

SEPSIS OR POISONING? A DIFFERENTIAL-DIAGNOSTIC CHALLENGE IN THE USE OF ADDICTIVE COMPOUNDS

Eka Kurdadze¹, Levan Ratiani²

¹Assistant Professor, Department of Anesthesiology, Resuscitation and Toxicology, Tbilisi State Medical University, Head of the Toxicology Department, First University Clinic

²Professor, Head of the Department of Anesthesiology, Resuscitation and Toxicology, Tbilisi State Medical University, Director General of the First University Clinic

Presenting author: Eka Kurdadze

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Introduction. In emergency and intensive care practice, clinicians frequently encounter patients presenting with impaired consciousness, hemodynamic instability, and multi-organ dysfunction - a clinical picture that may equally correspond to septic shock or to severe intoxication caused by addictive compounds [1]. In toxicologically low-resource settings, where toxicological screening (including qualitative testing) is practically unavailable, differential diagnosis becomes even more challenging. Furthermore, the use of addictive compounds itself increases the risk of genuine bacterial complications - infections related to intravenous use [5] or aspiration, as well as immune suppression caused by the myelosuppressive effect of alcohol [6] - which often become superimposed on the initial toxic presentation at a later stage.

Case illustration. A 27-year-old male patient was admitted in an unconscious state, with respiratory failure (SpO₂ 82%), unstable hemodynamics (BP 70/52 mmHg), miotic pupils, and hypoglycemia. History indicated intake of alcohol, cannabis, and suspected methadone; a transient response to naloxone was observed. Initial laboratory findings revealed severe mixed metabolic acidosis with a high anion gap [3], massive cytolytic liver injury with a shock-type pattern, severe coagulopathy, and acute kidney injury requiring repeated hemodialysis. CRP was within normal limits on admission, consistent with a primary toxic/shock process [2]; by the second week, a rise in CRP was observed, corresponding to bronchoscopically confirmed aspiration pneumonia - a genuine secondary bacterial complication superimposed on the primary toxic condition. Empirical antibacterial therapy, detoxification, hemodialysis, and supportive intensive care led to a gradual favorable outcome.

Aim. To identify objective clinical and accessible laboratory criteria that assist emergency physicians in toxicologically low-resource settings in: a) differentiating primary toxic and septic complications, and b) promptly recognizing genuine bacterial infection superimposed at a later stage.

Discussion. In initial assessment, priority should be given to objective toxidromic signs, which do not depend on verbal information [1] - this is particularly important, as history-taking is often of limited reliability due to stigma and legal fears associated with illicit substance use. Among readily available routine laboratory parameters, the anion/osmolar gap and differential white blood cell count (including screening for agranulocytosis in chronic alcohol users [6]) are informative; the absolute lactate value alone is insufficient for differentiation, since hyperlactatemia occurs both in tissue-hypoperfusion (type A) and non-hypoxic (type B) states [4] - its mechanism of origin and clearance dynamics are more informative than a single value. At later stages, dynamic monitoring (CRP trend, new clinical/radiological signs) is critical for the timely recognition of genuine secondary infection [2], particularly in intravenous substance users (risk of bacteremia/endocarditis) [5] and chronic alcohol users (myelosuppression) [6].

Conclusion. Toxic and septic complications frequently not only mimic one another but also evolve into one another over time. An accurate, timely, and stage-adapted diagnostic-therapeutic approach - one that accounts for both the primary toxic process and the risk of a genuine superimposed secondary bacterial complication - is decisive for preserving patient survival, particularly in toxicologically low-resource settings.

References

- [1] Kaaniche FM, et al. Acute drug intoxication: predictive factors for hospitalization. *Pan Afr Med J.* 2025.
- [2] Diagnostic performance of procalcitonin and presepsin in sepsis: a systematic review and meta-analysis. *BMC Emerg Med.* 2025;25.
- [3] Lontos A, Samanidou V, Athanasiou L, Filippas-Ntekouan S, Milionis C. Acute Ethanol Intoxication: An Overlooked Cause of High Anion Gap Metabolic Acidosis With a Marked Increase in Serum Osmolal Gap. *Cureus.* 2023;15(4):e37292.
- [4] Kuttub HI, et al. Using pCO₂ Gap in the Differential Diagnosis of Hyperlactatemia Outside the Context of Sepsis: A Physiological Review and Case Series. *J Intensive Care Med.* 2019.
- [5] Infective Endocarditis in People Who Inject Drugs: A Call for Patient-Centered, Multidisciplinary Care. American Heart Association Professional Heart Daily. 2025.
- [6] Gobalakrishnan S, et al. Alcohol-induced susceptibility to pulmonary bacterial infections: A narrative review. *Alcohol Clin Exp Res.* 2025.