

Investigating the acute pathology processes among MDMA-related deaths in Australia

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Introduction: Processes involved in MDMA-related deaths are complex, involving multiple factors including the pharmacokinetics of the drug, environmental factors (such as temperature) and behavioural factors (such as the use of other substances). Contaminants of MDMA, such as paramethoxyamphetamine (PMA) have also resulted in death. This paper will outline the epidemiology of MDMA mortality, and investigate the acute pathology processes recorded among MDMA-related deaths in Australia.

Method: Data extracted from the National Coronial Information System (NCIS) on deaths where MDMA toxicity was considered the underlying cause of death (with or without contributions from other drugs). Autopsy and coroner's reports were analysed for acute and chronic pathology.

Key findings: There were 308 deaths attributed to MDMA-related toxicity during the period 2001 to 2019. Preliminary analyses show acute cardiac complications were present among; 1) one-third (34%) of all deaths; 2) half (53%) of the MDMA toxicity; and one-quarter (29%) of multiple drug deaths. Hyperthermia and serotonin toxicity were also recorded (14% and 19% respectively) among deaths and were significantly higher among MDMA only toxicity deaths (29% and 32%) than multiple drug deaths (9% and 15%). Hyponatremia was not well captured post-mortem. Decedents 25 and over were more likely to have chronic underlying cardiac disease than their younger counterparts (42% vs 23%). Half the deaths with acute cardiac complications occurred in the absence of underlying disease.

Discussion: Changes in MDMA markets, with increasing potency and purity of MDMA have led to increasing MDMA-related deaths. Pathology largely related to acute cardiac problems, with half occurring without underlying disease, highlighting the dangers of MDMA toxicity.

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