K16 Fentanyl Concentrations in 23 Postmortem Cases From Hennepin County Medical Examiner's Office

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After attending this presentation, the attendee will have better interpretability of postmortem blood fentanyl concentrations and its role in one's death.

This presentation will impact the forensic community and/or humanity by improving the understanding of postmortem blood fentanyl concentrations and showing the importance of the deceased's past medical history in signing out the cause and manner of death.

The purpose of this study was to compare blood fentanyl concentrations in fentanyl-related deaths with fentanyl concentrations found incidentally at autopsy, as well as with fentanyl concentrations found in hospitalized patients receiving fentanyl. A retrospective study, between the years 1995 to 2005, of postmortem cases from the Hennepin County Medical Examiner's Office was conducted in which fentanyl was detected. Gas chromatography – mass spectrometry was used to quantify all fentanyl levels. Of the 23 postmortem cases in which fentanyl was identified, 19 (82.6%) were deemed to be drug overdoses. Fentanyl, alone, was responsible for 7 of the 19 (36.8%) overdose deaths. Mean and median fentanyl concentrations were 38.7 µg/L and 25 µg/L, respectively, with a range of 5 to 120 µg/L. Six of the cases were signed out as accidental, one as undetermined. The remaining 12 of the 19 (63.1%) cases were mixed drug overdoses, predominantly including other opiates, barbiturates, benzodiazepines, and alcohol. Mean and median fentanyl concentrations were 30.8 µg/L and 13.5 µg/L, respectively, with a range of 5 to 152 µg/L. All of the mixed drug overdoses were signed out as accidental. Four cases where fentanyl was an incidental postmortem finding were all signed out as natural deaths; blood concentrations in this group were 2, 2, 2, and 15 µg/L. The deceased with the blood fentanyl concentration of 15 µg/L was being treated for chronic pain related to metastatic squamous cell carcinoma of the head and neck. This fentanyl level was greater than or equal to three of the fentanyl-only overdose deaths and seven of the mixed drug overdose cases.

For comparison, 11 inpatients receiving fentanyl were identified over one 24-hour period. Two of the patients had fentanyl concentrations of 8.5 µg/L and 9.9 µg/L; these levels were higher than one of the fentanyl-only related deaths (5 µg/L) and two of the mixed drug overdose cases (5 µg/L and 7 µg/L). Both patients had been receiving opiates, including fentanyl, for chronic pain for more than three months. The other nine inpatient concentrations were less than 4 µg/L.

This study shows higher mean and median blood fentanyl concentrations in cases where fentanyl alone was determined to be the cause of death when compared to cases where fentanyl was part of a mixed drug overdose. There is considerable overlap between fentanyl concentrations in fentanylrelated deaths and fentanyl concentrations in hospitalized patients being treated for chronic pain. The interpretation of fentanyl concentrations in postmortem cases must be interpreted in context of the deceased's past medical history and autopsy findings.

Fentanyl, Postmortem, Chronic Therapy

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