



K20 The Concentration and Distribution of Methamphetamine (MA) and Amphetamine (AM) in MA-Related Postmortems

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The goal of this presentation is to inform attendees that concentrations of MA and AM in the blood could be estimated with the postmortem concentrations in Bile Juice (BJ), when Peripheral Blood (PB) or Cardiac Blood (CB) cannot be taken.

This presentation will impact the forensic science community by presenting a study that is expected to play a major role in estimating the postmortem concentration of MA and AM in MA-related death cases.

MA is a frequently abused drug in southern parts of South Korea due to the nature of the port area. Also, MA-related deaths often occur in this area more than in other areas of South Korea. This study compared the concentrations and distributions of MA and AM in MA-Related Postmortems (MRPs). Gastric content (GS), CB, PB, BJ, and urine were analyzed in 20 autopsy cases of MRPs.

A Forensic Toxicant Screening Test (FTST) for medicine, pesticides, and cyanide in GS, CB, and urine was conducted by Gas Chromatograph/Mass Spectrometry (GC/MS) or liquid chromatograph/tandem mass spectrometry.

A Forensic Drug Screening Test (FDST) for MA, delta-9-carboxytetrahydrocannabinol, cocaine, and benzodiazepine in urine was conducted by immunoassay, and ethyl alcohol screening in PB by GC. MA and AM, if detected by the FDST, were subsequently confirmed and quantified by re-extraction and re-analysis in CB, PB, and BJ by GC/MS.

The postmortem MA and AM concentrations (mg/L) ranged from 0.42-204.10 (average 18.46) and 0.001-8.70 (average 0.68) in CB ($n=15$), 0.11-194.40 (average 13.29) and 0.001-7.30 (average 0.54) in PB ($n=15$), and 0.09-149.40 (average 27.46) and 0.001-4.20 (average 0.83) in BJ ($n=9$). The ratios of CB to PB ($n=12$) for MA and AM were 0.79-6.59 (average 1.92) and 0.21-6.67 (average 1.87), BJ to PB ($n=8$) were 0.77-10.50 (average 4.62) and 0.58-12.67 (average 5.36).

These data suggest that the postmortem MA and AM concentrations in CB are approximately two times (average 1.92 and 1.87) higher than those in PB, and four to five times (average 4.62 and 5.36) higher in BJ. The CB and BJ to PB ratios less than five are consistent with little to no propensity for postmortem redistributions; these data demonstrate that MA and AM are unlikely to exhibit significant redistributions.

According to these detection ratios, the concentrations of MA and AM in the blood could be estimated with those in BJ of the postmortem, which cannot take PB or CB.

Therefore, this study expects to play a major role in estimating the postmortem concentration of MA and AM in MA-related death cases. Additionally, it could assist in or predict the interpretation of MA intoxications and redistributions for the MRPs.

Methamphetamine, Postmortem, Concentration