K41 Toxicology of Deaths Associated With "Ecstasy"

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After attending this presentation, attendees will understand the interpretation of MDMA concentrations in postmortem toxicology.

This presentation will impact on the forensic community and/or humanity by demonstrating how MDMA concentrations in postmortem toxicology can only be interpreted in the context of other information. Considerable overlap exists between fatal concentrations and those seen in deaths from trauma.

3,4-Methylenedioxymethylamphetamine (MDMA), more popularly known as "Ecstasy" has been a widely used recreational drug in the UK since the beginning of the 1990s [1]. Deaths were first reported in the UK in the early 1990s at Raves and clubs, with deaths attributable to hyperpyrexia, water intoxication and cardiac dysrhythmias. Deaths from hepatic necrosis have also occurred. This study of deaths seen in Yorkshire in the North of England reports the toxicological findings where MDMA and related drugs have been found on post-mortem toxicology.

17 deaths were attributed to the effects of MDMA or MDEA (3,4- methylenedioxyethylamphetamine) alone. In 13 deaths collapse was rapid. Peripheral blood (femoral) analysis in these rapid deaths revealed MDMA concentrations of 0.478 mg/L – 53.9 mg/L. The mean concentration was 8.43 mg/L, median 3.49 mg/L. Two cases were also positive for MDEA with concentrations of 3.4 mg/l and 3.5 mg/L. 3,4-Methylenedioxyamphetamine (MDA) concentrations ranged from 0.012 – 8.5 mg/L (mean 1.5 mg/L, median 0.79 mg/L). Other drugs found were cannabinoids (6), amphetamine (5), ethanol (5), cocaine (1), LSD (1), benzodiazepine (1).

In 29 cases, death was attributed to polydrug use, MDMA (27), MDEA (1), MBDB (1). In 22 cases MDMA was recorded in blood, range 0.04 to 41.5 mg/L. The mean value in these deaths was 2.90 mg/L, median 0.76 mg/L. The other principal drugs in these cases were cannabinoids (16), ethanol (12), heroin (11), benzodiazepines (9), amphetamine (8), antidepressants (6), methadone (5), cocaine (5), GHB (2).

In 29 cases death was traumatic, homicide (8), vehicular collision (10), fall from height (6), drowning (4), hypothermia (1). In 24 cases MDMA was found in blood with concentrations ranging from 0.035 mg/L to 4.81 mg/L, mean 0.862 mg/L, median 0.483 mg/L. Other drugs found were ethanol (17), cannabinoids (10), amphetamine (5), cocaine (4), antidepressants (2), ketamine (1).

In conclusion, MDMA showed a wide range of concentrations. Higher concentrations were seen where death was attributed to the effects of MDMA alone, but considerable overlap exists between concentrations seen in drug related deaths and deaths due to trauma.

References:

1. Milroy CM. Ten Years of "Ecstasy." Journal of the Royal Society of Medicine. 1999; 92: 68-72.

Ecstasy, Death, Toxicology

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