with preserved left ventricular (LV) contractility and no D-shaped LV. ECG showed bradycardia with AV dissociation and T-wave inversions in anterior and inferior leads. Biochemical investigations were significant for elevated troponin (197 ng/L) and lactate (12 mmol/L). CT mesenteric angiogram was negative, but further review of the images revealed a saddle pulmonary embolism. The patient subsequently underwent pulmonary embolectomy.

Conclusion

This patient exhibited a specific ECG finding consistent with the Kosuge phenomenon, characterized by T-wave inversions in anterior and inferior leads. However, atypical features included epigastric pain, normal saturation, and bradycardia instead of tachycardia. Possible mechanisms of bradycardia in PE include reflex vagal stimulation or involvement of the conduction system. These are usually observed in patients with underlying cardiac conduction disorders or in cases of massive PE with syncope.

Keywords: bradycardia; pulmonary embolism

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CARDIOPULMONARY RESUSCITATION OF A DROWNING VICTIM WITH SEVERE HYPOTHERMIA: A CASE REPORT

***Barbara Kauzlarić[1], Jakov Jurić[1], Branka Bardak[1], Krešimir Šofić[1]**

Abstract

Drowning is defined as a process of experiencing respiratory impairment due to submersion or immersion in liquid. It is frequently associated with accidental hypothermia. The aim of this case report is to emphasize the importance of hypothermia in drowned patients presenting with cardiac arrest.

Case report

The medical dispatch unit received a call from police who found an unidentified young adult woman in the Sava river. The patient was the last recovered victim after a migrant boat capsized in the early morning hours. The estimated submersion time exceeded 120 minutes. On emergency medical service (EMS) arrival, the patient was unresponsive, apneic, and pulseless, with absent central and peripheral pulses. Severe accidental hypothermia (core temperature <30°C) was presumed due to winter conditions and prolonged exposure to cold water. Cardiopulmonary resuscitation (CPR) was initiated according to European Resuscitation Council (ERC) Guidelines 2025 for drowning and hypothermic cardiac arrest. The initial rhythm was ventricular fibrillation, which alternated with ventricular tachycardia, pulseless electrical activity, and asystole. The airway was initially secured with supraglottic airway device and subsequently with endotracheal tube. Attempts to measure core body temperature using a digital thermometer were unsuccessful. Active rewarming methods included warmed intavenous crystalloids and thermal blankets. Three defibrillation attempts were delivered. Since core themperature was unknown, medicine administration and additional defibrillations were delayed. After a prolonged rewarming period, the patient appeared warmer on chest palpation, and procedures were continued in accordance with ERC hypothermia protocols. CPR continued during transport to hospital. Despite continued resuscitative efforts, the patient died several hours later.

Conclusion

Although prolonged submersion time in cold water is a significant negative prognostic factor, it should not alone impact on withholding or delaying CPR. Hypothermia may both precipitate cardiac arrest and provide neuroprotection. Future efforts should focus on improving prehospital core temperature assessment and strengthening evidence-based criteria to enhance survival.

Keywords: cardiac arrest; CPR; drowning; hypothermia

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CASE REPORT OF ACONITE POISONING

***Szemein Gan[1], Elizabeth Tan Ming Jing[1], Rupeng Mong[2]**

Abstract

Aconite (Aconitum spp.) is a cardiotoxic plant still used in traditional Chinese medicine for analgesia. We report accidental aconite overdose causing haemodynamic instability and multifocal arrhythmias after ingestion of a self-prepared herbal broth.

Case report

A 40-year-old man presented to the emergency department with vomiting and diarrhoea. On arrival: temperature 36.1°C, HR 110 bpm, BP 76/46 mmHg, RR 19/min, SpO_2 99 % on room air. He was alert with strong peripheral pulses and no focal neurological deficits. Symptoms of limb numbness, abdominal cramps, vomiting, diarrhoea and syncope began shortly after consuming ~200 mL of self-prepared aconite root ("PaoFuZi") broth for gout flare. Telemetry showed accelerated junctional rhythm with runs of non-sustained atrial tachycardia. ECG demonstrated accelerated junctional rhythm with multifocal premature ventricular complexes and premature atrial complexes; QTc was 570 ms. Point-of-care testing showed pH 7.381, bicarbonate 21 mmol/L, lactate 5.2 mmol/L. As no antidote exists, treatment was supportive. After toxicology consultation, he received 1.5 L IV crystalloid and IV magnesium sulphate. Lactate improved to 4.3 mmol/L with BP 109/68 mmHg and HR 74 bpm without vasopressors. Rhythm intermittently alternated between accelerated junctional rhythm and sinus rhythm. IV amiodarone was considered but withheld due to clinical improvement and absence of sustained ventricular tachyarrhythmia. He was admitted to high dependency for monitoring. Troponin-T rose from 61 to 660 ng/L over 12 hours. He remained largely in sinus rhythm with symptom resolution approximately 11 hours post ingestion, but requested discharge against medical advice the same day due to financial reasons; lactate prior to discharge was 1.9 mmol/L.

Conclusion

Aconite poisoning is managed supportively, with fatal ventricular arrhythmias typically occurring within 24 hours. This case highlights the need for clinician awareness of traditional medicine use and public education on related harms.

Keywords: aconite; toxicology

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CHALLENGES IN EMERGENCY MEDICINE IN CARING FOR GERIATRIC PATIENTS

***Bruno Sen[1], Zdeslav Strika[1], Nikolina Pozega[1]**

Abstract

Geriatric medicine is a medical specialty focused on the comprehensive health care of older adults, addressing complex, chronic, and multiple conditions to maximize independence and enhance quality of life, often including palliative care. The population of the Republic of Croatia continues to age. According to data from the Croatian Central Bureau of Statistics, the average share of the population in 2021 aged 65 and over was 22.35%, and 5.53% were over 80 years old. Life expectancy at birth was 73.8 years for males and 80 years for females. Aging is a complex and multifactorial process characterized by many structural and functional changes and is also defined as a normal, progressive decline in the function of every major organ system in the human body. Managing geriatric patients represents a significant challenge in emergency medicine because symptoms and clinical signs are often atypical or appear earlier or later than in younger adult patients. Nowadays, older adults increasingly require transport by emergency medical services due to global population aging. Many conditions in the geriatric population are not recognized in time because of a lack of education in geriatric medicine, as they represent a sensitive group of patients.

Conclusion

The care of older patients in the emergency department (ED) is often complex due to comorbidities, polypharmacy, and cognitive and functional decline. Furthermore, older patients are frequent visitors who often present with atypical symptoms, require more extensive diagnostic workups, and stay longer in the ED. Improved education of prehospital care providers is necessary to enhance early recognition and treatment of geriatric-specific conditions. In addition, an interprofessional emergency team and an area dedicated to older patients can also lead to a lower hospital admission rate.

Keywords: comorbidity; emergency; geriatrics

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CLINICAL APPLICATION OF BLOOD BIOMARKERS IN SUSPECTED LOW-RISK TRAUMATIC BRAIN INJURY

***Iva Miloš[1], Anja Marić[1], Ivana Lapić[2], Matea Bingula[2], Lea Miklić[2]**

Abstract

Mild traumatic brain injury (mTBI) is defined according to the Glasgow Coma Scale score of 13–15, with normal or transiently altered neurological findings and no major structural damage on initial imaging. A dual-marker panel consisting of GFAP and UCH-L1 has emerged as an aid to clinical decision-making, with the potential to reduce CT utilization in patients with suspected low-risk trauma brain injury.

Methods

This retrospective study included adult patients evaluated for suspected traumatic brain injury at the emergency department of the University Hospital Centre Zagreb between January 2025 and January 2026, a Glasgow Coma Score ≥13, and blood sampling for GFAP/UCH-L1 within 24 hours of injury. Biomarker sampling was performed by physicians in the emergency department, based on their individual clinical judgment and understanding of biomarker utility. The Canadian CT Head Rule score was calculated for all patients. Clinical data were retrieved from the hospital database.

Results

Of 184 patients assessed, 164 met inclusion criteria. Among 107 patients with biomarker levels within the reference range, 26 (24.3 %) underwent CT, revealing pathological findings in 4 (15.4 %) — one subarachnoid hemorrhage and three skull fractures. In the elevated biomarker group (n=57), 53 (93.0 %) underwent CT, with pathological findings in 14 (26.4 %), including four cases of post-traumatic intracranial hemorrhage. The Canadian Head CT score was ≥1 in 140 patients (85.4 %), indicating a CT recommendation.

Conclusion

Multi-marker approaches, particularly the dual-marker panel of GFAP and UCH-L1, when applied in the appropriate clinical context, may further enhance diagnostic sensitivity and specificity, and contribute to a meaningful reduction in unnecessary radiation exposure without compromising patient safety.

Keywords: biomarkers; brain; mild traumatic injury

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CLOSING THE THERAPEUTIC VACUUM: IMPACT OF TACTICAL EMERGENCY MEDICAL SERVICES (TEMS) IN CIVILIAN MASS CASUALTY INCIDENTS

***Alan Kvarantan[1]**

Abstract

Mass casualty incidents (MCIs), such as terrorist attacks and active shooter events, pose unique challenges to prehospital care. Traditional safety protocols often create a "therapeutic vacuum," delaying medical access to victims while police secure the scene, thereby increasing preventable deaths from exsanguination. This presentation explores the integration of Tactical Emergency Medical Services (TEMS) and Tactical Emergency Casualty Care (TECC) to bridge this gap. The TEMS model deploys specially trained medical providers into "warm zones" (areas of indirect threat) alongside law enforcement. This approach prioritizes immediate threat mitigation and life-saving interventions—specifically hemorrhage control and rapid extraction -over definitive treatment.

Conclusion

TEMS is becoming a critical operational sub-specialty that shifts the paradigm from "stage-and-wait" to integrated, forward-deployed care. To optimize survival, EMS systems must adopt standardized TECC guidelines, enhance interagency communication with police, and utilize simplified triage protocols suited for high-threat environments.

Keywords: tactical triage; TECC; TEMS

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COMPARISON OF CROATIAN ACUTE PAIN MANAGEMENT GUIDELINES BY CROATIAN SOCIETY FOR PAIN MANAGEMENT WITH GUIDELINES FOR ACUTE PAIN MANAGEMENT IN EMERGENCY SITUATIONS BY EUROPEAN SOCIETY FOR EMERGENCY MEDICINE

***Krešimir Šofić**[1]

Abstract

Acute pain is one of the most common reasons patients seek medical attention, especially in emergency settings. It is defined as pain of sudden onset and limited duration, often resulting from injuries, surgical procedures, or exacerbations of chronic conditions. Effective management of acute pain is essential not only for patient comfort but also for preventing complications such as chronic pain, psychological distress, and functional impairment. National and international guidelines provide evidence-based recommendations to standardize pain management. In Croatia, the Croatian Society for Pain Management (cro. Hrvatsko drustvo za lijecenje boli, HDLB) issues guidelines focusing on pain assessment, pharmacological and non-pharmacological interventions, and individualized care for special populations, including children, older adults, and patients with comorbidities. At the European level, the European Society for Emergency Medicine (EUSEM) offers guidelines for acute pain in emergency care, emphasizing structured assessment, treatment algorithms, and flexible pharmacotherapy tailored to different clinical scenarios. This study compares HDLB and EUSEM guidelines in terms of content and methodological quality. The AGREE II instrument was used to assess domains such as scope and purpose, stakeholder involvement, rigor of development, clarity of presentation, applicability, and editorial independence. This combined approach allows identification of similarities and differences in recommendations, as well as strengths and limitations of guideline development.

Conclusion

This comparison shows that both guidelines provide clear and clinically relevant recommendations. HDLB guidelines emphasize practical applicability and tailored treatment for specific populations, while EUSEM guidelines demonstrate greater methodological rigor and flexibility in emergency care contexts. Integrating EUSEM's methodological approaches into HDLB guidelines could enhance transparency, consistency, and implementation. Overall, aligning national guidelines with international standards supports high-quality, evidence-based acute pain management and provides a foundation for continuous improvement in patient care in Croatia.

Keywords: Croatian Society for Pain Management; EUSEM; guidelines; pain

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CONTRAST-INDUCED NEPHROPATHY: MYTH, REALITY, OR OUTDATED CONCEPT?

***Martina Pavletić**[1,2]

Abstract

Contrast-induced nephropathy (CIN), first reported by Alwall et al. in 1955, is defined as an increase in serum creatinin by ≥44 μmol/L or ≥25% from baseline within 48-72 hours following intravascular administration of contrast media (CM), provided no other cause of kidney injury is identified. The proposed mechanism involves a combination of renal vasoconstriction leading to reduced cortical and medullary perfusion, direct cytotoxic effects of CM on renal tubular cells, and increased oxidative stress resulting in medullary hypoxia. CIN has long been considered one of the most frequent cause of hospital-acquired acute kidney injury (AKI). However, recent evidence suggests that its true incidence has been overestimated, as many cases of post-contrast AKI are mutifactorial and not necessarily caused by CM itself. The overall incidence in the general population is low (1-2 %), but may exceed 40 % in high-risk groups such as patients with diabetes mellitus, pre-existing chronic kidney disease, heart failure, advanced age or dehydration. Due to improved awareness, refined risk stratification, the use of low- or iso-osmolar contrast agents, and evidence-based preventive strategies, the incidence of CIN has markedly declined in recent years. The cornestone of management is prevention - primarily through adequate intravenous hydration to maintain urine output and minimize intrarenal CM concentration, and careful patient selection. There is no specific therapy; management is supportive and only rarely requires renal replacament therapy in severe AKI. Although CIN is mainly a self-limiting disease, it is associated with increased morbidity, prolonged hospitalization, and higher mortality among vulnerable patients.

Conclusion

Given the growing debate and emerging data questioning the causal role of contrast in renal injury, the very concept of contrast-induced" nephropathy is increasingly challenged, reinforcing the need to adopt the term contrast-associated AKI (CA-AKI) and to re-evaluate traditional diagnostic criteria in cinical practice.

Keywords: acute kidney injury; contrast-induced nephropathy

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CRASHING PREGNANT PATIENT

***Lea Miklić**[1]

Abstract

The ABCDE framework remains applicable to pregnant patients, but resuscitation must be tailored to pregnancy-specific physiology: altered preload/afterload, airway edema, and reduced functional residual capacity, and altered drug pharmacokinetics. The European Resuscitation Guidelines (ERC), 2025, have issued recommendations regarding the management of pregnant patients. Obstetric-specific early warning signs could help identify critically ill pregnant patients and trigger multidisciplinary activation. When evaluating cardiac arrest causes, the mnemonic 4H and 4T should be augmented with the pregnancy-relevant 4P (preeclampsia/eclampsia, puerperal sepsis, placental/uterine issues, peripartum cardiomyopathy). The gravid uterus beyond the 20th week can compress the inferior vena cava and thus decrease venous return and preload, so relief of aortocaval compression is essential as early as possible and maintained throughout resuscitation. Manual left uterine displacement in maternal cardiac arrest is suggested due to practicality . Definitive relief of aortocaval compression may be achieved only by resuscitative hysterotomy (perimortem cesarean delivery, PMCD). Traditionally, the PMCD was recommended to take place within 5 minutes of cardiac arrest. According to the recent recommendation, the timing for resuscitative hysterotomy has shifted toward immediate preparation and initiation in the resuscitation room. Out-of-hospital arrest should favor rapid transport to a facility with obstetric/surgical capability, utilizing mechanical chest compression adjuncts, with a pre-alert to the receiving hospital so that a multidisciplinary team (emergency physician, anesthesia, obstetrician /surgeon, neonatology, perfusionist) can be assembled as soon as possible. Maternal extracorporeal membrane oxygenation (ECMO) is an option in eligible cases when resources and expertise are available.

Conclusion

Managing a crashing pregnant patient requires a coordinated, multidisciplinary approach that harmonizes obstetric-specific physiology with general resuscitation knowledge. The focus should be on early recognition and the prompt commencement of resuscitation efforts according to the physiological particularities of pregnant patients. Prompt efforts toward stabilizing the mother will stabilize the fetus.

Keywords: guidelines; obstetric physiology; obstetric resuscitation

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DEATH DETERMINED DURING EMERGENCY INTERVENTION AND TRANSPORT: A MANAGEMENT ALGORITHM

***Ana Maria Antić[1], Valter Stemberga[1], Martina Pereza Guščić[1], Silvia Arbanas[1], Dražen Cuculić[1]**

Abstract

Death determined during out-of-hospital emergency medical service (EMS) intervention or during patient transport represents an operational, organizational, and medico-legal challenge. Daily practice is characterized by inconsistent procedures regarding the location of death determination, jurisdiction over subsequent actions, communication between EMS teams, hospital institutions, medical examiners, and law enforcement, as well as responsibility for body transfer. These inconsistencies may result in delays in case management, administrative conflicts, variable documentation quality, and difficulties in forensic evaluation. The aim of this study was to identify key points of procedural inconsistency in cases where death is determined during emergency medical service intervention or patient transport, to assess the impact of these inconsistencies on legal certainty and forensic outcomes, and to propose a standardized management algorithm applicable to routine EMS practice and hospital emergency admission settings.

Methods

The study was designed as a retrospective analysis of archival cases from the Department of Forensic Medicine and Criminalistics in Rijeka involving individuals who died during EMS intervention or transport and underwent either an external post-mortem examination without autopsy or a forensic autopsy.

Results

The analysis focused on critical procedural points, including inconsistent recording of the time and place of death determination, differing interpretations of institutional jurisdiction, delayed activation of relevant stakeholders (medical examiner/police), variability in medical documentation content, and unclear protocols for body handover. Based on these findings, an updated decision-making algorithm is proposed for three key scenarios: death at the intervention site, death in an EMS vehicle, and death during interhospital transport.

Conclusion

A standardized management algorithm, supported by analysis of real-world forensic cases, may reduce procedural heterogeneity, facilitate real-time decision-making, and improve medico-legal security for all involved stakeholders. The implementation of a unified and clearly defined communication protocol represents a feasible and highly applicable step toward improving system-level management of deaths occurring during emergency intervention and transport.

Keywords: algorithm; EMS; forensics; mortality; transport

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DIAGNOSTIC AND THERAPEUTIC PROCEDURES IN THE MANAGEMENT OF EPILEPTIC SEIZURE AND EPILEPTIC STATUS IN THE EMERGENCY DEPARTMENT

***Darinka Tunjić Pejak[1], Josip Lipovac[1], Ivana Srzić[1]**

Abstract

This work aims to provide an overview of knowledge on seizure types, emergency diagnostic methods, acute management principles, and treatment, with emphasis on therapeutic algorithms for status epilepticus.

Epileptic seizures clinically manifest as spontaneous, unpredictable, and excessive electrical discharges of neurons. These seizures are repeated and unprovoked, resulting from impaired synchronization and transmission of electrical impulses between neurons. The clinical presentation of seizures is extremely heterogeneous, ranging from short-term disturbances of consciousness to pronounced generalized convulsions. This variation emphasizes the complexity of diagnosis and treatment. Status epilepticus presents a special clinical and therapeutic challenge. It is one of the most urgent conditions in neurology and is defined as a prolonged seizure or a series of seizures without recovery of consciousness between episodes. Treatment that is delayed or not started can lead to a high risk of permanent brain damage, systemic complications, and death. Management must begin as early as possible, ideally in outpatient settings, along with stabilization of vital functions. Therapy follows clearly defined phases: benzodiazepines as first-line treatment, non-benzodiazepine antiepileptics as second line if status epilepticus persists, and general anesthetics in refractory cases.

Conclusion

Rapid and proper management, timely medication, and continuous monitoring are key to reducing complications, preventing relapse, and improving outcomes.

Keywords: emergency department; epileptic; seizure; status

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DIAGNOSTIC APPROACH TO ACUTE APPENDICITIS IN THREE EMERGENCY DEPARTMENTS: VALUE OF IMAGING, CLINICAL SIGNS, AND LABORATORY MARKERS

***Ivan Gornik[1], Marinka Otočan[2], Medjit Smailji[2], Hana Franić[1], Danjela Palac[3], Nina Ivančić[3], Maša Sorić[3], Martina Pavletić[2]**

Abstract

Acute appendicitis is a common cause of abdominal pain, and timely diagnosis relies on integrating clinical assessment, laboratory tests, and imaging, particularly ultrasound (US) and computed tomography (CT). In contemporary emergency care, the key challenge is to achieve high diagnostic accuracy while limiting CT-related radiation exposure, especially in younger patients and those requiring repeated imaging.

Methods

We performed a retrospective observational study of 366 adult patients diagnosed with acute appendicitis in three emergency departments over a 6-month period. Clinical presentation (typical pain, right lower quadrant tenderness, peritoneal signs, fever), white blood cell count and C-reactive protein (CRP) were recorded. Initial imaging strategy (US-first vs CT-first), test results, and subsequent imaging escalation were analyzed.

Results

Among 366 patients (median age 37 years), right lower quadrant tenderness and pain migration were the most frequent clinical signs (58.6 %), whereas classic peritoneal signs were less common (53.4 %). Elevated white blood cell count was present in the majority (73.3 %) of cases and CRP was elevated above 50 mg/L in only 38.8 % patients and above 96 mg/L in 23.5 %. Ultrasound was used as the first-line imaging method in 351 (95.9 %) cases, with non-visualization of the appendix or uncertain result in 99 (28.2 %) exams. CT was performed in 115 (31.1 %) patients, of whom 19 (16.5 %) were ordered after a positive ultrasound report for appendicitis. Surgical opinion overruled the diagnosis made in ED in 7 cases. In 6 patients surgery revealed no appendicitis; CT was not performed in any of them.

Conclusion

An ultrasound first strategy across three emergency departments enabled accurate appendicitis diagnosis in most patients while restricting CT use to one third of cases. Seven patients were wrongly diagnosed with appendicitis; none had undergone CT, highlighting the residual risk of over-diagnosis within low radiation diagnostic pathways and the need for careful surgical–radiologic concordance.

Keywords: abdominal CT; appendicitis; imaging; ultrasound

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DIAGNOSTIC CHALLENGE IN THE EMERGENCY DEPARTMENT: CERVICAL SPINE FRACTURE PRESENTING AS STROKE – A CASE REPORT

***Sabina Rendulić**[1]

Abstract

In the majority of patients presenting in the emergency department (ED) with impaired level of consciousness and hemiparesis acute, ischemic stroke is confirmed as final diagnosis. However, various conditions with similar symptoms can mimic acute ischemic stroke. This case presents a cervical spine injury as one of the cause, complexity of management and diagnostic challenge in the ED.

Case report

The patient was admitted to the ED by emergency medical services due to altered level of consciousness, head trauma, and ischemic changes in electrocardiography (ECG). On admission, she had altered level of consciousness with a Glasgow Coma Scale score of 6, was agitated, hemodinamically stable with a visible parietal scalp laceration and plegia of the left arm and leg. Additional findings of physical examination included irregular pulse and leg edema, ECG showed atrial fibrilation and inferolateral ST-segment depression. Immediately, following the initial evaluation, patient was intubated using rapid sequence induction (RSI) protocol with manual in line stabilisation (MILS), mechanical ventilation and appropriate therapy was initiated. In consultation with attending neurologist, computed tomography was performed according to neurointervention protocol. Computed tomography (CT) of the brain excluded intracranial hemorrhage and ischemia. CT carotid angiography and cerebral angiography demonstrated reduced contrast opacification of the basilar artery, a multifragmentar odontoid fracture extending to the C2 arch, epidural collection, and prevertebral soft tissue swelling suggestive of hematoma. After the diagnosis was confirmed, therapy was continued, included intravenous fluids, electrolite replacement, antiemetic, analgosedation, protrombin complex concentrate. The patient was subsequently referred to a neurosurgeon and admitted to the intensive care unit.

Conclusion

Traumatic cervical spine injuries can imitate cerebrovascular events. Careful neurological examination, high level of suspition, clinical judgment, rapid imaging and coordinated multidisciplinary approach are essential for achieving appropriate and timely diagnosis leading to immediate treatment, and minimizing long-term neurological complications.

Keywords: acute hemiplegia; cerebrovascular insult; neuroimaging

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DIAGNOSTIC PERFORMANCE OF GFAP AND UCH-L1 IN MILD TRAUMATIC BRAIN INJURY ACROSS DIFFERENT AGE GROUPS

***Erika Ptičar[1], Alen Šarić[1], Mate Lerga[1-2], Vesna Šupak-Smolčić[1], Lidija Bilić-Zule[1], Martina Pavletić[1-2]**

Abstract

Abstract: Computed tomography (CT) is the gold standard for evaluation of traumatic brain injury (TBI). Approximately 80 % of CT's in TBI patients are negative. Blood-based biomarkers, glial fibrillary acidic protein (GFAP) and ubiquitin C-terminal hydrolase-L1 (UCH-L1) are objective indicators of brain tissue damage, potentially reducing unnecessary CT imaging. The aim of this study was to determine the diagnostic accuracy of GFAP and UCH-L1 across different age groups in patients presenting to the Emergency Department (ED) with mild TBI (mTBI).

Methods

Methods: The study was conducted between May 2025, and January 2026 in the ED and Clinical Department of Laboratory Diagnostics of a tertiary regional hospital. Study included 929 patients (553 M), median age 61 (18-100) years, admitted within 12 hours of mTBI. The leading mechanisms of injury were ground-level falls (53 %), traffic accidents (18 %), falls from height (12 %), and physical assault (6 %). Serum biomarkers were determined using Alinity-i (Abbott Laboratories, Illinois, USA). Results were interpreted according to the manufacturer's cut-off values. GFAP ≥35.0 ng/L and/or UCH-L1 ≥400.0 ng/L indicate positive finding. Both markers below the cut-off indicate negative finding. MedCalc program (MedCalc, Ostend, Belgium) was used for statistical analysis.

Results

Results: Biomarker use reduced the number of CT scans by 35.63 %. With a 4.4 % prevalence of positive CTs findings, diagnostic performance (95 % CI) was: sensitivity 100 % (91-100 %), specificity 8 % (6-10%), positive predictive value (PPV) 7 % (7-7 %), negative predictive value (NPV) 100 % (92–100%), and overall accuracy 14% (11-17 %). Specificity by age group was: 18-65 years (N=532) 17% (12-22 %), 66-80 years (N=229) 2 % (0.3-5 %), 81-90 years (N=138) 0.8 % (0-5 %), and 91-100 years (N=30) 0 %.

Conclusion

Conclusion: GFAP and UCH-L1 are reliable tools for ruling out the need for CT in mTBI patients due to excellent sensitivity and NPV. Low specificity limits their clinical applicability for confirmation of mTBI, highlighting the need for further research.

Keywords: biomarkers; blood; computed tomography; mTBI

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DIFFERENTIAL DIAGNOSIS OF HEADACHE IN THE EMERGENCY DEPARTMENT

***Vlasta Vuković Cvetković[1-2]**

Abstract

Acute headache is a common symptom reported by patients presenting to the emergency department (ED). The primary role of ED physicians is to discriminate between primary and secondary headaches. A detailed history (headache onset, duration, severity, quality, comorbidities, therapy) and physical examination can distinguish between key features of a benign primary headache (the diagnosis is clinical) or life-threatening secondary headache. In most of the cases, headache is benign and has a primary origin, with migraine (status migrainous) as the most common diagnosis in ED followed by cluster headache. Suspicion and diagnostic workup of secondary headache relies on a patient's medical history; "red flags" include: systemic symptoms including fever; neoplasm history, focal neurologic deficit, impaired consciousness, abrupt onset, new headache pattern, onset after 50 years, positional headache, headache precipitated by Valsalva maneuvers or exercise, presence of papilledema, progressive headache not responding to usual treatment, pregnancy or puerperium, painful eye with autonomic features, posttraumatic onset of headache. Imaging findings are more likely to be abnormal in patients presenting with a "thunderclap" headache, and may reveal subarachnoid hemorrhage, reversible vasoconstriction syndrome, pituitary apoplexy, parenchymal hemorrhage, sinus venous thrombosis, posterior reversible encephalopathy syndrome, or encephalitis. Alterations in intracranial pressure that are related to idiopathic intracranial hypertension tend to present with slow onset headache but in spontaneous intracranial hypotension the onset is often acute.

Conclusion

For emergent evaluations, non-contrast computed tomography of the head is recommended to exclude acute intracranial pathology. A lumbar puncture is indicated in the suspicion of intracranial bleeding or infection. Pharmacological parenteral treatment remains the principal approach, with NSAIDs, neuroleptic antinauseants, triptans and corticosteroids, tailored to the specific headache type. Opioids should be avoided. Referral of the patient to a Headache Center subsequently is recommended.

Keywords: acute headache; neurological emergency; red flags

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DIGOXIN TOXICITY IDENTIFIED BY EMERGENCY MEDICAL SERVICE: A CASE REPORT

***Dora Meštrović[1], Marija Kostanjski[1], Drinko Granić[1]**

Abstract

Digoxin is a widely used drug for rate control in patients with atrial fibrillation (AF) and concommitant heart failure (HF). However, it has a narrow therapeutic window, and its levels are markedly influenced by renal function, drug-drug interactions, and other comorbidities. Side effects include an array of gastrointestinal, neurological and cardiac symptoms, but are often nonspecific making early recognition challeging. The mainstay of therapy is the use of digoxin immune Fab.

Case report

A 74-year old woman was evaluated by emergency medical services (EMS) for diarrhea, vomiting and weakness. Two weeks earlier, she had been hospitalized for acute HF with newfound AF, and was discharged on furosemide 500mg and digoxin 0.25mg daily. On EMS arrival, she was hypotensive with a bradycardic AF and scooped ST-segment denivelations. Given the recent digoxin initiation and clinical presentation, digoxin toxicity was suspected. Intravenous atropin was administered with significant improvement in heart rate and blood pressure. Upon admission, digoxin level was 3.6 ng/mL (normal range 0.5-0.9 ng/mL) and an acute renal injury was identified. The patient was treated with digoxin immune Fab and underwent hemodialysis for uremia. Cardiac rhythm and renal function subsequently improved and guideline-directed medical therapy for HF and AF was initiated.

Conclusion

This case highlights the importance of EMS recognition of possible digoxin toxicity in elderly patients presenting with gastrointestinal symptoms and bradycardia. Symptoms of digoxin toxicity and associated ECG findings, although often nonspecific, should remain a constant consideration during out-of-hospital emergency evaluation of patients recieving this medication. Early prehospital identification and communication may expedite definitive therapy and improve outcomes.

Keywords: digoxin immune Fab; digoxin toxicity

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DISASTER RESPONSE CASELOAD ANALYSIS: EXPERIENCE OF THE SINGAPORE EMERGENCY MEDICAL TEAM (SGEMT) ACUTE CARE AREA FOLLOWING THE 2025 SAGAING, MYANMAR EARTHQUAKE

***Li Juan Joy Quah[1], Guek Gwee Sim[2], Shu Fang Ho[1], Muhammad Rakib Bin Muhammad Ridhuan[2]**

Abstract

A magnitude 7.7–7.9 earthquake struck Myanmar's Sagaing Region on 28 March 2025, causing over 3.600 deaths, 4.800 injuries, and leaving two million people in need of humanitarian assistance. Following the Myanmar government's request for international aid, the Singapore Emergency Medical Team (SGEMT), a World Health Organization (WHO)-verified Type 1 fixed Emergency Medical Team (EMT), was deployed. This report describes the acute care caseload managed during the immediate post-disaster phase, informing future EMT deployments.

Methods

SGEMT provided medical care for 1803 patients from April 8 to April 14, 2025. This study is a retrospective analysis of the patient encounters logged within the priority 1, acute care area of the SGEMT facility.

Results

The priority 1 acute care area managed 34 patients over 8 days. There were 16 patients (47.1 %) aged ≥65 years, 12 (35.3 %) aged 18–65 years, and 6 paediatric patients (17.7 %) aged ≤18 years. Only 14.7 % (n=5) of cases were earthquake-related, while 85.3 % (n=29) were non–event-related. The most common presentations were infectious, including respiratory, gastrointestinal, and chickenpox infections (41.2 %, n=14), followed by non-infectious medical emergencies (35.3 %, n=12). Importantly, 32.4 % (n=11) of acute cases were due to exacerbations of pre-existing chronic conditions (e.g., chronic obstructive pulmonary disease, COPD/asthma, hypertensive emergencies, congestive cardiac failure) resulting from disrupted primary care and medication access. Common interventions included 12-lead ECG (55.9 %, n=19), capillary blood glucose (23.5 %, n=8), oxygen therapy (20.6 %, n=7), and bedside ultrasound (14.7 %, n=5). Patient disposition was evenly split between referral (44.1 %, n=15) and discharge (44.1 %, n=15), with 11.8% (n=4) discharged against medical advice.

Conclusion

The SGEMT experience shows that post-disaster acute care demand was predominantly driven by non–event-related medical emergencies and exacerbations of chronic disease rather than trauma. The high exacerbation rate (32.4 %) highlights the impact of disrupted primary care and medication access. Future EMT deployments should prioritize internal medicine capacity, essential medication supply chains, and integrated primary care alongside to reduce morbidity and mortality.

Keywords: disaster medicine; EMT; humanitarian response

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DOES ANYONE STILL ASK IF WE NEED HEMS? ONE YEAR OF REAL-WORLD DATA FROM SPLIT BASE

***Andrija Babić[1], Leo Luetić[1], Ivan Lovrinčević[2]**

Abstract

Helicopter emergency medical service (HEMS) represent a cornerstone of advanced prehospital care in geographically demanding regions. The HEMS base in Split covers a highly complex operational area, including a remote and underserved villages, mountainous hinterland, and numerous inhabited adriatic islands. The aim of this study was to analyze the operational profile and mission patterns of the Split HEMS base during 2025 using *e-Hitna* program.

Methods

This observational study analyzes all HEMS missions performed by the Split base and recorded within the *e-Hitna* program between January 1 and December 31, 2025. Missions were retrospectively reviewed and categorized according to the primary reason for dispatch.

Results

Total of 888 HEMS interventions were recorded in analyzed period. The majority of missions (660; 74.3 %) were related to acute medical illnesses, underscoring the dominant role of HEMS in managing time-critical non-traumatic conditions. Trauma-related missions were less frequent but clinically significant, including 100 interventions due to non-traffic-related injuries and 73 interventions resulting from traffic accidents. Pregnancy-related emergencies accounted for 15 missions, while 3 missions were dispatched for cases of acute poisoning. An additional 26 missions were classified as other indications. Importantly, 11 dispatches were identified as unnecessary activations, indicating potential areas for improvement in dispatch criteria and resource utilization.

Conclusion

Our results confirm that HEMS services extend well beyond trauma response. The predominance of interventions related to acute medical illnesses is likely influenced by a high proportion of secondary missions, as helicopter transport represents the fastest, and often the only viable means of hospital access for patients from remote islands and isolated communities. This geographic reality underscores the indispensable role of HEMS in ensuring equitable access to definitive care. Continued refinement of dispatch criteria, alongside sustained investment in system integration and medical expertise, is essential to balance resource utilization with patient-centered outcomes.

Keywords: dispatch; HEMS; islands; prehospital

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DOES TINNITUS HIDE SOMETHING MORE SERIOUS? – A CASE REPORT OF A PATIENT WITH CEREBELLAR INFARCTION

***Jan Težak[1], Petra Terzić[1]**

Abstract

Cerebellar infarction is a condition of reduced blood flow through the cerebellum, due to lesions of the superior cerebellar, anterior inferior cerebellar, or posterior cerebellar arteries. It accounts for only 2 to 3% of the total number of cerebrovascular insults each year.

Case report

A 65-year-old male patient presented to the emergency department due to dizziness, vomiting, headache, and tinnitus. The symptoms began with dizziness upon waking up 2 days prior, followed by periodic vomiting. The dizziness was constantly present for the next 2 days, exacerbated by head movement. The headache was described as diffuse pressure. Upon physical examination, no other neurological deficits, nor other physical signs of illness were observed. Regarding prior illnesses, the only known condition in the patient was benign prostatic hyperplasia. On the emergency CT scan, a hypodense zone of acute ischemia was observed in the right cerebellum, with no other abnormalities. The patient was admitted to the neurology department, where he was hospitalized for 5 days. Neurosonological workup revealed atherosclerotic morphological changes in the carotid and vertebral arteries. A consultative examination by an otorhinolaryngologist found no ear, nose, or throat (ENT)-related pathology. During the emergency department workup and further hospitalization. Elevated values of Gamma-glutamyl transferase (GGT) and aspartate aminotransferase (AST), total and conjugated (direct) bilirubin, as well as low-density lipoprotein (LDL) values were observed. A consultative examination by a gastroenterologist and an abdominal ultrasound ruled out any pathological occurrences in the abdomen. During hospitalization, the initial symptoms regressed, and the patient was discharged with therapy consisting of acetylsalicylic acid and rosuvastatin for the purpose of secondary prevention of cerebrovascular events; a diet with reduced salt and fat intake was also recommended.

Conclusion

Although many other etiologies for the symptoms described may seem more likely, it is important to consider rare neurological conditions in the differential, and not skip the crucial step of neuroradiological diagnostics.

Keywords: cerebellar infarction; stroke; tinnitus

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THE REACTION OF THE ENTIRE HEALTH SYSTEM TO THE BINOMIAL: REFUGEE CRISIS–RISK OF INFECTIOUS DISEASES. WHY NOT OUR COUNTRY AS PART OF THE MEDITERRANEAN REGION!

***Ermira Muco[1], Besiana Hysi[1], Jonida Kito[1]**

Abstract

Human migration is a global phenomenon. Our country experienced a major migration process after the 1990s with the fall of communism. Our emigration in the world and the movement in the opposite direction (immigrants from the Middle East, sub-Saharan Africa, etc.).

Methods

To study the relationship between immigration and the occurrence of infectious pathologies in our country. We conducted a broad and systematic review of Albanian and foreign literature and described the epidemiological profile of infectious diseases among immigrants, refugees or asylum seekers and the main risk factors associated with the occurrence of infectious diseases and their effects on public health.

Results

The etiological and nosological spectrum of infectious diseases is wide. Albania is a country without autochthonous malaria, so the registered cases are imported (foreigners living here / year 1994; Albanian refugees in Equatorial Guinea / year 2012). Albania's exposure to the cultures of the modern world paved the way for sexually transmitted diseases (STDs). The first human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) were diagnosed in 1993 in two Albanian immigrants in Greece. The year 1995 marked the introduction of syphilis, which had been eradicated in our country since 1972. The cholera epidemic (a consequence of imported cholera) in 1994 was concentrated in 14 districts of the country. Over 500 thousand refugees came to Albania in 1999, and among them were reported bloody/bloodless diarrhea, acute respiratory infection, measles, unexplained fever, etc.

Conclusion

Infectious diseases are important health problems among the immigrant/asylum seeker/refugee population. It is important to know the topography of infectious diseases in the country of origin. Despite the fact that Albania remains somewhat unaffected by these infectious pathologies, their recognition is a task in the era of globalization.

Keywords: asylum; emigrants; immigrants; infectious; seekers

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MEDICAL EDUCATION IN CROATIA: WHERE WE ARE, WHAT'S NEXT, AND HOW TO GET THERE

***Ksenija Kos**[1]

Abstract

Over the last century, medical education has moved from apprenticeship and time-based training toward outcomes that can be observed, assessed, and trusted in real clinical work. This presentation offers a concise historical perspective on the major shifts that shaped modern medical training such as scientific rigor, standardized skills assessment (e.g., OSCEs), and active learning that strengthens clinical reasoning. The presentation then offers a constructive snapshot of Croatia's strengths and opportunities. Croatia has a strong scientific foundation, dedicated clinician-educators, and important local innovations in clinical skills and simulation-based teaching. At the same time, common challenges remain - variable clinical exposure and supervision across sites, limited structured observation of practical and communication skills, and insufficient protected time and development pathways for faculty. I will highlight how modernization can be accelerated through partnerships. The Croatian American Medical Alliance (CROMed-USA) is expanding simulation-based training for medical students and young physicians in Croatia, using structured scenarios and debriefing-based learning to support readiness for practice and patient safety. The talk concludes with a practical 21st-century toolkit: Competency-Based Medical Education (CBME), Entrustable Professional Activities (EPAs), programmatic assessment, simulation with mastery learning, team-based and interprofessional training, faculty development, and digital/AI literacy. I will conclude with a feasible 12-24-month roadmap of small pilots that can scale nationally.

Conclusion

Medical education in Croatia can "catch up" efficiently by building on existing strengths and partnerships (including CROMed-USA), adopting competency-based methods, structured assessment, and simulation, and implementing a feasible 12-24-month roadmap of scalable pilot initiatives to improve readiness for practice and patient safety.

Keywords: competency-based medical education (cbme)**;** entrustable professional activities (epas); faculty; simulation

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ACUTE ISCHEMIC STROKE PRESENTED AS A PERIPHERAL FACIAL NERVE PARALYSIS: A CASE REPORT

***Domagoj Bukvić[1]**

Abstract

Nuclear and infranuclear damage to the facial nerve results in loss of motor function affecting the entire ipsilateral half of the face. Clinical features include flattened forehead wrinkles, lowered eyebrow, inability to raise the eyebrow or close the eye, flattened nasolabial fold, drooping of the mouth corner, deviation of the lips toward the healthy side, and a slanted philtrum. In contrast, central facial palsy typically spares the forehead and warrants neuroimaging to exclude stroke. Rarely, brainstem stroke may present with peripheral facial nerve palsy accompanied by ipsilateral gaze palsy.

Case report

Emergency medical services were called for a 37-year-old woman with unsteady gait, facial asymmetry, and dysarthria. Her medical history included type 2 diabetes, hypertension, and hyperlipidemia. Three days earlier, she experienced vertigo and discontinued her chronic medications, attributing her symptoms to therapy. On examination, blood pressure was 180/120 mmHg, other vital signs were normal. Neurological assessment revealed right peripheral facial nerve palsy, positive Romberg sign with swaying to the right, broad-based gait, right-sided dysmetria, horizontal nystagmus with a fast component upward and to the left, and a positive head impulse test to the right. Brain computed tomography (CT) demonstrated acute ischemia in the right cerebellum. Magnetic resonance imaging (MRI) was ordered, but the patient declined hospitalization. Three days later, she returned for MRI reporting nausea, vomiting, and diplopia. Examination showed rightward gaze paresis as a new symptom. T2/FLAIR sequences demonstrated hyperintense lesions corresponding to the areas of the anterior inferior and superior cerebellar arteries.

Conclusion

Peripheral facial nerve palsy is a common emergency presentation, which may obscure rare but serious central causes. Careful neurological examination and timely neuroimaging are essential to establish the diagnosis and initiate appropriate management.

Keywords: emergencies; facial paralysis; ischemia; stroke

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PAIN SYMPTOM IN PATIENTS WITH HERPES ZOSTER AS A CAUSE OF MISDIAGNOSIS IN THE EMERGENCY DEPARTMENT

***Ermira Muco[1], Jonida Kito[1]**

Abstract

Herpes zoster is an infectious pathology that results from the reactivation of the varicella-zoster virus with neurocutaneous manifestation in the form of vesicles that follow the trajectory of the sensory branches of the cerebral ganglia, dorsal roots of the spinal. The incidence varies from 4-4.5/1000 persons/year, with a higher rate in patients with compromised immunity. The symptom of pain, especially before the onset of cutaneous elements, can mimic other non-infectious pathologies that can lead emergency physicians to incorrect diagnoses.

Methods

Let us underline the importance of a complete clinical evaluation by an emergency physician of a patient presenting with the symptom of pain. Let us highlight the importance of accurate and timely diagnosis for the most professional treatment.

Results

Pain is a symptom that appears before the onset of skin lesions. It is responsible for the immune and inflammatory response. It is localized in the area of the involved dermatome and can involve one or more dermatomes. The authors report that 12.3% of patients are misdiagnosed in the emergency room. The differential diagnosis before herpetic eruption (pain according to the topography of dermatomes) includes acute pancreatitis/acute cholecystitis/perforated gastric ulcer/mesenteric thrombosis/acute appendicitis/ovarian apoplexy/renal colic in the involvement of thoracic dermatomes. Chest pain is a common complaint in the emergency department and must be differentiated from myocardial ischemia. Severe headache when cranial dermatomes are affected must be differentiated from cerebral hemorrhages, tension headache, migraine, giant cell arteritis, etc. The symptom of pain orients the emergency room towards a hasty decision to operate and unnecessary coronarography. Pain treatment includes nonsteroidal and steroid anti-inflammatories, opioid analgesics, gabapentin, amitriptyline, tramadol, etc.

Conclusion

Emergency physicians must be careful when managing these patients to avoid misdiagnosis.

Keywords: coronarography; herpes; pain; unnecessary; zoster

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HEADACHE AND FEVER AS EMERGENCY MANIFESTATIONS IN PATIENTS WITH TEMPORAL ARTERITIS

***Ermira Muco[1], Besiana Hysi[1]**

Abstract

Temporal arteritis is inflammation and damage of the blood vessels that supply blood to the head. Temporal arteritis can cause a wide variety of symptoms that may affect the eyes, head, face and body in general, mentioning here also and fever. Temporal arteritis is more common in people older than age of fifty, and it affects women more often than men.

Case report

A 67 years-old man was presented to the emergency department with severe headache, eye pain, and high fever for several days. The scalp was sensitive at touch and a unilateral nodule in the right temporal. Characteristic laboratory findings included: elevated ESR 45mm/h; high level of C-reactive protein 36 mg/L; anemia: hemoglobin level of 11.7 g/dL, red blood, cell 3970000/uL; white blood cell count 17700/uL; glucose level 176 mg/dL; thrombocytosis 522000/μL; high level of fibrinogen in the blood 743mg/dL; the protein electrophoresis resulted: albumin 42.7 %; α1 4.3 %, α2 21.5 %, β 12.9 %, γ 18.6 %. CT of head was normal. Blood cultures were sterile as well as serologies for a range of infectious diseases. Doppler echo of temporal artery provide data for temporal arteritis. The only complication was visual loss in both eyes (OD 7/10, OS 7/10). Low-dosage prednisone improves the symptoms very fast.

Conclusion

High fever and headache should guide emergency physicians towards a diagnosis such as temporal arteritis.

Keywords: emergency department; fever; headache; temporal arteritis

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UNCLEAR PROBLEM IN CRITERIA-BASED DISPATCH

***Radmila Majhen Ujević[1], Ivan Brdar[2], Zoran Vidović[1], Leo Luetić[1]**

Abstract

Medical dispatch unit (MDU) in Split Dalmatian County receives calls according to symptoms presented by a caller, assesses a criteria and dispatches adequate response - red, yellow, green. Croatian Index for Emergency Call Admissions consists of symptoms divided into 37 chapters. We wanted to find out which final diagnosis was made by physician in the field (Team 1) after he had been dispatched to the red criteria in chapter A.05 - unclear problem.

Methods

Retrospective quantitative and qualitative analysis of eRinels (programme support) database of calls and medical records of Split unit in one-year period (2025). We counted total number of calls which resulted with Emergency medicine service (EMS) alert, with special consideration on A05 - unclear problem. We wanted to see what diagnosis according to International Classification of Disease, especially the share of „lethal" diagnoses (R96, I46) - sudden (cardiac) death as well as diagnosis concerning acute coronary syndrome and cerebrovascular incidents were set in the field..

Results

There were 9.215 calls to MDU in 2025 year with consequent red EMS response, There were 1.476 calls taken as A05 - unclear problem (16,01%). There were 21 diagnosis I21 - acute myocardial infarction (1,4 %). There were 27 of R07 - pain in throat and chest (2,3 %). Syncopa (R55) was established in 198 cases (18,5 %). There were 120 diagnosis R96 (sudden death of unknown origin - 8,1 %) and 27diagnosis I46 (1,8 %) (sudden death of cardiac origin).

Conclusion

Re-listening of calls in purpose of qualitative feedback, more thorough asking additional questions and more compliance to Index standard should diminish the share of "unclear problems" in total criteria assessment. Regular training is crucial in recognizing agonal breathing. Recognition of possible OHCA might " clear the problem" and provide earlier telephone CPR management.

Keywords: criteria; dispatch; EMS; response; unclear

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SHOULD I STAY OR SHOULD I GO? A RISK-BASED GUIDE TO SYNCOPE DISPOSITION IN THE ED

***Murat Ersel**[1]

Abstract

Syncope is a clinical syndrome characterized by a sudden onset, short duration, and spontaneous recovery of consciousness, accounting for approximately 1–3 % of all emergency department (ED) visits. A significant majority of patients presenting with syncope exhibit a completely normalized clinical appearance upon arrival at the ED; this baseline status often obscures the identification of underlying chronic pathologies and serious etiologies during the initial assessment. The etiology of syncope encompasses a broad spectrum, ranging from benign conditions such as vasovagal and orthostatic episodes to life-threatening pathologies including malignant arrhythmias and structural heart diseases. This heterogeneous nature renders the clinical risk assessment of syncope patients in the ED a complex and critical process. The primary objective of syncope management in the ED is the early and accurate identification of patients at risk of short-term mortality or severe morbidity. Literature indicates that short-term mortality rates following syncope range between 1–5 % in the general population, whereas this rate increases significantly in cases of cardiac syncope. Furthermore, a substantial portion of serious clinical events is reported to emerge within the days and weeks immediately following the ED presentation. Therefore, establishing a reliable risk stratification in the early phase is of paramount importance for patient safety.

To meet this clinical need, various conventional risk scoring systems have been implemented. The San Francisco Syncope Rule and the Canadian Syncope Risk Score are among the most frequently utilized risk assessment tools in emergency settings. These scores are structured instruments that utilize patient history, physical examination findings, electrocardiographic changes, and core clinical parameters to predict adverse short-term clinical outcomes.

A defining characteristic of these conventional systems is their reliance on a limited number of predefined variables. While this approach facilitates rapid decision-making under ED conditions, it may fail to adequately capture multidimensional and complex clinical patterns. Consequently, this can lead to an imbalance between sensitivity and specificity in predicting short-term mortality and morbidity, particularly within heterogeneous patient groups. In the risk assessment of syncope patients, the observation window is critical. The first 7 days post-ED visit are considered the highest-risk period for malignant arrhythmias and sudden clinical deterioration. Additionally, a 30-day follow-up period provides a meaningful timeframe for evaluating early mortality risk and the clinical manifestation of underlying serious cardiac or systemic pathologies.

In recent years, artificial intelligence (AI) and machine learning (ML) based methodologies have gained increasing prevalence in the medical field. These methods possess the potential to simultaneously analyze numerous clinical variables and uncover non-linear relationships between them. It has been reported that models trained on large datasets can achieve higher predictive accuracy compared to traditional risk scoring systems. While conventional scores rely on restricted variable sets, AI models can integrate multidimensional clinical data, including demographics, vital signs, electrocardiographic changes, and laboratory results. In environments such as the ED, where rapid and time-constrained decision-making is essential, AI-powered models are expected to provide significant contributions to the risk stratification of syncope patients. It is anticipated that this approach will enable a more precise prediction of short-term mortality and morbidity risks.

Conclusion

In conclusion, whether utilizing rule-based algorithms or AI-driven decision systems, these tools—when combined with comprehensive physical examination and accurate history-taking—represent valuable clinical practices for reducing short-term mortality in syncope patients. The standardization of these applications in clinical use is essential to enhance patient outcomes and mitigate risks.

Keywords: artificial intelligence; emergency department; risk stratification; syncope

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AI-BASED CLINICAL DECISION SUPPORT SYSTEMS IN THE ED: CURRENT LANDSCAPE AND FUTURE HORIZON

***Murat Ersel**[1]

Abstract

Emergency departments (EDs) worldwide are facing escalating challenges due to overcrowding, staffing shortages, and the imperative for rapid, accurate clinical decision-making. Currently, Artificial Intelligence (AI) is emerging as a critical solution to these issues by augmenting human performance across various dimensions of emergency medicine.

The utilization of AI-based Clinical Decision Support Systems (CDSS) in the ED primarily focuses on optimizing triage accuracy, reinforcing diagnostic and prognostic decision-making, and facilitating safer discharge planning.

Despite this potential, the majority of AI-enabled Clinical Decision Support (AI-CDS) research in emergency settings remains in the early stages of "pre-clinical development." The scarcity of prospective studies tested with real-time data highlights a significant gap in the practical application of AI for decision-making within the emergency department.

Current research on CDSS in the ED is concentrated in areas such as triage, hospital admission and mortality prediction, as well as the management of time-sensitive conditions including sepsis, acute coronary syndromes (ACS), stroke, and cardiac arrest. These systems employ a wide range of methodologies, from traditional machine learning techniques to advanced Natural Language Processing (NLP) and Large Language Models (LLMs).

It is now readily foreseeable that in the near future, AI-based decision support systems will mature into integrated tools that work seamlessly alongside clinicians in the high-pressure environment of the emergency department.

Despite these advancements, the "future horizon" of AI in the ED faces several critical hurdles. Key challenges include ensuring model generalizability across diverse patient populations, maintaining data privacy, and mitigating algorithmic bias.

Keywords: artificial intelligence; clinical decision support systems; emergency department; machine learning; triage; predictive modeling

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CARDIAC ARRREST AND SYSTEMIC REPERFUSION. HOW TO SAVE THE BRAIN?

***Abel Papp [1,3], Levente L. Horváth[1], Dorina Kiss[1], Zsofia Nagy[2], Endre Czeiter [1], Kira Ritter[1], Zoltan Vamos [1,3]**

Abstract

Sudden cardiac arrest remains a major cause of mortality worldwide. Despite successful resuscitation, nearly 60 % of patients die from neurological complications, and only a small proportion regain their previous functional status. In our presentation we conlcude thate the evidence suggests that a substantial proportion of neuronal injury develops during the reperfusion phase rather than during the ischemic period itself. In this context, early post-resuscitation management focusing on stabilization of haemodynamic parameters and preservation of cerebral perfusion may play a critical role in limiting secondary neuronal damage. In parallel, circulating neurobiomarkers such as S100B, glial fibrillary acidic protein (GFAP), and neuron-specific enolase (NSE) have emerged as promising indicators of neuronal and glial injury and may provide valuable information for early assessment of neurological damage and prognosis. Understanding the interaction between haemodynamic stability, molecular mechanisms of neuronal injury, and biomarker dynamics may contribute to improved monitoring and the development of targeted neuroprotective strategies following cardiac arrest.

Keywords: cardiac arrest; neurobiomarkers; neuroprotection; reperfusion injury

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POST-RESUSCITATION CARE: THE CRITICAL FIRST 72 HOURS

***Zoltán Vamos[1,3], Abel Papp[1,3], Dorina Kiss[1], Zsofia Nagy[2], Kíra Ritter[1], Endre Czeiter[1], Levente L. Horvath[1]**

Abstract

Post cardiac arrest acut brain injury is also known as a post-resuscitation syndrome. In this process, not only the initial hypoxia–ischaemia but also reperfusion injury following the return of spontaneous circulation (ROSC) or the initiation of artificially maintained circulation (VA-ECMO) plays a crucial role. In a substantial proportion of deaths after successful resuscitation, the dominant clinical problem is the loss of complex brain functions. Therefore, one of the central tasks of post-resuscitation care is the reliable assessment of neurological outcome and the support of clinical decision-making. The ERC-2025 guidelines emphasize a structured, multimodal neuroprognostic approach: clinical-, electrophysiological-, laboratory (neurobiomarker), and imaging datas. The aim of this strategy is to minimize falsely pessimistic prognoses, avoid unjustified limitation of treatment, and at the same time prevent the prolonged continuation of futile intensive therapy in cases of severe, irreversible brain injury. Overall, the recommendations consider standardized, multidisciplinary, stepwise neuroprognostication to be a key element of post-resuscitation care, with a focus on patient-centered management that reduces uncertainty and prioritizes long-term neurological outcomes.

Keywords: multimodal monitoring; neurobiomarkers; neuroprognostication; post–cardiac arrest syndrome

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POLYTRAUMA: ACTUALITY IN THE MANAGMENT OF SEVERE TRAUMATIC BRAIN INJURY. FROM PREHOSPITAL CARE TO ICU

***Levente L. Horvath[1], Abel Papp[1,3], Dorina Kiss[1], Zsofia Nagy[2], Kíra Ritter[1], Endre Czeiter[1], Zoltán Vamos[1,3]**

Abstract

Severe traumatic brain injury (TBI) is one of the leading causes of mortality and long-term disability, and outcomes depend significantly on coordinated care from the prehospital phase through intensive care. The primary goal of emergency medical services is the prevention of secondary brain injury, including atraumatic airway management, adequate ventilation, and cerebroprotective hemodynamic stability alongside rapid neurological assessment.

Although computed tomography (CT) plays a fundamental role in hospital diagnostic evaluation, novel approaches suggest that certain neuroproteins may also contribute to the detection of intracranial hemorrhage or mass lesions and to outcome prediction. Among biomarkers indicating central nervous system injury—such as S100B, glial fibrillary acidic protein (GFAP), and neuron-specific enolase (NSE)—a newly investigated protein, brain-derived TAU, has recently become a focus of research.

In this presentation, we aim to highlight key aspects of emergency care whose quality significantly improves the effectiveness of subsequent intensive care management.

Keywords: neurobiomarkers; polytrauma; prehospital care; traumatic brain injury

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TIMING OF VASOPRESSOR THERAPY IN SEPSIS

***Višnja Nesek Adam**

Abstract

Sepsis is a life-threatening condition characterized by dysregulated host response to infection and resulting organ dysfunction. In septic shock, persistent hypotension occurs despite adequate fluid resuscitation, requiring vasopressor therapy to maintain adequate tissue perfusion and mean arterial pressure (MAP), usually targeting ≥65 mmHg. Early initiation of vasopressors, particularly norepinephrine, has been increasingly emphasized in recent guidelines. Traditionally, vasopressors were started only after large volumes of intravenous fluids were administered. However, recent evidence suggests that excessive fluid resuscitation may worsen outcomes by causing fluid overload and tissue edema. Starting vasopressors earlier, sometimes simultaneously with ongoing fluid resuscitation,can help restore vascular tone, improve blood pressure more rapidly, and reduce the total amount of fluids required.

Early vasopressor use may also shorten the duration of hypotension, which is associated with lower risk of organ failure and mortality. Peripheral administration of vasopressors can be considered initially while central venous access is being obtained, provided appropriate monitoring is in place.

Conclusion

In conclusion, current evidence supports earlier initiation of vasopressor therapy in septic shock to stabilize hemodynamics, limit excessive fluid administration, and potentially **i**mprove patient outcomes.

Keywords: early vasopressors, sepsis, septic shock

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ALL QUIET ON THE PE FRONT?

***Ivan Gornik**[1]

Abstract

Pulmonary embolism (PE) remains one of the most diagnostically demanding conditions in emergency medicine — clinically protean, potentially lethal, and increasingly overinvestigated as CT pulmonary angiography (CTPA) utilization continues to rise. Despite this, recent years have brought meaningful refinements to diagnostic algorithms and treatment strategies, reshaping the approach to PE across the full risk spectrum.

On the diagnostic front, the YEARS algorithm has been formally incorporated into the 2025 ESC Guidelines as a pragmatic, evidence-based alternative to the traditional Wells-based pathway. By applying two distinct D-dimer thresholds according to the presence or absence of three clinical items, YEARS demonstrably reduces CTPA utilization without compromising safety — a clinically important advantage in overburdened emergency departments.

Our own institutional experience, retrospective analysis of 1.555 CTPA examinations performed in the emergency department, provides important real-world context. PE was confirmed in 17.9 % of scans. Strong negative association with pe was identified for concurrent diagnoses of acute heart failure (OR 0.141), chronic obstructive pulmonary disease (COPD) with hypercapnia (OR 0.062), and pneumonia. Notably, suggested higher D-dimer cut-offs in these subgroups maintained 100% sensitivity while substantially improving specificity, suggesting that context-adjusted D-dimer thresholds could safely reduce unnecessary imaging.

For low-risk PE, evidence from the HoT-PE trial, HESTIA criteria, and sPESI-guided protocols consistently supports early discharge and outpatient anticoagulation. We present our departmental data on implementation and discuss new opportunities and persistent barriers.

Finally, in high-risk PE, the evolving debate between systemic thrombolysis and catheter-directed mechanical thrombectomy is reviewed, incorporating the latest trial evidence and our institutional trends in managing hemodynamically unstable patients.

Keywords: CTPA utilization; D-dimer; ESC guidelines; low-risk PE; mechanical thrombectomy, thrombolysis; pulmonary embolism; YEARS algorithm

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URGENT DIAGNOSTIC AND THERAPEUTIC MANAGEMENT OF SYNCOPE

***Saša Ignjatijević**[1]

Abstract

Syncope represents a transient, short-term loss of consciousness that occurs suddenly, after which the patient most often recovers completely and spontaneously. According to data from the literature, 1–2 % of all emergency department admissions are related to individuals who have experienced syncope. Due to its dramatic presentation, it requires effective differentiation from more complex and severe forms of loss of consciousness. The cause of syncope lies in transient cerebral hypoperfusion and the consequent reduced delivery of oxygen and nutrients to the brain. According to the European Society of Cardiology, syncope is classified based on its causes into reflex, orthostatic, and cardiac types. Each of these categories can be further divided into several subcategories.

Reflex and orthostatic syncopes are most often caused by conditions that do not require complicated therapeutic interventions, in contrast to syncopes of cardiac origin, where the causes are divided into two categories: arrhythmias as a cause of syncope and structural heart abnormalities. Because of their complexity, these require urgent diagnostics and therapeutic procedures. During patient examination, it is necessary to collect anamnesis data regarding the event itself, as well as previous personal and family medical history. This is important for easier identification of the cause of syncope (for example, prodromal symptoms may indicate reflex syncope, while data on pre-existing heart disease, sudden cardiac death in the family, or congenital rhythm disorders may point to cardiac syncope).

A detailed description of the symptoms experienced by the patient before the onset of syncope provides more specific information about its origin. A thorough examination includes the assessment of vital signs and, depending on symptoms, additional neurological, abdominal, or possibly gynecological examinations, etc. Laboratory testing is also guided by the patient's history and physical findings. Diagnostic techniques are aimed at confirming or ruling out possible working diagnoses established on the basis of anamnesis and physical examination. Even after conducting all necessary examinations, in almost 40 % of cases, the true cause of syncope cannot be determined.

For such undiagnosed syncopes, it is important to assess the risk of recurrence with potentially severe outcomes (morbidity and mortality). To evaluate risk level, several scoring systems are used, the most well-known being the San Francisco Syncope Rule. In addition, the current classification by the European Society of Cardiology distinguishes between low-risk and high-risk syncopes. Based on this classification, appropriate diagnostic and therapeutic procedures are undertaken. For patients assessed as low risk, once their condition is stabilized, follow-up in primary healthcare is recommended. Individuals at high risk require hospitalization.

Keywords: cardiac syncope; orthostatic syncope; reflex syncope; risk stratification

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BEYOND THE BREAK: WHAT HIP FRACTURES TEACH US ABOUT TREATING PAIN IN THE ELDERLY

***Anđela Simić[1]**

Abstract

While a hip fracture is rarely immediately fatal, it marks the beginning of a high-risk clinical period; statistics show that one in 16 patients dies within the first month, with the annual mortality risk increasing three to four times compared to the general population. Among the numerous factors influencing this high morbidity and mortality, preoperative pain management remains critical. Despite its importance, recent studies still highlight the persistent phenomenon of oligoanalgesia in these patients.

At the same time, studies show the evolving role of peripheral nerve blocks (PNBs), specifically the Fascia Iliaca Compartment Block (FICB) and the PENG (Pericapsular Nerve Group) block, as essential tools in modern orthogeriatric care. Clinical evidence demonstrates that PNBs provide superior analgesia, particularly during patient movement, while significantly reducing the reliance on systemic opioids—which are associated with severe adverse effects in the elderly.

Furthermore, the implementation of these blocks is linked to a decreased incidence of postoperative delirium and pneumonia, as well as accelerated mobilization and reduced hospital stays. Most notably, effective pain control through PNBs is associated with lower one-year mortality rates. These benefits can be attributed to the attenuation of the body's systemic stress response through precise pain modulation. Ultimately, the lessons learned from hip fracture treatment underscore the vital importance of proper analgesia as a cornerstone of geriatric survival and functional recovery.

Keywords: hip fractures; nerve block; pain management

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SIMULATION-BASED EDUCATION FOR MANAGING MEDICAL EMERGENCIES IN PRIMARY HEALTH CARE: THE EXPERIENCE OF THE SIM CENTRE LJUBLJANA

***Uroš Zafošnik [1,4] Zalika Klemenc-Ketiš [1,2,3]**

Abstract

Medical emergencies represent an important but relatively infrequent component of work in primary health care. Because such situations occur rarely in daily clinical practice, primary care professionals may have limited opportunities to develop and maintain the practical skills and confidence required for effective emergency management. Simulation-based education offers a safe and structured environment where health care teams can practice technical and non-technical skills, including clinical decision-making, teamwork and communication. In response to these educational needs, the Ljubljana Community Health Centre established the Simulation Centre (SIM Centre) to provide structured training for primary health care teams.

Methods

The SIM Centre, established in 2014, provides simulation-based training for more than 1500 employees of the Ljubljana Community Health Centre. The educational programme is based on a comprehensive three-level model. The first level consists of classroom simulations using highly realistic three-dimensional patient simulators representing different age groups. Training scenarios focus on emergency situations relevant to primary care, such as cardiac arrest, trauma and childbirth. The programme combines theoretical instruction, manual skills training, high-fidelity simulations and structured debriefing. The second level involves in situ simulations conducted in the participants' actual workplace environment, allowing teams to practice using their own equipment and organisational procedures. The third level integrates augmented reality scenarios, enabling participants to recognise and manage rare but life-threatening conditions, such as anaphylactic shock, in a realistic and interactive learning environment.

Results

Simulation-based training enables health care teams to develop clinical competencies, improve manual dexterity and strengthen teamwork in emergency situations. The structured debriefing process supports reflective learning and helps participants identify potential safety risks and organisational weaknesses in emergency management. *In situ* simulations have also contributed to improved understanding of team roles and emergency protocols within the workplace. Furthermore, the use of augmented reality allows learners to experience dynamic clinical scenarios that are rarely encountered in routine practice, thereby improving recognition and management of critical conditions.

Conclusion

The simulation-based educational model implemented at the SIM Centre Ljubljana represents an innovative approach to training primary health care teams in the management of medical emergencies. The combination of classroom simulation, workplace-based training and augmented reality provides comprehensive and realistic learning opportunities. Such an approach supports continuous professional development and contributes to improving the quality and safety of patient care in primary health care settings.

Keywords: emergency; patients safety; primary health care; simulation training

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WHEN MINUTES DEFINE LIVES: TRAUMA CARE EVOLUTION IN 2026

***Ovidiu Alexandru Mederle[1,2], Carmen Williams[1]**

Abstract

Trauma remains a leading cause of death worldwide, particularly in individuals under the age of 45, accounting for more than five million deaths annually. While traditional mechanisms such as road traffic collisions remain significant, trauma epidemiology is evolving, with increasing numbers of elderly patients, low-energy mechanisms, and complex comorbidities. Simultaneously, advances in emergency medicine, trauma systems, and digital technologies are transforming how trauma patients are recognized and treated. This lecture aims to explore the evolving landscape of trauma care, focusing on time-critical interventions and system-level innovations that influence early survival in severely injured patients.

The presentation reviews current concepts in modern trauma management, including early hemorrhage control, damage control resuscitation, and physiology-guided transfusion strategies. Particular emphasis is placed on the role of point-of-care ultrasound, advanced airway management, and rapid imaging pathways in the emergency department. Emerging technologies such as artificial intelligence–assisted triage, hybrid trauma rooms, and real-time data integration between prehospital and hospital teams are also discussed. Special attention is given to changing trauma demographics, including geriatric trauma and pediatric considerations, as well as the growing importance of coordinated multidisciplinary trauma systems.

Conclusion

Modern trauma care is shifting from the traditional concept of the "golden hour" toward the recognition that the first minutes of coordinated action determine patient survival. Advances in trauma systems, precision resuscitation, and team-based emergency care offer the opportunity to significantly reduce preventable trauma deaths.

Keywords: artefitial intelligence;; damage control resuscitation; trauma systems; ultrasound

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EARLY MANAGEMENT OF CARDIOGENIC SHOCK IN EMERGENCY DEPARTMENT: BRIDGING EVIDENCE AND PRACTICE

***Ovidiu Alexandru Mederle[1,2] , Carmen Williams[1]**

Abstract

Cardiogenic shock represents one of the most severe forms of acute circulatory failure, with mortality rates remaining high despite advances in cardiovascular therapies. Early recognition and rapid hemodynamic stabilization in the emergency department are crucial to improving outcomes.

This lecture will review current evidence and practical approaches for the early management of cardiogenic shock in emergency departments, emphasizing rapid diagnosis and timely therapeutic interventions.

Key topics include the early identification of cardiogenic shock using clinical assessment, laboratory markers, and bedside echocardiography. The presentation will address current strategies for hemodynamic stabilization, including vasoactive agents, fluid optimization, and the early use of mechanical circulatory support. Special attention will be given to early revascularization strategies and multidisciplinary collaboration between emergency medicine, cardiology, and intensive care teams.

Conclusion

A structured, evidence-based approach to cardiogenic shock management in the emergency department can significantly improve patient outcomes. Early diagnosis, rapid hemodynamic stabilization, and coordinated multidisciplinary care represent the cornerstone of modern cardiogenic shock management.

Keywords: cardiogenic shock; echocardiography; hemodynamic stabilization; mechanical circulatory support

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NITROUS OXIDE TOXICITY: NEUROLOGICAL, HEMATOLOGICAL, AND EMERGENCY IMPLICATIONS

***Evvah Karakılıç**[1]

Abstract

Nitrous oxide (N_2O), commonly known as "laughing gas," is a colourless, odourless, non-flammable gas widely used in anaesthesia and the food industry. Despite its legitimate applications, recreational misuse has increased markedly in recent years, particularly among young adults. Due to its euphoric, relaxing, and mildly hallucinogenic effects, nitrous oxide has become a popular inhalant drug. The gas is widely available commercially and is typically inhaled via balloons filled from small cartridges, commonly referred to as "whippets" or "hippy crack."

The primary mechanism of nitrous oxide toxicity involves functional inactivation of vitamin B12. Nitrous oxide oxidises the cobalt ion within the cobalamin molecule, leading to inhibition of methionine synthase, an enzyme essential for DNA synthesis and myelin production. This process results in impaired cellular replication and neurological dysfunction. Because nitrous oxide inactivates rather than destroys vitamin B12, serum B12 levels may remain normal. Elevated homocysteine and methylmalonic acid levels are therefore more reliable indicators of functional B12 deficiency.

Chronic exposure may lead to a range of neurological, psychiatric, and hematological complications. Neurological manifestations include paresthesia, limb weakness, gait instability, and sensorimotor polyneuropathy, sometimes progressing to subacute combined degeneration of the spinal cord. Hematological findings may resemble megaloblastic anemia and may include leukopenia or thrombocytopenia. Psychiatric symptoms such as anxiety, depression, hallucinations, and delirium may also occur.

From an emergency medicine perspective, increasing recreational use presents a growing diagnostic challenge. Patients may present with nonspecific neurological symptoms while routine neuroimaging remains normal. Therefore, clinicians should maintain a high index of suspicion in patients with unexplained neurological deficits. Early recognition and prompt treatment are essential. Management includes cessation of nitrous oxide exposure and administration of high-dose intramuscular vitamin B12, which can lead to significant clinical improvement and reversal of neurological deficits.

Keywords: nitrous oxide; recreational use; vitamin B12 deficiency

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ECMO BEYOND INDICATIONS: CONTRAINDICATIONS AND CLINICAL DECISION-MAKING

***Evvah Karakılıç**[1]

Abstract

Extracorporeal membrane oxygenation (ECMO) has evolved from a rescue therapy traditionally used in cardiac surgery and intensive care units into an increasingly important intervention in emergency medicine. In recent years, the concept of emergency department–initiated ECMO has gained attention as systems of care develop and technological capabilities expand. However, while its clinical use has grown rapidly, uncertainty remains regarding appropriate patient selection, contraindications, and the ethical boundaries of its use.

ECMO is a highly resource-intensive therapy associated with significant complications, including bleeding, thromboembolic events, infection, and neurological injury. For this reason, careful patient selection is essential. Absolute contraindications generally include irreversible organ failure, untreatable malignancy, severe and irreversible neurological injury, and situations in which anticoagulation cannot be safely administered. In practice, however, many clinical decisions occur in a "gray zone," where strict criteria are difficult to apply and physicians must balance potential benefit against the risk of futile treatment.

Several controversial scenarios frequently arise in emergency ECMO decision-making. Age limits remain debated; although outcomes decline significantly after the age of 75, chronological age alone may not accurately reflect physiological reserve or functional status. Another major challenge is predicting neurological recovery in patients who have experienced prolonged cardiac arrest. While extended low-flow durations are associated with poor outcomes, restoring circulation through extracorporeal support may still provide an opportunity for neurological recovery in carefully selected patients.

Hemodynamic and metabolic parameters also play a critical role in determining prognosis. Severe metabolic acidosis, markedly elevated lactate levels, and prolonged dependence on high-dose vasopressors may indicate advanced circulatory collapse and a lower likelihood of meaningful recovery. In such cases, the risk of initiating ECMO may outweigh the potential benefits.

Ultimately, ECMO should not be viewed as a universal rescue therapy but rather as a bridge to recovery, decision, or definitive treatment. Effective use in the emergency setting requires rapid clinical assessment, multidisciplinary collaboration, and careful evaluation of reversibility and expected neurological outcomes. As ECMO continues to expand into emergency medicine practice, clinicians must balance technological capability with responsible clinical judgment to maximize meaningful survival while avoiding futile interventions.

"The most difficult ECMO decision is not when to start, but when not to."

Keawords: ECMO; emergency medicine; patient selection; prognosis

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ASSESSMENT OF THE ACCURACY OF TRIAGE DECISIONS AND THEIR IMPACT ON TREATMENT OUTCOMES AT THE UNIFIED EMERGENCY DEPARTMENT OF THE SPLIT UNIVERSITY HOSPITAL CENTER

*** Sara Vorkapić[1], Tomislava Maleš[1]**

Abstract

Triage is a crucial process in emergency departments, enabling prompt and effective classification of patients according to the urgency of their condition. This study assessed the accuracy of triage decisions and their impact on treatment outcomes of patients admitted to the emergency department of University Hospital Centre Split during December 2024. A total of 7.630 patients were included, with data collected from the hospital information system. Results revealed discrepancies between recommended and actual waiting times, especially in mid-level triage categories. Cases of undertriage and overtriage were identified, both affecting patient outcomes and department efficiency. The study highlights triage as a clinical tool directly influencing patient safety and healthcare performance and emphasizes the need for continuous improvement through staff education, regular evaluation, and implementation of electronic support systems.

Triage, as an organizational and clinical process in emergency medical services, is essential for timely and effective patient care and represents the first step in the emergency care chain. In daily overcrowded combined emergency hospital admissions (CEHA), especially in large hospitals like the Clinical Hospital Center Split, accurate triage ensures patient safety, efficient resource use, and improved outcomes.

A study in December 2024 on 7.630 patients at CEHA KBC Split showed that most patients were in middle and lower triage categories (3, 4, 5), where the largest deviations between actual and recommended waiting times occurred. High-priority patients (1 and 2) were mostly treated on time, although some delays were recorded.

The overall mortality rate was 0.16%, highest in categories 1 and 3. Informed patients reported higher satisfaction and greater trust in care.

Recommendations include improving triage consistency, reducing waiting time deviations, ongoing staff education, and implementing electronic monitoring. These measures can enhance patient safety, efficiency, and care quality and serve as a model for other hospitals in Croatia.

Keywords: emergency medicine; hospital triage; overtriage; outcomes; safety; undertriage; waiting time

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FORGOTTEN CLINICAL SIGNS: A LIFESAVING PARACHUTE IN THE EMERGENCY DEPARTMET

***Tatjana Rajković**[1]

Abstract

In the medical world, with the increasing use of technology and, in recent years, the growing presence of artificial intelligence, the question arises: is it even necessary to examine the patient and integrate classic clinical signs? Will a doctor who combines physical examination and medical literature be one step behind a doctor who bases their opinion solely on diagnostics?

Excessive diagnostics, defensive medicine, and legal pressures have slowly but surely led to delays in the initial patient examination, prolonged waiting times in emergency departments, and even deaths without a diagnosis—often as a result of an insufficient number of doctors and the time spent waiting for diagnostic procedures. The wellknown warning rings true: *If you do not follow protocols and begin treating the patient, be prepared for court.*

At this moment, doctors are more occupied with paperwork, documentation, and leaving a clear trail of their actions, which shortens the time they spend with patients. In the overall overcrowding of the emergency departmet (ED), a particular issue is the practice in which the youngest doctors take the patient's history and perform the examination, then relay their impressions to senior physician, which proceeds to make treatment decisions without ever seeing the patient.

Data show that the average time for taking a history and performing a physical exam is about 10 minutes, and assessments can be even shorter than 10 minutes. Is that enough?

The physical exam is more than a diagnostic tool. It is a discipline of presence, a ritual that builds trust, and a practice that sharpens clinical intuition. A wellperformed examination is not only a means of detecting disease but also a demonstration of clinical mastery and attentiveness to the patient—something no screen can replace. If we continue to devalue it, we risk training a generation of physicians who know disease only through images and numbers, and not through patients themselves. Will patients trust us then?

The aim of this presentation is to remind us of some forgotten clinical signs whose recognition facilitates diagnosis, initial therapy, and the selection of targeted diagnostic methods.

It seems to me that, currently in my country—and likely worldwide—only emergency medicine physicians think in terms of the entire body. Others work thoroughly and expertly within their own organs or systems, and they excel at that, but what happens when a patient has multiple conditions or arrives at the wrong department? Do we recognize what that patient truly needs?

Therefore, clinical signs are a lifesaving parachute for physicians.

Keywords: artificial intelligence; clinical signs; emergency medicine; physical examination

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THE PHYSIOLOGICALLY DIFFICULT AIRWAY IN THE ED. GOING BEYOND ANATOMY.

***Antonios Boultadakis**

Abstract

Airway management is a cornerstone skill in the emergency department (ED), the operation room and the intensive care unit (ICU). Traditional airway management training emphasized anatomical abnormalities and pathologies related to difficult ventilation/intubation (i.e. obesity, facial trauma, reduced cervical spine mobility etc). Unfortunately, this approach of airway management, although plausible in elective surgery settings, cannot ensure adequate patient safety in emergency conditions. Airway management in the ED and ICU involves critically ill patients with compromised pathophysiology and frailty, especially concerning their circulatory, respiratory and neurological status. Ongoing pathologies and deterioration, the overall destabilizing effect of airway management during peri-intubation period and the non-ideal surrounding conditions (space, machinery, patient positioning and pre-intubation preparation) in the ED and ICU, demand different strategies and considerations by the clinicians involved. Immediate airway management in unstable patients may result to adverse events in the peri-intubation period and increased morbidity and mortality. Patient preparation and stabilization before anesthesia induction is crucial and the literature strongly supports a "resuscitate before you intubate" philosophy. This point of view also debates the fundamental ABCDE approach used by clinicians with airway remaining the first to be examined but not necessarily immediately addressed except in specific indications. In this presentation, we will review recent published data in an effort to answer three fundamental questions: 1. When is the ideal time to begin airway management in unstable, physiologically compromised, critically ill patients? 2. What should be addressed before airway management additionally to anatomy? 3. How can the "resuscitate before you intubate" approach be applied in emergency airway management? In addition, we will discuss the clinical indications of immediate airway management and suggest strategies of patient resuscitation and stabilization before airway management, in several common clinical presentations.

Keywords: airway management; resuscitation; critically ill patients

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WEARABLE PHYSIOLOGICAL MONITORING DURING OSCE: ASTROSKIN-DERIVED STRESS MARKERS PREDICT PERFORMANCE IN PARAMEDIC FINAL EXAMS

***Attila Pandur[1], Gabor Priskin[2], Andor Toth[2], Bence Bogár[2], Robert Nikola[2], Daniel Bikki[2]**

Abstract

High-stakes Objective Structured Clinical Examinations (OSCE) in paramedic education recreate the pressure and uncertainty of real prehospital emergencies, where cognitive performance can be impaired by stress. While stress and performance have been traditionally evaluated through subjective or observational means, objective physiological monitoring during summative assessment remains uncommon. This study aimed to determine whether physiological stress markers measured by a wearable smart textile system (Astroskin) are associated with OSCE performance in a paramedic final examination.

Methods

This prospective observational study involved 30 paramedic students during their final state examination. Each participant completed two emergency OSCE stations (adult and paediatric), while wearing smart textile, which continuously recorded heart rate, respiratory rate, and heart rate variability. A composite stress index was calculated by combining HRV and RR as standardised z-scores. OSCE outcomes were dichotomised as pass or fail according to the official assessment rubric.

Results

The overall examination success rate was 60% (18 of 30 students). Students who passed demonstrated significantly higher HRV compared to those who failed (RMSSD 34.8 ± 9.2 ms vs. 19.6 ± 7.4 ms, $p<0.001$; Cohen's $d=1.9$), indicating lower physiological stress reactivity and better autonomic balance. The composite stress index also differed markedly between groups (0.62 ± 0.41 vs. –0.51 ± 0.38, $p<0.001$), while HR showed a supporting trend (104 ± 13 bpm vs. 128 ± 15 bpm, $p=0.008$). Lower parasympathetic withdrawal and a more controlled breathing pattern were strongly associated with successful OSCE performance.

Conclusion

Astroskin-derived physiological stress markers demonstrated a strong association with performance in high-stakes OSCE scenarios. These findings suggest that physiology-informed assessment may offer a novel dimension in competency-based emergency care education. Integrating wearable sensors, personalised biofeedback, and simulation-based training could support stress resilience, optimise cognitive performance under pressure, and enable predictive models for learner assessment. Future research should explore larger cohorts and machine-learning approaches for automated performance prediction.

Keywords: OSCE; emergency; care; simulation

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IMPORTANCE OF EARLY RECOGNITION AND MANAGEMENT OF OPEN PNEUMOTHORAX IN PREHOSPITAL EMERGENCY MEDICAL SERVICES

***Mario Hlavaček[1], Ivana Mikinac[1], Ivon Matić[1]**

Abstract

Open pneumothorax is a life-threatening condition caused by a penetrating chest injury that creates a direct communication between the pleural space and the external environment. This leads to impaired ventilation, lung collapse, and may progress to respiratory failure. In the prehospital setting, early recognition is crucial to prevent clinical deterioration and potentially fatal complications. The importance of early recognition of open pneumothorax and timely initial management in prehospital emergency medical services is based on clinical assessment following the ABCDE trauma approach, including identification of an open chest wound, signs of respiratory distress, and air movement through the wound ("sucking chest wound"). Initial management includes application of an occlusive dressing (three-sided dressing) or a commercial vented chest seal, administration of oxygen, and rapid transport to a hospital for definitive care.

Conclusion

Prompt implementation of simple but effective interventions in the prehospital setting significantly improve outcomes in trauma patients. Continuous education and adherence to standardized protocols are essential for effective management.

Keywords: emergency management; pneumothorax

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THE IMPORTANCE OF EARLY RECOGNITION OF STEMI IN TEAM 2

***Pero Vrebac**[1]

Abstract

Myocardial infarction is an emergency condition that can rapidly lead to cardiac arrest. For this reason, it is extremely important that Team 2 members recognize the symptoms in a timely manner and initiate appropriate patient management. The time of symptom onset and early recognition are key factors that enable faster recovery and reduce the risk of further complications. A specialist paramedic (or emergency medical technician) in Team 2 has a significant responsibility in the early recognition of myocardial infarction symptoms, as well as in the accurate interpretation of the ECG, which represents the primary diagnostic tool, along with a thoroughly obtained medical history. Special attention must be given to differential diagnosis, as the patient's clinical presentation does not always clearly indicate STEMI. Symptoms such as syncope, sudden loss of consciousness, chest pain, increased shortness of breath, cold sweating, shoulder pain, nausea, weakness, and others may lead to an incorrect diagnosis. An important step in patient management is deciding on transport to the nearest facility capable of performing coronary angiography. In many cases, this may prolong transport time due to the organization and distribution of healthcare facilities that provide these procedures. In addition to taking a high-quality medical history and correctly interpreting the ECG, it is necessary to administer appropriate therapy within the scope of acquired competencies. The patient must be under continuous monitoring, including cardiac rhythm monitoring. During transport, the patient's condition is often dynamic, and it is essential to respond appropriately to all potential complications.

Conclusion

Team 2 and specialist paramedics have a significant responsibility to recognize the symptoms of STEMI in a timely manner and not attribute them to other conditions. Only through accurate diagnosis, proper ECG interpretation, and a thorough medical history can myocardial infarction be identified in time and appropriate patient management initiated.

Keywords: ECG; myocardial infarction; STEMI

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PEPTIC ULCER PERFORATION

***Karlo Tkalec[1], Ivona Kranjec[1]**

Abstract

Peptic ulcer perforation (PUP) is a serious cause of acute abdomen, associated with significant morbidity and mortality. This condition most commonly arises as a complication of untreated severe peptic ulcer disease caused by H. Pylori infection, nonsteroidal anti-inflammatory drug (NSAID) use, smoking, or even Zollinger-Ellion Syndrome. Typical presentation includes sudden, severe epigastric pain that rapidly generalizes due to peritoneal contamination. Signs of peritonitis such as guarding, „board-like" rigidity, and rebound tenderness are often present. Early diagnosis is essential and is usually carried out with radiological imaging. Upright chest and abdominal radiographs may reveal free intraperitoneal air, while computed tomography (CT) remains the gold standard due to its high sensitivity and ability to localize the perforation site. Management strategies depend on the patient's clinical stability, comorbidities, and timing of presentation. Initial resuscitation should be done with fluid replacement, broad-spectrum antibiotics, and proton pump inhibitors. Surgical intervention is the treatment of choice and is done with omental patch, however in case of large ulcers resection may be neccessary. In selected stable patients without generalized peritonitis, non-operative management may be considered under close monitoring. It is important to note that late diagnosis and delayed treatment significantly worsen outcomes. Mortality rates remain high, as much as 10 %, particularly in elderly patients and those with comorbid conditions.

Conclusion

Peptic ulcer perforation is a surgical emergency requiring prompt recognition and intervention. Early diagnosis, appropriate imaging, and timely management are crucial in reducing morbidity and mortality. Continued awareness and optimization of treatment protocols are essential, especially in high-risk populations.

Keywords: acute abdomen; peptic ulcer; perforation

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AUTOIMMUNE MYOCARDITIS IN A PATIENT WITH POLYMYOSITIS AND INFLUENZA INFECTION – A CASE REPORT

***Nikolina Božić[1], Marissa Bura[1], Mirna Habjanović[2], Vedrana Baraban[2,3,4]**

Introduction

Autoimmune myocarditis is the inflammation of the heart muscle which can be triggered by various etiologies such as viral infection, systemic or local autoimmune diseases, exposure to cryptic antigens, and mimicry. Early recognition of myocarditis is important because it can cause malignant heart rhythms, cardiomyopathy, and heart failure.

Case presentation: A 70-year-old male with a medical history of polymyositis was admitted due to chest pain radiating to the back, weakness and loss of appetite. On physical examination, patient was hemodynamically stable but appeared seriously ill. His electrocardiogram showed no pathological rhythm and ST changes, but troponins were above reference values. Laboratory tests revealed leukocytosis, erythrocytosis, elevated C-reactive protein, high levels of myoglobin and creatine kinase. Computed tomography angiography of the aorta was normal, ruling out aortic dissection. Due to the elevated troponin levels, the patient was admitted to the coronary disease department for further evaluation. Coronary angiography showed normal coronary artery anatomy, without arterial narrowing that would indicate myocardial infarction. Other radiological imaging including chest X-ray showed normal results. A transthoracic echocardiogram showed minor degenerative changes that were not clinically significant. During hospitalization, the patient tested negative for SARS-CoV-2, but the rapid antigen test for influenza returned a positive result. Considering the patient's medical history, laboratory, and imaging findings, he was diagnosed with autoimmune myocarditis triggered by influenza virus infection. At the discharge, laboratory findings were normal, and the patient's general clinical condition was good.

Conclusion

The case presents a rare diagnosis of autoimmune myocarditis which was triggered by the influenza virus in a patient with a previous history of polymyositis. Sometimes, serious clinical conditions can be caused by infections that trigger inflammatory or autoimmune responses.

Keywords: myocarditis; orthomyxoviridae; polymyositis

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BEYOND BACK PAIN: PROCALCITONIN AS A BIOMARKER IN EMERGENCY CARE OF INFECTIOUS SPONDYLODISCITIS

[1]Neada Hoxha

Abstract

Infectious spondylodiscitis is a rare but serious condition, often presenting with severe spinal pain in the emergency department. Early diagnosis is challenging due to nonspecific clinical features. Procalcitonin (PCT) a biomarker of bacterial infection,may provide valuable support in differentiating infectious causes of spinal pain from non-infectious etiologies.

Methods

This review synthesizes evidence from the past decade, analyzing the role of procalcitonin in the diagnostic process of infectious spondylodiscitis. Literature was retrieved from PubMed, Scopus, and Cochrane databases focusing on studies evaluating PCT levels in spinal infections and their utility in emergency settings.

Results

Elevated procalcitonin levels are associated with systemic bacterial infections and may serve as an indicator of infectious spondylodiscitis. However,sensitivity is limited in localized infections without sepsis. Combining PCT with other (C-reactive protein, CRP, erythrocyte sedimentation rate, ESR) and imaging (MRI) improves diagnostic accuracy. Discussion In emergency care, procalcitonin can act as a rapid adjunctive tool, guiding clinicians in distinguishing infectious spinal pain from non-infectious causes. Nevertheless, its interpretation must be contextual,and it cannot replace imaging or microbiological cultures.

Conclusion

Procalcitonin plays an important role as a supportive biomarker in the emergency diagnosis of infectious spondylodiscitis. Its use integrated with clinical assessment, laboratory markers and radiological findings, enhances diagnostic confidence and facilitates timely management.

Keywords: infectious spondylodiscitis; emergency diagnosis; procalcitonin

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PAIN CONTROL IN INFECTIOUS SPONDYLODISCITIS: EMERGENCY PERSPECTIVES

Neada Hoxha[1], Ermira Muco[2]

Abstract

Infectious spondylodiscitis is a rare but clinically significant condition, often presenting with acute spinal pain resistant to conventional analgesics. In the emergency setting, early recognition is challenging due to nonspecific symptoms, yet crucial for prognosis and prevention of neurological complications.

Methods

This review synthesizes evidence from clinical literature addressing pain management strategies in infectious spondylodiscitis with emphasis on emergency care, diagnostic pathways and multimodal therapeutic approaches.

Results

NSAIDs and paracetamol are effective in moderate pain but frequently insufficient in severe cases. Opioids are required for acute pain control, though their use demands caution regarding adverse effects and dependency risk. Multimodal strategies combining analgesics, muscle relaxants, nerve blocks and spinal immobilization provide enhanced symptom relief. MRI remains the most sensitive diagnostic modality, while inflammatory markers (C-reactive protein (CRP), erythrocyte sedimentation rate (ESR)) support early orientation. Effective management requires multidisciplinary collaboration among emergency physicians, infectious disease specialists, orthopedists and radiologists.

Conclusion

Pain management in infectious spondylodiscitis must be integrated with early diagnosis and prompt initiation of antimicrobial therapy. Spinal immobilization offers symptomatic benefit and structural protection, while multidisciplinary approaches are essential to optimize pain control, infection treatment and patient outcomes.

Keywords: emergency management; infectious spondylodiscitis

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PATIENT SAFETY IN THE EMERGENCY DEPARTMENT – PREVENTING ERRORS IN A HIGH-STRESS ENVIRONMENT

Nikolina Žužul[1], Melina Nelyh Đikoli[1], Matea Maksimović[1], Marija Mahovlić[1], Blanka Perenc[1]

Abstract

The emergency department is a high-risk and dynamic clinical environment in which patients of varying degrees of urgency are treated simultaneously, often with limited information and significant time pressure. Such conditions increase the likelihood of adverse events, particularly in the areas of triage, diagnostic processes, medication administration, and information transfer.

The most common errors include inadequate triage, delay in recognizing clinical deterioration, medication errors (inappropriate dose, drug, or route of administration), patient misidentification, and communication failures during the handover of care. Additional risk factors include crowding, shift work, fatigue, and cognitive overload, which can lead to burnout.

Error prevention requires a systematic approach focused on standardizing procedures and strengthening a safety culture. The use of validated triage systems, guidelines and algorithms, early warning scoring systems (EWS), and protocols for the safe use of high-risk medications reduces variability and increases the reliability of care. Consistent verification of patient identity and the use of checklists further reduce the risk of adverse events.

Structured communication, for example through the application of the SBAR model, is essential during the transfer of care and teamwork in acute situations. Regular analyses of adverse events, simulation training of crisis scenarios and continuous education of staff contribute to organizational learning and system resilience.

Conclusion

In conclusion, patient safety in the emergency department depends on the integration of clinical competence, effective communication tools and organizational support. Systematic risk identification, optimization of work processes and promotion of a safety culture are the basis for reducing errors and improving treatment outcomes in the highly stressful environment of emergency medicine.

Keywords: algorithms and guidelines, patient safety, communication skills, emergency medicine

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CASE REPORT: PAPILLARY MUSCLE RUPTURE – IMPORTANCE OF ULTRASOUND IN EMERGENCY MEDICINE, EARLY DETECTION OF ACUTE MI COMPLICATIONS AND TIMELY INTERVENTION

*** Lana Đurić[1], Maja Materljan[2,3], Filip Diklić Perin[4], Željka Rubeša Miculinić[4]**

Introduction

Acute myocardial infarction (AMI) represents one of the most common and life-threatening cardiovascular conditions, making early recognition of its acute complications crucial for reducing mortality. Mechanical complications, such as papillary muscle rupture, are now less frequent due to earlier diagnosis and recognition, but still represent a life-threatening condition that requires urgent medical intervention.

Case presentation

A 64-year-old male was brought to the emergency department (ED) due to recurrent pain in the left side of the neck and left shoulder, which had occurred at rest and spontaneously resolved over the past week. On the day of admission, the pain recurred, starting in the early morning, this time accompanied by lightheadedness and collapse. He was brought in under a prior suspicion of ST-segment elevation myocardial infarction (STEMI).

On admission he was hypotensive, tachycardic, pale, and cold-sweaty, with dyspnea, consistent with cardiogenic shock. Auscultation revealed a rhythmic heart action with clear heart sounds and a noticeable systolic murmur. Electrocardiography showed sinus tachycardia with ST-segment elevations in II, III, and aVF, and ST-segment depressions in V1–V3, consistent with an inferoposterior STEMI. Non-invasive ventilation, invasive hemodynamic monitoring and appropriate therapy was initiated. Lung ultrasound demonstrated bilateral B-lines indicating interstitial edema and pulmonary congestion. Point-of- care echocardiography raised suspition of severe primary mitral regurgitation and performed urgent transesophageal echocardiography confirmed diagnosis. Following completion of the evaluation, the diagnosis of inferoposterior STEMI complicated by cardiogenic shock due to acute severe mitral regurgitation from papillary muscle rupture was established. The patient was referred to the catheterization laboratory and subsequently underwent cardiac surgery.

Conclusion

This case demonstrates how clinical suspicion combined with proficiency in the use of ultrasound, enables early diagnosis, timely intervention and initiation of appropriate therapy that significantly impact patient survival.

Key words: Acute myocardial infarction, systolic murmur, transesophageal echocardiography, papillary muscle

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All animal experiments should comply with the ARRIVE guidelines and should be carried out in accordance with the U.K. Animals (Scientific Procedures) Act, of 1986 and associated guidelines, EU Directive 2010/63/ EU for animal experiments, or the National Research Council's Guide for the Care and Use of Laboratory Animals and the authors should clearly indicate in the manuscript that such guidelines have been followed. The sex of animals must be indicated, and where appropriate, the influence (or association) of sex on the results of the study.

Preparation of manuscript

Manuscripts must be prepared using Microsoft Office Word as a Word file (doc or docx). Use 1.5 line spacing throughout, including the title page, abstract, text, acknowledgments, references, individual tables, and legends with a 2 cm margin on all sides of the text. The text should be Times New Roman font size 12 (except if required within tables where size 10 may be used). The text of the manuscript should be divided into sections: Title page, Abstract and Key words, Introduction, Methods, Results, Discussion, Acknowledgment, References, Tables, Legends and Figures. For a brief report include Abstract, Key-words, Introduction, Case report, Discussion, Reference, Tables and Legends in that order. The review article should have an unstructured Abstract representing an accurate summary of the article. The section titles would depend upon the topic reviewed.

Pages must be numbered.

1. Title Page

The title page must designate a corresponding author and provide a complete address, telephone number, e-mail address and ORCID ID. Affiliations are required for each author. (Include institution, city and state.)

Corresponding Author: Authors must indicate who will handle correspondence at all stages of refereeing, publication and post-publication. Ensure that the Corresponding Author title(s) and credentials, degree(s) (e.g., MD, Ph.D), affiliation(s) and postal and email addresses are given and that contact details are kept up to date by the Corresponding Author

2. Abstract and Keywords

The second page should carry an abstract (summary) both in English and Croatian (of no more than 200 words each). The abstract should be informative and self-explanatory without reference to the text of the manuscript. Authors are advised not to use abbreviations and references in the abstract. The abstract should contain between 100-250 words.

It should be organized into sections using the following headings: BACKGROUND or OBJECTIVE; PATIENTS/MATERIALS/SUBJECTS AND METHODS or CASE REPORT/PRESENTATION (in case reports); RESULTS; CONCLUSIONS. A structured abstract is not required for narrative literature reviews.

Below the abstract, the authors should provide up to maximum of 5 key words or short phrases that will assist indexers in cross-indexing the article and may be published with the abstract. Terms from the Medical Subject Headings (MeSH) list of Index Medicus should be used for keywords.

3. Introduction

The Introduction should introduce the background subject of the study to the reader in clear language with supporting evidence. It is important to specify if the observation could be based on previous research by others or your own pilot study and must include a summary of findings from previous, relevant studies.

4. Methods

Methods have to provide sufficient details to allow the work to be reproduced by an independent researcher and must include a statement regarding approval from the Institutional Review Board.

Papers dealing with experiments on human subjects should clearly indicate that the procedures followed were in accordance with the ethical standards of the institutional or regional responsible committee on human experimentation. Never use patients' names, initials, or hospital numbers, especially in illustrative material. Papers dealing with experiments on animals should indicate that the institution's or a national research council's guide for the care and use of laboratory animals was followed.

5. Results

Results should be clear and concise, and presented in a logical order. Repetition of the same information in text as well as tables and figures must be avoided. Figures should have clear legends and titlles.

Tables

Tables must be submitted as editable text, not as images. Some guidelines:

- Place tables next to the relevant text or on a separate page(s) at the end of your article.
- Cite all tables in the manuscript text.
- Number tables consecutively according to their appearance in the text.
- Please provide captions along with the tables.
- Place any table notes below the table
- Avoid vertical rules and shading within table cells.

We recommend that you use tables sparingly, ensuring that any data presented in tables is not duplicating results described elsewhere in the article.

Figures, images and artwork

Figures, images, artwork, diagrams and other graphical media must be supplied as separate files along with the manuscript.

When submitting artwork:

- Cite all images in the manuscript text.
- Number images according to the sequence they appear within your article.
- Submit each image as a separate file using a logical naming convention for your files (for example, Figure_1, Figure_2 etc).
- Please provide captions along with the artwork.

6. Discussion

Disscusion should not just repeat the results, but compare the current findings with the existing literature.

7. Conclusions

Conclusions should be derived from the findings of the study and not overarching ones. The main conclusions of the study should be presented in a short Conclusions section, which may stand alone.

8. References

References should be cited using Arabic numerals in parentheses in the order they are first mentioned in the text. For example, if a study is referenced for the first time, it should appear as (1). Subsequent citations should continue numerically (e.g., (2), (3), etc.). Each reference must include the DOI number, which provides a persistent link to the source. References should adhere to the NLM (National Library of Medicine) standards as outlined by the International Committee of Medical Journal Editors

(ICMJE) (https://www.nlm.nih.gov/bsd/uniform_requirements.html) Consult Index Medicus or PubMed (http://www.ncbi.nlm.nih.gov/entrez/) for standard journal abbreviations.

9. Highlights

Highlights are mandatory for this journal as they help increase the discoverability of your article via search engines. They consist of a short collection of bullet points that capture the novel results of your research as well as new methods that were used during the study Highlights should be submitted in a separate editable file in the online submission system. Please use 'Highlights' in the file name and include 3 to 5 bullet points (maximum 85 characters, including spaces, per bullet point)

10. Abbreviations

Use only standard abbreviations. The full term for which an abbreviation stands should precede its first use in the text unless it is a standard unit of measurement.

Indexing

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EMPRESSIN®

ARGIPRESINACETAT

- **Aktivacija V1**[1,2]
- **Noradrenalin-štedeći učinak**[1,3,4]
- **10-20 minuta efektivno vrijeme poluživota**[5,6]
- **Nadomjestak relativne deficijencije vazopresina**[4]

Niži rizik od fibrilacije atrija[7]

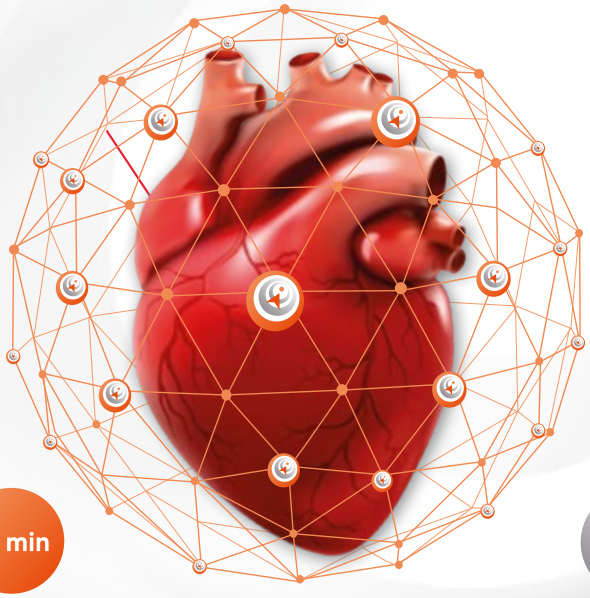
Manje vazokonstrikcije u plućima[8,9,10]

Manja potreba za bubrežnom nadomjesnom terapijom[11]

SSC

Brza kontrola ventrikularne frekvencije u bolesnika sa SVT i AF[12]
Prva linija za bolesnike sa srčanom disfunkcijom[13]

- **Ograničen utjecaj** na krvni tlak i kontraktilnost miokarda[14]
- **Povoljan sigurnosni profil za pacijente s jetrenim i bubrežnim komorbiditetima** – inaktivni metaboliti i metabolizam putem esteraza u plazmi[12,15]
- **Kompatibilnost s plućnim bolesnicima** zbog vrlo visoke kardioselektivnosti u odnosu na druge ß1 blokatore (β1/β2 selektivnost = 255:1)[16]



ESC / EHRA

1 min Nastup djelovanja[17]

4 min Vrijeme poluživota[17]

15 min Dugotrajnost učinka[17]

Rapibloc®
Landiololklorid

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AOP HEALTH

CRO/IC-1/03-26 • DATUM SASTAVLJANJA MATERIJALA: OŽUJAK 2026.

PROVIDENS

EMPRESSIN – SKRAĆENI SAŽETAK OPISA SVOJSTAVA LIJEKA

NAZIV LIJEKA: Empressin 40 IU/2 ml koncentrat za otopinu za infuziju (argipresinacetat). **TERAPIJSKE INDIKACIJE:** Empressin je indiciran za liječenje hipotenzije refraktorne na primjenu katekolamina nakon septičkog šoka u bolesnika starijih od 18 godina. Hipotenzija refraktorna na primjenu katekolamina prisutna je ako se srednji arterijski krvni tlak ne može stabilizirati do ciljane vrijednosti unatoč odgovarajućoj nadoknadi volumena i primjeni katekolamina. **DOZIRANJE I NAČIN PRIMJENE:** Terapiju argipresinom u bolesnika s hipotenzijom refraktornom na primjenu katekolamina poželjno je započeti u prvih šest sati od pojave septičkog šoka ili unutar 3 sata od njegove pojave u bolesnika na visokim dozama katekolamina. Argipresin se mora primjenjivati u obliku kontinuirane intravenske infuzije od 0,01 IU u minuti pomoću perfuzora (infuzijske pumpe sa štrcaljkom). Ovisno o kliničkom odgovoru, doza se može povisiti svakih 15 – 20 minuta do 0,03 IU u minuti. Za bolesnike u jedinici intenzivne skrbi normalan ciljani krvni tlak je 65 – 75 mmHg. Argipresin se smije koristi isključivo uz konvencionalnu vazopresornu terapiju katekolaminima. Doze više od 0,03 IU u minuti smiju se primijeniti samo kao hitno liječenje, jer mogu uzrokovati nekrozu crijeva i kože te povećati rizik od srčanog zastoja. Trajanje liječenja mora se odrediti prema pojedinačnoj kliničkoj slici, ali je poželjno da ne bude kraće od 48 sati. Liječenje argipresinom ne smije se naglo prekinuti, ali ga treba smanjivati u skladu s kliničkim tijekom u bolesnika. O cjelokupnom trajanju liječenja argipresinom treba odlučiti nadležni liječnik.

Doziranje: Brzina infuzije prema preporučenim dozama:

Doza lijeka Empressin/min	Doza lijeka Empressin/sat	Brzina infuzije
0,01 IU	0,6 IU	0,75 ml/sat
0,02 IU	1,2 IU	1,50 ml/sat
0,03 IU	1,8 IU	2,25 ml/sat

Pedijatrijska populacija: Argipresin je korišten za liječenje vazodilatacijskog (distribucijskog) šoka u djece i novorođenčadi u jedinicama intenzivne skrbi i tijekom operacije. Budući da primjena argipresina u usporedbi sa standardnim liječenjem nije rezultirala poboljšanjem preživljavanja te da je pokazala veće stope štetnih događaja, ne preporuča se uporaba u djece i novorođenčadi. **KONTRAINDIKACIJE:** Preosjetljivost na djelatnu tvar ili neku od pomoćnih tvari. **POSEBNA UPOZORENJA I MJERE OPREZA PRI UPORABI:** Ovaj lijek se ne smije koristiti naizmjenično s drugim lijekovima koji sadrže argipresin kod kojih se jačina izražava na različiti način (primjerice, u jedinicama presora, *engl. Pressor Units, P.U.*). Argipresin se ne smije davati kao bolus za terapiju šoka refraktornog na primjenu katekolamina. Argipresin se smije primjenjivati samo uz pozorno i kontinuirano praćenje hemodinamičkih parametara i parametara specifičnih za organe.Terapiju argipresinom treba započeti samo ako se ne može održati dovoljan perfuzijski tlak unatoč odgovarajućoj nadoknadi volumena i primjeni katekolaminergičkih vazopresora. Argipresin treba koristiti s posebnom pozornošću u bolesnika sa srčanim ili krvožilnim bolestima. Primjena visokih doza argipresina za ostale indikacije pokazala je da uzrokuje ishemiju miokarda i crijeva, srčani udar i infarkt crijeva te smanjenu perfuziju (prokrvljenost) ekstremiteta. Argipresin može u rijetkim slučajevima izazvati intoksikaciju vodom. Rani znakovi omamljenosti, bezvoljnosti i glavobolje moraju se pravodobno prepoznati kako bi se spriječili završni stadij kome i konvulzije. Argipresin se mora primjenjivati s oprezom kod epilepsije, migrene, astme, zatajenja srca ili bilo kojeg stanja u kojem brzo povećanje izvanstanične (ekstracelularne) tekućine može izazvati opasnost za već preopterećeni sustav. U pedijatrijskoj populaciji nije pokazan pozitivan omjer koristi i rizika lijeka. Ne preporuča se uporaba argipresina u ovoj indikaciji u djece i novorođenčadi. Ovaj lijek sadrži manje od 1 mmol (23 mg) natrija po ml, tj. zanemarive količine natrija. **UČESTALE NUSPOJAVE:** Najčešće ozbiljne nuspojave (učestalost ispod 10 %) su: životno ugrožavajuća aritmija, mezenterična ishemija, digitalna ishemija i akutna ishemija miokarda. Ostale česte nuspojave su angina pektoris, periferna vazokonstrikcija, nekroza, perioralno bljedilo, grčevi u abdomenu, ishemija crijeva, nekroza kože, digitalna ishemija. **NOSITELJ ODOBRENJA ZA STAVLJANJE LIJEKA U PROMET:** Orpha-Devel Handels und Vertriebs GmbH, Wintergasse 85/1B, 3002 Purkersdorf, Austrija. **BROJ ODOBRENJA ZA STAVLJANJE LIJEKA U PROMET:** HR-H-796202242. **DATUM REVIZIJE TEKSTA:** 23.11.2023. **NAČIN IZDAVANJA LIJEKA:** Lijek se izdaje na recept, u ljekarni.

DATUM SASTAVLJANJA MATERIJALA: ožujak 2026.

CRO/EMPR-1/03-26

RAPIBLOC – SKRAĆENI SAŽETAK OPISA SVOJSTAVA LIJEKA

NAZIV LIJEKA: Rapibloc 300 mg prašak za otopinu za infuziju (landiololklorid). **TERAPIJSKE INDIKACIJE:** Supraventrikularna tahikardija i brza kontrola frekvencije ventrikula u bolesnika s fibrilacijom ili undulacijom atrija u perioperacijskim, poslijeoperacijskim ili drugim okolnostima kad je poželjna kratkotrajna kontrola frekvencije ventrikula kratkodjelujućim lijekom. Nekompenzirana sinusna tahikardija kad je, prema prosudbi liječnika, potrebno specifično liječenje ubrzanog rada srca. **DOZIRANJE:** Landiolol je namijenjen intravenskoj primjeni u bolničkim uvjetima. Samo odgovarajuće osposobljeni zdravstveni stručnjaci smiju primjenjivati landiolol. Dozu landiolola treba individualno prilagoditi. Infuzija se obično započinje brzinom od 10 – 40 mikrograma po kg tjelesne težine u minuti, pri kojoj usporavanje srčane frekvencije nastupa unutar 10 –20 minuta. Ako je poželjno brzo usporavanje srčane frekvencije (unutar 2 do 4 minute), može se razmotriti udarna doza od 100 mikrogram/kg/min tijekom 1 minute, nakon koje slijedi kontinuirana intravenska infuzija od 10 – 40 mikrogram/kg/min. U bolesnika sa srčanom disfunkcijom i septičkim šokom moraju se primijeniti manje početne doze. ***Maksimalna doza:*** Doza održavanja smije se povećati do 80 mikrogram/kg/min tijekom kraćeg vremenskog razdoblja, ako kardiovaskularni status bolesnika zahtijeva i dopušta takvo povećanje doze te ako nije prekoračena maksimalna dnevna doza. Maksimalna preporučena dnevna doza landiololklorida je 57,6 mg/kg/dan (npr. 40 mikrogram/kg/min tijekom 24 sata). Iskustva s primjenom infuzije landiolola dužom od 24 sata za doze > 10 µg/kg/min su ograničena. U slučaju nuspojave, dozu landiolola treba smanjiti ili privremeno prekinuti infuziju, a bolesnike po potrebi odgovarajuće liječiti. U slučaju hipotenzije ili bradikardije, s primjenom landiolola smije se ponovo početi u manjoj dozi nakon što se krvni tlak ili srčana frekvencija vrate na prihvatljive vrijednosti. U bolesnika s niskim sistoličkim krvnim tlakom potreban je izniman oprez pri prilagodbi doze i tijekom infuzije održavanja. Posebne populacije: Starije osobe (≥ 65 godina): Nije potrebna prilagodba doze; Oštećenje funkcije bubrega: Nije potrebna prilagodba doze; Oštećenje funkcije jetre: Podaci o primjeni u bolesnika s oštećenjem funkcije jetre su ograničeni. U bolesnika sa svim stupnjevima oštećenja funkcije jetre preporučuje se pažljivo doziranje s najnižom početnom dozom; Srčana disfunkcija: U bolesnika s poremećajem funkcije lijeve klijetke (LVEF < 40 %, CI < 2,5 l/min/m2, NYHA 3-4) npr. nakon kirurškog zahvata na srcu, tijekom ishemije ili septičkih stanja, korištene su manje doze počevši od 1 mikrogram/kg/min i povećavane su u koracima uz pomno praćenje krvnog tlaka do 10 mikrogram/kg/min za postizanje kontrole srčane frekvencije. Ako je potrebno i ako bolesnik to može podnijeti s obzirom na kardiovaskularni status, mogu se razmotriti daljnja povećanja doze uz pomno hemodinamsko praćenje; Septički šok: U bolesnika sa septičkim šokom korištene su manje doze počevši od 1 mikrogram/kg/min do najviše 40 mikrogram/kg/min za postizanje kontrole srčane frekvencije. Doza je povećavana u koracima po 1 mikrogram/kg/min s najmanjim intervalom doziranja od 20 minuta uz pomno praćenje krvnog tlaka; Pedijatrijska populacija: Sigurnost i djelotvornost landiolola u djece u dobi od 0 do 18 godina nisu još ustanovljene. **NAČIN PRIMJENE:** Rapibloc se prije primjene mora rekonstituirati i upotrijebiti neposredno po otvaranju. Landiolol se mora primijeniti intravenski kroz centralni ili periferni venski kateter i ne smije se primjenjivati kroz isti intravenski kateter kroz koji se primjenjuju drugi lijekovi. **KONTRAINDIKACIJE:** Preosjetljivost na djelatnu tvar ili neku od pomoćnih tvari, teška bradikardija (manje od 50 otkucaja u minuti), sindrom bolesnog sinusnog čvora, teški poremećaj provođenja kroz AV čvor (bez elektrostimulatora srca): AV blok 2. ili 3. stupnja, kardiogeni šok, teška hipotenzija, dekompenzirano zatajenje srca kada se smatra da nije povezano s aritmijom, plućna hipertenzija, neliječeni feokromocitom, akutni astmatski napad, teška, refraktorna metabolička acidoza. **POSEBNA UPOZORENJA I MJERE OPREZA:** Rapibloc se prije primjene mora rekonstituirati i upotrijebiti neposredno po otvaranju. Savjetuje se neprekidno pratiti krvni tlak i EKG u svih bolesnika koji se liječe landiololom. Preeksicitacijski sindrom: Beta blokatore treba izbjegavati u bolesnika s preeksicitacijskim sindromom u kombinaciji s fibrilacijom atrija. U ovih bolesnika beta-blokada atrioventrikularnog čvora može povećati provodljivost kroz akcesorni put i dovesti do ventrikularne fibrilacije. AV blok I. stupnja: Zbog negativnog učinka na trajanje atrioventrikularnog provođenja, u bolesnika s AV blokom I. stupnja beta blokatore treba davati uz oprez. Prinzmetalova angina: Beta blokatori mogu povećati broj i trajanje anginoznih napada u bolesnika s Prinzmetalovom anginom (vazospastična angina), zbog neometane vazokonstrikcije koronarnih arterija posredovane alfa receptorima. Neselektivni beta blokatori ne smiju se primjenjivati u ovih bolesnika, dok se beta-1 selektivni blokatori smiju primjenjivati samo uz krajnji oprez. Zatajenje srca i hemodinamski ugroženi bolesnici: Primjenu landiolola radi kontrole ventrikularnog odgovora u bolesnika sa supraventrikularnim aritmijama treba provoditi s oprezom u bolesnika s (postojećim) zatajenjem srca ili kad je bolesnik hemodinamski ugrožen ili uzima druge lijekove koji smanjuju jedan od navedenih ili sve parametre: periferni otpor, punjenje srca, kontraktilnost miokarda ili širenje električnih impulsa kroz miokard. Potrebno je odvagnuti koristi od moguće kontrole frekvencije u odnosu na rizik od daljnje depresije kontraktilnosti miokarda. Kod prvog znaka ili simptoma daljnjeg pogoršanja doza se ne smije povećavati te se, ako se smatra potrebnim, primjenu landiolola treba prekinuti i bolesnika odgovarajuće liječiti. Istodobna primjena: Istodobna primjena landiolola s verapamilom ili diltiazemom ne preporučuje se u bolesnika s poremećajem atrioventrikularne provodljivosti. Bolesnici sa šećernom bolešću: Landiolol treba primjenjivati uz oprez u bolesnika sa šećernom bolešću ili u slučaju hipoglikemije. Oštećenje funkcije bubrega: Vodeći metabolit landiolola (M1) izlučuje se putem bubrega i u bolesnika s oštećenjem funkcije bubrega postoji sklonost nakupljanju, pa iako nema aktivnost beta blokatora, čak ni u dozi 200 puta većoj od one ishodišnog lijeka, landiolol treba primjenjivati uz oprez u bolesnika s oštećenom funkcijom bubrega. Feokromocitom: U bolesnika s feokromocitomom landiolol treba primjenjivati uz oprez i samo nakon prethodnog liječenja blokatorima alfa receptora. Bronhoopstruktivna bolest: Zbog svoje visoke selektivnosti za beta-1 receptore i mogućnosti titrabcije, landiolol se može primjenjivati u bolesnika s bronhoopstrukcijom uz oprez. Landiolol treba pažljivo titrirati kako bi se primijenila najniža moguća djelotvorna doza. U slučaju bronhospazma, infuziju landiolola treba odmah prekinuti i po potrebi primijeniti beta-2 agonist. Bolesti periferne cirkulacije: U bolesnika s poremećajima periferne cirkulacije (Raynaudova bolest ili sindrom, intermitentne klaudikacije) beta blokatore treba primjenjivati s velikim oprezom jer može doći do pogoršanja tih poremećaja. Beta blokatori mogu povećati osjetljivost na alergene i ozbiljnost anafilaktičkih reakcija. U bolesnika koji uzimaju beta blokatore može izostati odgovor na doze adrenalina koje se uobičajeno primjenjuju za liječenje anafilaktičkih reakcija. **UČESTALE NUSPOJAVE:** Najčešće zabilježene nuspojave landiolola su hipotenzija i bradikardija te pad krvnog tlaka. **NOSITELJ ODOBRENJA ZA STAVLJANJE LIJEKA U PROMET:** Amomed Pharma GmbH, Leopold-Ungar-Platz 2, 1190 Beč, Austrija. **BROJ ODOBRENJA ZA STAVLJANJE LIJEKA U PROMET:** HR-H-922016446. **DATUM REVIZIJE TEKSTA:** 27.02.2026. **NAČIN IZDAVANJA LIJEKA:** Lijek se izdaje na recept, u ljekarni.

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