



K59 Statistical Interpretation of Meprobamate Concentrations in Bone Marrow, Vitreous, and Bile

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Upon completion of this presentation, participants will have some tools to interpret postmortem meprobamate concentration in bone marrow, vitreous and bile. The proposed methodology could be applied to interpret the concentrations measured in other biologic matrices.

In numerous cases of toxic death investigations, the interpretation of blood concentrations is difficult (postmortem redistribution, putrefied bodies) or impossible (lack of blood sample). This presentation will impact the forensic community by enabling an interpretation of meprobamate concentrations measured in sample types other than blood sample.

The interpretation of concentrations in samples other than blood is complex due to the lack of reference ranges. The presented statistical methodology enables the decision of an intoxication or a therapeutic case with a quantified risk of error, which is very important when discussing the results in court.

The presented study is based on 116 forensic cases. On the basis of blood concentration, 70 cases were classified as therapeutic blood concentrations and 46 as toxic blood concentrations. For each case, at least one of the following sample types was collected during the autopsy: bile (n=107), right vitreous (n=40), left vitreous (n=43), and bone marrow (n=51). Meprobamate was quantified by GC/MS. For each sample type, the average concentration and the standard deviation showed that the meprobamate concentrations between the toxic and therapeutic populations were statistically significantly different.

Modeling of the toxic and therapeutic populations allowed the definition of a toxic threshold with less than 5% false positives. Multivariate analysis, such as Principal Components Analysis (PCA) and Partial Least Square Data Analysis (PLSDA) showed that it was possible to distinguish therapeutic cases and the toxic cases by simultaneous use of the concentrations measured in the 4 alternative matrices.

Practical applications of these results on some cases will be presented, as well as cases previously published in the international literature.

Meprobamate, Bone Marrow, Forensic Toxicology