Self-poisonings by use of ‘suicide kits’ and a ‘home made’ multi-xenobiotics mixes- is it a growing problem in forensic toxicology?

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Introduction Year by year, the field of psychiatry faces an escalating crisis, particularly concerning children and adolescents. This crisis stems from the rising prevalence of mental disorders among the population and the constrained access to professional psychiatric and psychological assistance. The global impact of the COVID-19 pandemic, coupled with associated social isolation, has further exacerbated this trend. The surge in mental disorders has also coincided with an increase in suicide attempts. Over the past few years, scientific reports have emerged on the utilization of online-acquired 'suicide kits' for self-harm. These kits typically consist of various compounds with distinct mechanisms of action, whose simultaneous use may induce severe, life-threatening effects. Additionally, adolescents have been observed learning to assemble such 'kits' through internet forums.

Methods Post-mortem biological matrices and evidences found at the scene were subjected to analysis using a variety of techniques, including LC-MS/MS, GC-MS/MS, and HS-GC-FID/FID. This comprehensive approach covered a broad spectrum of substances, encompassing drugs, illicit substances, NPS, volatile compounds. Information pertaining to the circumstances of death was obtained from prosecutors or judicial authorities.

Results The authors will scrutinize cases of death concerning the composition of 'suicide kits,' explaining the mode of action, toxicity, and concentrations of substances identified in post-mortem matrices. Challenges in interpretation arising from factors such as inappropriate collection and storage conditions of post-mortem materials and the instability of xenobiotics will be discussed.

Conclusions The authors' toxicological findings corroborate recorded suicide cases, involving both purchased 'suicide kits' and self-composed multi-xenobiotic mixtures. In instances of suspected suicidal death resulting from xenobiotics, the authors recommend conducting potentially extensive toxicological analyses utilizing various analytical techniques. The final interpretation of toxicological results must hinge on a thorough understanding of the entire case file, underscoring the necessity for close collaboration among forensic toxicologists, pathologists, and judicial authorities.