K6 Relationship of Methamphetamine (MAP) Levels to Causes and Manners of Death in MAP-Related Casualties

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Diverse psychotic behaviors induced by MAP could be recognized by the MAP level in blood and urine by pharmacokinetics and manners of death so as to predict the psychotic behaviors before casualty. The goal of this presentation is to present a pilot designed to determine whether toxicological profiles of the decedents' body fluids could be used to implicate the status of mood at the moment of death.

This presentation will impact the forensic community and/or humanity by presenting results, which suggest that the toxicological profiles are better related to patterns of death than manner of death. The findings may enable better utilization of the toxicological profiles in future judgment of forensic parameters including the cause and time of death.

Illicit drug abuse of MAP is a worldwide problem, and has caused a serious social crisis in the Taiwan community. MAP-induced fatalities with a high homicide rate (20-30%) are much higher in comparison with opiaterelated fatalities' low homicide rate (0-5%). MAP is a psychostimulant and long-term MAP abusers may become addicts demonstrating psychosis, self-destructive behaviors, emotional disturbances, and schizophrenia-like behavior (MAP psychosis). MAP can induce long-lasting deficits of the innervations in the striatum from dopamine neurons of the substantia nigra. Diverse psychotic behaviors induced by MAP could be recognized by MAP level in blood and urine by pharmacokinetics and manners of death so as to predict the psychotic behaviors before the casualty. A pilot study was designed to determine whether toxicological profiles of decedents' body fluids could be used to implicate the status of mood at the moment of death. High blood/urine ratios can be associated with acute MAP use, a short period of time after MAP intake, and a manic emotional status. In comparison, a low blood/urine ratio can be associated with chronic MAP use, a longer period of time after MAP intake, and a depressive emotional status. A retrospective review of 586-MAP related fatalities collected from Forensic Medicine Center and Institute of Forensic Medicine in Taiwan, which had MAP levels in either blood or urine that were greater than 0.10 mg/L, found 88 cases with positive impressions of the causes and manners of death (3 unknown manner of death are excluded). Distinct patterns of MAP levels were found to be associated with a unique manner 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 (7.75 ± 1.99 µg/ml blood, 17.24 ± 4.27 µg/ml urine and 2.77±1.04 blood/urine ratio; n=27) or to intentional suicide (15.71 ± 7.23 µg/ml blood, 13.86 ± 1.6 µg/ml urine and 1.23±0.62 blood/urine ratio; n=4). Lower MAP blood levels and blood/urine ratios were found in cases of deaths by accidents (0.33 ± 0.09 µg/ml blood, 4.83 ± 1.89 µg/ml urine and 1.64±1.05 blood/urine ratio; n=13) and suicides (0.77 ± 0.49 µg/ml blood, 6.02 ± 1.83 µg/ml urine and 0.43±0.19 blood/urine ratio; n=9) not by caused MAP toxicity, making an influence of MAP mediated through depression and psychotic behaviors highly suspect. Much lower MAP blood/urine ratios were found among casualties of natural (0.40 ± 0.13 µg/ml blood, 18.56 ± 6.73 µg/ml urine and 0.38 ± 0.23 blood/urine ratio; n=12) or homicidal causes (1.07 ± 0.24 µg/ml blood, 10.56 ± 1.96 µg/ml urine and 0.14±0.03 blood/urine ratio; n=23), suggesting that these deaths were relatively unaffected by the lower blood level of MAP. Chronic MAP abusers with low blood and high urine MAP levels appear to provoke violent behaviors resulting in the homicidal fatalities, and a relationship to amphetamine (AMP)-like psychosis is postulated. These results suggest that the toxicological profiles are related better to patterns of death than manner of death. The findings may enable better utilization of the toxicological profiles in future judgment of forensic parameters including the cause and time of death. (Supported by NSC 82-0412-B-016-075; 83-6016-F-096).

Methamphetamine, Manner of Death, Drug Concentrations

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