K39 Propofol Analytical Challenges and Interpretation

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After attending this presentation, attendees will have an overview of propofol concentrations reported in 71 cases between July 2008 and July 2009 along with relevant case history where available.

Propofol is a sedative-hypnotic widely used as an intravenous anesthetic agent. There is also increasing incidences of propofol abuse, especially among healthcare workers. Recently, propofol has garnered media attention and the DEA has indicated it is considering classifying propofol as a "scheduled drug", tightening restrictions on its distribution and use. Some lots of propofol were recently recalled due to contamination with suspected endotoxins. Propofol concentrations in previously reported overdose deaths were 0.22 – 5.3 µg/mL and the concentration in a homicide case was 4.3 µg/mL.

Cases submitted to NMS Labs that included a positive propofol finding were included in the analysis. Quantitative propofol analysis was performed if indicated by a gas chromatography-mass spectrometry screen performed at NMS Labs or if ordered directly by the submitting agency. Propofol quantification was conducted using capillary gas chromatography with flame ionization detection. The method has a limit of quantification of 0.05 µg/mL. Once identified, cases were reviewed and sorted according to the information initially available at the time of abstract preparation.

During a one-year period, there were 71 cases with quantifiable propofol. In two cases, propofol quantification was approximated due to sample matrix problems; these were excluded from further analysis. In the remaining 69 cases, propofol concentrations were 0.05 – 110 µg/mL (mean= 2.55 ± 13.35 µg/mL; median= 0.35 µg/mL). Forty specimens

were identified to have been collected during autopsy; the average propofol concentration in these cases was 3.29 ± 17.31 µg/mL. The elevated mean and standard deviations can be attributed to two cases with propofol concentrations of 20 and 110 µg/mL. The mean propofol concentration from central blood (0.84 ± 1.03 µg/mL) was higher than peripheral blood (0.44 ± 0.31 µg/mL) in the post-mortem cases where blood source was identified.

Of the 40 specimens collected during autopsy, case histories indicated that 12 patients were hospitalized at the time of death, five of which died while under or recovering from anesthesia. Lack of sufficient case history prohibits identification of anesthesia use in the other seven hospital deaths. The average propofol concentrations were similar for the hospitalized patients overall and those for which anesthesia use was indicated, 0.79 ± 1.03 and 0.98 ± 1.52 µg/mL, respectively. One patient who died during anesthesia induction had a propofol concentration of 3.7 µg/mL and history indicated the patient had hepatitis C. If this individual is excluded, the average propofol concentration for the remaining 4 patients was 0.30 ± 0.16 µg/mL.

Two cases were described as "suspected propofol overdose" and in a third case syringes containing propofol and fentanyl were included, though it is unclear if the patient in this case was dead. Propofol concentrations were 1.2 and 1.0 µg/mL in the suspected overdose cases and 0.20 Dg/mL in the case where syringes were present. In one case, propofol testing was performed based on "reasonable suspicion/cause" and a serum propofol concentration of 1.4 µg/mL was reported.

The data provided is based on information provided with case submission and thus available at the time this abstract was prepared. **Propofol, Blood Concentrations, Death**

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