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Toxicology-2020 : Analysis of Fentanyl in Postmortem Blood Using Biocompatible Solid-Phase Microextraction: A Review Article- Grant CM Department of Chemical and Physical Sciences, Cedar Crest College, PA 18104, USA

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Biocompatible Solid-Phase Microextraction (BioSPME) fiber in Grant et al. original work was to create an analysis method that is faster and simpler in identifying fentanyl in postmortem blood than current analysis methods. While the study was able to demonstrate that fentanyl was able to be absorbed onto the fiber and analyzed through the use of GC-MS and LC-MS-MS, the data reported was beyond the sensitivity for both instruments. The purpose of this communication is to provide more information regarding the methodology and sensitivity for both instruments and to reinterpret the data when comparing to the results from Health Network Laboratories. Based on the reinterpreted data, this current method was consistent with the results from Health Network Laboratories in identifying fentanyl in postmortem blood concentration equal to or greater than 21.4 ng/mL.

The data originally presented from the study was interpreted beyond the sensitivity for both the GC-MS and LC-MS-MS. The purpose for this commentary is to reinterpret the data from the original study by providing the sensitivity and more detailed methodology for both the GC-MS and LC-MS-MS used.

GC-MS- Sensitivity when screening for fentanyl for the BioSPME method, the following calibrator solutions were prepared by diluting a 1 mg/mL methanolic fentanyl stock standard: 5, 10, 15, 25, 50, 75, and 100 µg/mL. A calibration curve was generated by analyzing calibrator solutions in triplicate. Figures of merit data, equation for regression (R2), Limit of Detection (LOD), and Limit of Quantitation (LOQ) were obtained from the calibration curve.

LC-MS-MS- A calibration curve was generated by analyzing extracted samples in triplicate over two days using the C18 BioSPME fiber. Figures of merit data, coefficient of determination (R2), Limit of Detection (LOD), and Limit of Quantitation (LOQ) were obtained from the calibration curve. The fentanyl extraction calibrator solutions produced a Linear Dynamic Range (LDR) from 1-500 ng/mL with an R2 value of 0.9927 and 0.9994 for the 188 and 105 ions, respectively.

The compared to the results obtained by Health Network Laboratories. Based on the criteria set out for identifying fentanyl for this study, the BioSPME method was consistent with three Health Network Laboratories results in identifying fentanyl that was equal to or greater than 21.4 ng/mL. e LOD and LOQ for fentanyl were determined using the LINEST function in excel.

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