H95 Acetyl Fentanyl: Trends and Concentrations in Metro Detroit

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After attending this presentation, attendees will be able to recognize acetyl fentanyl on postmortem toxicology as a marker of illicit fentanyl.

This presentation will impact the forensic science community by making forensic pathologists and toxicologists more knowledgeable regarding the possible etiologies of the presence of acetyl fentanyl in postmortem toxicology.

Acetyl fentanyl (N-[1-phenethylpiperidin-4yl]-N-phenylacetamide), a derivative of fentanyl, is a non-prescription synthetic opioid that is 4 to 5 times more potent than heroin and 15 times more potent than morphine, but much less potent than fentanyl and other fentanyl analogs.[1] Acetyl fentanyl is used in the adulteration of fentanyl, heroin, and cocaine and the first outbreak of acetyl fentanyl-related deaths was reported in Rhode Island in 2013.[1]

The trends and concentrations of acetyl fentanyl-related deaths have been followed at the Wayne County Medical Examiner's Office (MEO) in Detroit, MI, from 2015 to the present. Between April 2016 and January 2017, 21 deaths were reported at the Wayne County MEO, where acetyl fentanyl was found in the decedent's peripheral blood; these were compared to the previously published 75 acetyl fentanyl-related deaths between February 2015 and March 2016 from the same MEO.

Of the recent deaths, 62% (13) were male, 38% (8) female, 52% (11) were White, 38% (8) Black, and 1% (2) Hispanic. The mean age was 44.5 years. The mean concentration in the peripheral blood was 0.9ng/mL (range 0.1ng/mL to 2.7ng/mL). All 21 deaths had fentanyl, 52% (11) heroin, 71% (15) other opiates, 24% (5) cocaine, 0.5% (1) both heroin and cocaine, 29% (6) benzodiazepines, and 20% (4) ethanol present in the peripheral blood. Compared to the 75 previously reported acetyl fentanyl-related deaths, in the period between February 2015 and March 2016, the current data exhibits markedly decreased acetyl fentanyl concentrations. The average acetyl fentanyl concentration from the previous data set was 9.25ng/mL with a range of 0.28ng/mL to 37ng/mL; the current data revealed an average acetyl fentanyl concentration of 0.9ng/mL with a range of 0.1ng/mL to 2.7ng/mL. Also in the recent data was a higher percentage of cases with multiple drugs, with other opiates present in 71% of the deaths compared to the 21% reported previously. The other drugs present were found in similar frequencies and with a similar demographic distribution.

All 21 of the recent cases had acetyl fentanyl concentrations below 2.7ng/mL with an associated toxic concentration of fentanyl (>3ng/mL) in the peripheral blood. This means that the primary drug toxicity was due to fentanyl. Since acetyl fentanyl has not been reported in association with the clinical use of fentanyl, the former's consistently observed lower peripheral blood concentrations are most likely an artifact in the manufacture of the consumed illicit fentanyl.

Reference(s):

1. Lozier, M. et al. Acetyl Fentanyl, a Novel Fentanyl Analog, Causes 14 Overdose Deaths in Rhode Island, March–May 2013. *J Med Toxicol.* 2015 Jun; 11(2): 208–217.

Acetyl Fentanyl, Concentration, Toxicity

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