



K25 Relationship Between Drug Levels and the Causes and Manners of Death in Methamphetamine Related Casualties: A Retrospective Study

Wen-Ling Lin, BS, and Kai-Ping Shaw, MD, PhD, Institute of Forensic Medicine, Ministry of Justice, Taiwan, 166-1, Sec 2, Keelung Road, Taipei, 10677, TAIWAN, ROC; and Dong-Liang Lin, PhD, Institute of Forensic Medicine, 16 Lane 175, Tung-Hwa Street, Taipei, 10677, TAIWAN, ROC*

After attending this presentation, attendees will have knowledge of methamphetamine blood/urine levels distribution in the manners of death with a retrospective review cases for seventeen years.

This presentation will impact the forensic science community by utilization of the toxicological profiles in the determination of forensic parameters including the cause and manner of death, especially for methamphetamine related fatalities.

Methamphetamine (MAP), an illicit, stimulant drug, has resulted in serious social problems in Taiwan and other parts of the world. A pilot study was designed to determine whether toxicological profiles of decedents' body fluids can be used to implicate the status of mood at the moment of death. High blood/urine ratios can be associated with acute MAP use, shortly after MAP intake and a manic emotional status. In comparison, a low blood/urine ratio can be associated with chronic MAP use, after a longer period of time following MAP intake and a depressive emotional status. This retrospective review of 18,973 fatalities collected from Institute of Forensic Medicine in Taiwan from 1991 to 2007. MAP levels both in blood and urine that were greater than 0.02 mg/L and with positive impressions of the causes and manners of death were found in 212 cases. Distinct patterns of MAP levels were distinguished to be associated with manner or pattern of death.

Higher MAP concentrations were found in blood than in urine when death occurred shortly after an overdose of MAP that was linked either to accidental overdose (3.24 ± 0.73 mg/L blood, 15.08 ± 2.38 mg/L urine and 22.07 ± 4.22 urine/blood ratio; $n=88$) or to intentional suicide (12.81 ± 5.30 mg/L blood, 14.68 ± 5.57 mg/L urine, and 15.38 ± 12.96 urine/blood ratio; $n=7$). Lower MAP blood levels and urine/blood ratios were found in cases of accidental deaths (0.31 ± 0.06 mg/L blood, 5.72 ± 1.31 mg/L urine and 34.86 ± 9.81 urine/blood ratio; $n=30$), and suicides not related to high MAP dose (0.55 ± 0.13 mg/L blood, 10.35 ± 2.75 mg/L urine and 34.71 ± 9.65 urine/blood ratio; $n=20$), thus making a highly suspicion of influence of MAP mediated through depression and psychotic behaviors. Much higher MAP urine/blood ratios and lower MAP blood levels were found among casualties of natural causes (0.40 ± 0.09 mg/L blood, 14.88 ± 4.60 mg/L urine, and 81.07 ± 44.86 urine/blood ratio; $n=19$) or homicidal causes (1.26 ± 0.19 mg/L blood, 13.19 ± 1.95 mg/L urine, and 16.66 ± 2.80 urine/blood ratio; $n=48$), suggesting these were relatively unaffected by the lower blood level of MAP. Chronic MAP abusers appear to provoke violent behaviors resulting in the homicidal fatalities, and relationship to amphetamine (AMP)-like psychosis is postulated.

These results suggest that the toxicological profile of MAP concentrations in blood and urine can play a crucial role and are related better to patterns of death than manner of death. The findings may enable better utilization of the toxicological profiles in the determination of forensic parameters including the cause and manner of death in MAP related fatalities.

Methamphetamine, Manner of Death, Cause of Death