REVIEW ARTICLE / PREGLEDNI ČLANAK

CHEMSEX-RELATED VISITS TO EMERGENCY DEPARTMENTS: A NARRATIVE REVIEW

POSJETI BOLNIČKOM PRIJAMU VEZANI UZ *"CHEMSEX"*: PREGLEDNI RAD

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Abstract

Chemsex refers to the deliberate use of psychoactive substances to shape sexual experience by intensifying arousal, extending endurance, reducing inhibition, and facilitating interpersonal connection. In recent years, this practice has emerged as a significant contributor to acute intoxication presentations in emergency departments (EDs), particularly within large European urban centres. These presentations are characterised by intentional polydrug exposure, narrow safety margins, and overlapping toxidromes that challenge conventional single-substance ED protocols. This narrative review synthesises current evidence on epidemiology, substance-specific motivations, and ED-relevant clinical manifestations, with a focus on synthetic cathinones, methamphetamine, gamma-hydroxybutyrate/gamma-butyrolactone (GHB/GBL), ketamine, 3,4 methylenedioxymethamphetamine (MDMA), cocaine, alkyl nitrites, phosphodiesterase type 5 inhibitors, cannabis, and novel psychoactive substances. By mapping desired psychosexual effects to pharmacological mechanisms and acute risks, we outline practical ED management priorities, opportunities for harm-reduction integration, and implementation pathways. The aim is to translate lived chemsex practices into actionable emergency care strategies that reduce morbidity and strengthen linkage to ongoing support services. Chemsex-related presentations require recognition of characteristic polydrug toxidromes and coordinated emergency care that integrates acute management with harm-reduction and referral pathways.

Key words: acute intoxication; chemsex; emergency department; harm reduction; polydrug use; synthetic cathinones.

Sažetak

„*Chemsex*" označava namjernu uporabu psihoaktivnih tvari radi oblikovanja seksualnog iskustva, pojačavanja uzbuđenja, produljenja izdržljivosti, smanjenja inhibicija i olakšavanja seksualne povezanosti. U posljednjih nekoliko godina ta je praksa postala značajan uzrok akutnih intoksikacija koje dovode bolesnike u hitne bolničke prijeme, osobito u velikim europskim gradovima. Prezentacije povezane s *chemsexom* često uključuju istodobnu uporabu više supstanci, imaju uske sigurnosne margine i stvaraju preklapajuće toksidrome, što predstavlja izazov za standardne protokole Objedinjenog hitnog bolničkog prijama (OHBP) usmjerene na pojedinačne droge.

Ovaj pregledni rad sažima dostupne dokaze o epidemiologiji, motivacijama za uporabu pojedinih supstanci i kliničkim manifestacijama relevantnima za hitnu medicinu. Posebna pozornost posvećena je sintetskim katinonima, metamfetaminu, GHB/GBLu, ketaminu, MDMAi, kokainu, alkilnitritima, inhibitorima fosfodiesteraze tipa 5, kanabisu i novim psihoaktivnim tvarima. Povezujući željene psihoseksualne učinke s farmakološkim mehanizmima i akutnim rizicima, iznosimo praktične prioritete za zbrinjavanje u OHBPu, mogućnosti integracije mjera smanjenja štete te smjernice za njihovu provedbu.

Cilj rada je kliničke slučajeve „*chemsexa*" prevesti u primjenjive strategije hitne medicinske skrbi koje smanjuju morbiditet i poboljšavaju povezivanje pacijenata s dugoročnim oblicima

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podrške. Kliničke prezentacije povezane sa *Chemsex*-om zahtijevaju prepoznavanje karakterističnih toksidroma povezanih sa unosom više vrsta droga te koordinirano hitno zbrinjavanje koje integrira akutno liječenje s mjerama smanjenja štete i odgovarajućim upućivanjem na daljnju skrb.

Ključne riječi: akutna intoksikacija, *chemsex;* hitni bolnički prijam; smanjenje štete; uporaba više droga; sintetski katinoni.

Introduction

Chemsex encompasses a heterogeneous but increasingly prevalent set of sexualised drug-use practices in which individuals intentionally combine stimulants, empathogens, dissociatives, depressants, and adjunctive agents to modulate desire, stamina, intimacy, and performance during prolonged sexual encounters. Across European emergency departments, clinicians report a growing share of acute intoxication presentations linked to these practices, with substantial regional variation driven by local drug markets, social networks, and access to sexual health and addiction services. In high-prevalence settings such as Barcelona, chemsex-related intoxications have come to represent a majority of adult toxicology presentations over a short period, underscoring the pace of change in ED burden (1).

> Chemsex-related intoxications represent a growing burden for emergency departments in European urban centres.

Patients presenting with *chemsex*-related toxicity are most commonly young to middle-aged men, with men who have sex with men (MSM) representing the majority of reported cases. Compared with other intoxication populations, these individuals frequently exhibit higher rates of human immunodeficiency virus (HIV) infection and co-occurring psychiatric conditions, including anxiety, depression, and bipolar disorder (2-4).

These intersecting vulnerabilities are associated with greater clinical acuity, recurrent ED utilisation, and more complex disposition planning. A defining challenge for emergency care is the intentional use of multiple substances to achieve specific experiential trajectories. While this approach allows users to fine-tune arousal, emotional connection, and endurance, it simultaneously compresses therapeutic windows. It produces mixed toxidromes that are difficult to manage using traditional single-substance frameworks (3-6).

Methods

This manuscript adopts a narrative review approach to integrate published evidence on emergency department presentations associated with chemsex. Emphasis is placed on substance-specific motivations, acute clinical manifestations, ED management priorities, and harm-reduction and implementation strategies relevant to emergency care. The objective is interpretive synthesis rather than quantitative pooling, reflecting the heterogeneity of study designs, populations, and outcome measures in the available literature.

Relevant studies were identified through structured searches of PubMed, Embase, Scopus, and Web of Science for publications between 2010 and 2025. Search strategies combined terms related to chemsex or sexualised drug use with emergency care, acute toxicity, and specific substances (e.g., mephedrone, methamphetamine, GHB/GBL, ketamine, MDMA, cocaine, alkyl nitrites, sildenafil/tadalafil, cannabis). Reference lists of key reviews and observational studies were manually screened to identify additional sources. They included observational cohorts, cross-sectional surveys, ED case series, reviews, and implementation studies reporting ED-relevant outcomes. Given variability in definitions, self-reporting, and toxicological confirmation, findings are synthesised thematically rather than statistically.

Epidemiology and clinical context

Urban EDs across Europe report increasing numbers of chemsex-related intoxication presentations, with local trajectories shaped by substance availability, community norms, and access to preventive and treatment services. In Barcelona, chemsex-related visits increased from 13.1% of adult toxicology presentations in 2018 to 59.1 % in 2020, illustrating the scale of change that can occur in concentrated urban settings (1). Most cohorts are predominantly men who have sex with men (MSM) and show higher HIV seropositivity and psychiatric comorbidity than other intoxication populations, factors associated with agitation, psychosis, prolonged observation, and repeat ED attendance (2,6,7).

Although oral and intranasal routes predominate, intravenous drug administration ("*slamming*") carries disproportionate clinical risk. Presentations involving injection are more frequently complicated by bloodstream infections, vascular injury, and transmission of blood-borne viruses, necessitating targeted harm-reduction counselling and follow-up (8).

SUBSTANCE-SPECIFIC MOTIVATIONS AND ED PRESENTATIONS

Synthetic cathinones

Synthetic cathinones such as mephedrone and methylone are commonly selected for their ability to induce intense stimulation rapidly, heightened tactile sensitivity, sociability,

and increased sexual drive. These effects are mediated through potent monoaminergic activity involving dopamine, norepinephrine, and serotonin pathways. In the ED, presentations are dominated by features of sympathetic overactivation, including agitation, tachycardia, hypertension, hyperthermia, and diaphoresis. Additional risks include seizures, hyponatremia related to polydipsia or altered antidiuretic hormone regulation, and serotonin toxicity when combined with other serotonergic agents. Management focuses on benzodiazepine sedation, active cooling, intravenous fluids, and close monitoring for evolving neuropsychiatric and cardiovascular instability (3,4).

Methamphetamine

Methamphetamine plays a central role in many chemsex settings due to its long duration of action and capacity to sustain wakefulness, sexual focus, and physical endurance over extended periods. ED presentations frequently involve severe agitation, paranoid psychosis, hypertensive crises, tachyarrhythmias, hyperthermia, and rhabdomyolysis, often exacerbated by sleep deprivation and polydrug use. Acute management prioritises aggressive benzodiazepine sedation to reduce sympathetic drive, continuous cardiac monitoring, evaluation for ischemia when indicated, active cooling, and renal protection with intravenous fluids (3,6).

Gamma-hydroxybutyrate /gamma-butyrolactone

GHB/GBL is frequently used to counterbalance stimulant effects by promoting relaxation, emotional openness, and social disinhibition. Because the margin between desired and toxic doses is narrow, minor dosing errors or co-ingestion with alcohol or benzodiazepines can rapidly result in profound central nervous system depression. ED priorities include airway protection, supportive care, and vigilant monitoring, recognising the fluctuating course associated with redistribution and rapid awakening. Observation is typically required until consciousness and protective reflexes are reliably restored (5,9)

Ketamine

Ketamine is incorporated into some chemsex settings for its dissociative and analgesic properties, which can alter body perception, reduce performance-related anxiety, and intensify tactile experiences. ED presentations may include confusion, agitation, dissociation, perceptual disturbances, hypertension, tachycardia, and nystagmus. Although respiratory depression is uncommon at recreational doses, the risk increases with co-ingestion of other sedatives. Management emphasises supportive care, reduction of environmental stimuli, and benzodiazepines for distressing emergence reactions, with observation until mental status normalises (3).

3,4-Methylenedioxymethamphetamine

MDMA is commonly used for its empathogenic effects, which participants describe as enhancing emotional warmth, bonding, and tactile pleasure. Acute toxicity in the ED most often reflects dysregulated thermoregulation, excessive physical exertion, and disturbances of fluid balance, leading to hyperthermia, hyponatremia, and, in severe cases, rhabdomyolysis or hepatic injury. Management includes rapid external cooling, sedation to reduce muscle activity, cautious correction of electrolyte abnormalities, and monitoring for serotonin toxicity, particularly in the presence of other serotonergic substances (5).

Cocaine

Cocaine is used for its rapid-onset stimulant effects, including increased confidence and perceived sexual performance enhancement. ED presentations commonly involve anxiety, chest pain, tachyarrhythmias, and hypertensive urgency. When combined with phosphodiesterase type 5 (PDE5) inhibitors to counter stimulant-associated erectile dysfunction, cardiovascular complexity increases. ED care centres on benzodiazepine sedation, cardiac monitoring, evaluation for myocardial ischemia when indicated, and cautious blood pressure management (4).

Alkyl nitrites

Alkyl nitrites (“*poppers*”) are inhaled for their brief vasodilatory effects, facilitating receptive anal intercourse by reducing smooth muscle tone. Adverse effects prompting ED evaluation include dizziness, headache, hypotension, and syncope. Rarely, significant methemoglobinemia may occur, presenting with cyanosis and hypoxia unresponsive to oxygen therapy. Management consists of supportive care and intravenous methylene blue in symptomatic cases (5).

Phosphodiesterase type 5 inhibitors

PDE5 inhibitors such as sildenafil and tadalafil are used to maintain erectile function during prolonged sessions or in the context of stimulant use. ED-relevant adverse effects include hypotension, headache, flushing, visual disturbances, and, rarely, priapism. Concomitant use with nitrates for chest pain can result in severe hypotension, making careful medication history essential. Management in the emergency department is primarily supportive and includes haemodynamic monitoring, intravenous fluids for symptomatic hypotension, and avoidance of nitrate administration. Priapism requires urgent urological evaluation and treatment according to established emergency protocols (4).

Cannabis

Cannabis is often used adjunctively to modulate anxiety, promote relaxation, or smooth transitions between stimulant and depressant phases. ED presentations are usually mild but may include panic attacks, severe anxiety, nausea, or transient psychosis, particularly with high-potency products or polydrug use. Management is typically supportive, with reassurance and benzodiazepines for severe anxiety (6).

Novel psychoactive substances

An expanding range of novel psychoactive substances—including designer benzodiazepines, synthetic opioids, and

hallucinogenic compounds—has been increasingly identified in chemsex contexts. Their unpredictable potency and limited detection on routine toxicology screens complicate ED assessment. Presentations may involve prolonged sedation, respiratory depression, agitation, or hallucinations. Management relies on toxidrome-based supportive care, targeted antidotes when appropriate (e.g., naloxone), and early toxicology consultation (10,11).

Polydrug patterns and mixed toxidromes

Chemsex commonly involves sequencing multiple substances to achieve a desired experiential arc, such as stimulants for arousal and endurance, MDMA for intimacy, GHB/GBL for disinhibition, ketamine for dissociation, and adjunctive agents for performance support or anxiety modulation. The cumulative effects of serotonergic agents, stimulant–vasoactive combinations, and central nervous system depressants produce overlapping and sometimes contradictory clinical features. These interactions increase the risk of hyperthermia, arrhythmia, serotonin toxicity, and respiratory compromise, particularly in the setting of prolonged sessions and sleep deprivation (1,2,11).

Presentations commonly involve intentional polydrug use and complex mixed toxidromes.

Emergency department recognition and acute management

Initial ED assessment should include a brief, nonjudgmental inquiry to establish chemsex context, including substances used, dosing intervals, routes of administration, session duration, and co-ingestion of alcohol or prescribed medications. Airway and breathing require particular attention in presentations involving depressants such as GHB/GBL or designer benzodiazepines. Circulatory monitoring is essential for stimulant-related toxicity, with benzodiazepines forming the cornerstone of treatment to reduce sympathetic overactivity.

Emergency management prioritises supportive care, benzodiazepine sedation, and early recognition of complications.

Hyperthermia and electrolyte disturbances require prompt recognition and intervention, including active cooling, sedation, and cautious correction of hyponatremia. Antidotes such as naloxone or methylene blue should be used when indicated, while flumazenil is generally avoided due to seizure risk in polydrug exposures. Given limitations of routine toxicology, clinical pattern recognition remains central to management (5, 10).

Harm reduction and implementation in emergency departments

ED encounters represent a critical point of contact during which individuals may be receptive to risk-reduction messaging and linkage to ongoing care. Brief interventions, rapid HIV and STI testing, post-exposure prophylaxis initiation, and referral to PrEP, addiction, and mental health services have shown feasibility and early effectiveness in reducing short-term harm and improving engagement (2, 9,11-13). Standardised screening tools, embedded order sets, and partnerships with community-based services facilitate consistent, stigma-free care and continuity of care beyond discharge (8).

Emergency departments provide an opportunity for harm-reduction interventions and linkage to sexual health and addiction services.

Limitations and research priorities

The available evidence is constrained by reliance on self-reported substance use, geographic concentration in Western Europe, inconsistent definitions of chemsex, and limited laboratory confirmation of emerging substances. Future priorities include standardised ED case definitions, prospective multicentre cohorts, expanded rapid toxicology for novel agents, and intervention trials evaluating ED-based harm-reduction bundles with outcomes such as repeat ED utilisation, linkage to care, and incident HIV/STI diagnoses (14).

Conclusion

Chemsex-related emergency department presentations arise from deliberate, highly structured patterns of multi-substance use designed to shape sexual experience, endurance, and interpersonal connection. Understanding how these motivations intersect with pharmacological risk enables clinicians to anticipate complex toxidromes, prioritise supportive care, and avoid pitfalls associated with single-substance assumptions. By integrating structured screening, disciplined acute management, and clear pathways to sexual health, addiction, and mental health services, emergency departments can reduce morbidity while delivering patient-centred, stigma-free care in an evolving clinical landscape.

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