K40 Fentanyl in Seven Medical Examiner's Cases in the City and County of San Francisco

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The goal of this presentation is to alert the general community on the apparent rise of fentanyl in medical examiner cases and will also aid forensic toxicologists in the interpretation of postmortem fentanyl levels.

This presentation will impact the forensic community and/or humanity by alerting the general community on the apparent rise of fentanyl in medical examiner cases and will also aid forensic toxicologists in the interpretation of postmortem fentanyl levels.

Fentanyl, a potent opioid analgesic and extremely potent ▮ agonist, is being detected with increasing frequency in medical examiner cases. At one time, fentanyl abuse was a practice largely confined to medical professionals with ready access. However the advent of the fentanyl patch has drastically changed the situation, and the pattern of abuse is becoming more like that observed with other, less exotic, drugs of abuse. Routes of administration for fentanyl include transdermal, transmucosal/oral, intravenous and combinations of the various routes. There are seven published reports of abusers heating patches and inhaling the vapors. The Office of the Chief Medical Examiner for the City and County of San Francisco serves a population of approximately 750,000 and this number has remained stable for several decades. In 2002, 1,463 cases came under the jurisdiction of the SFOCME; fentanyl was detected in blood, urine and/or tissue of seven cases, giving an incidence of 0.9 per 100,000 people, a rate of detection nearly twice that of MDMA. The data presented herein is the result of a retrospective analysis of all death investigations carried out by the SFOCME, from January 1, 2002 until December 31, 2002. The median age of decedents was 51.3 years (SD=9.0, range 37-71 years). Decedents were overwhelmingly male (86%), and predominantly white (57%). In 2002, the seven deaths were attributed to bronchopneumonia due to chronic polysubstance abuse (2 cases, 29%), complications of acute and chronic cocaine abuse & pulmonary emphysema (1 case, 14%), pulmonary hemorrhage due to complications of end stage renal disease & hypertension and acute and chronic drug abuse (1 case, 14%), asphyxia due to airway obstruction due to carcinoma on the tongue & polypharmacy (1 case, 14%), hypertensive arteriosclerotic cardiovascular disease & acute subdural hematoma (1 case, 14%) and unknown (1 case, 14%). Cocaine was present in two of the seven cases, as was diazepam and hydrocodone. Other drugs present in the postmortem specimens of these seven cases included alcohol, acetaminophen, amphetamine, chlorpherniramine, ibuprofen, methamphetamine, oxycodone, paroxetine, and trazodone. Fentanyl was extracted from biological specimens using liquid-liquid extraction for alkaline drugs and identified and confirmed/quantified by gas chromatography - mass spectrometry (GC-MS) in the electron impact ionization mode. The mean fentanyl blood concentration was 0.03 ± 0.01lg/mL and the mean fentanyl urine concentration was 0.15± 0.10 lg/mL. In two cases where fentanyl was measured in the liver, the concentrations were 0.04 and 0.19 lg/g, respectively. Fentanyl was finally quantified in cerebrospinal fluid in one case and the concentration was 0.17 lg/mL. For comparison, a case review from another Medical Examiner's Department where a 55-year-old white female died of an acute fentanyl intoxication complicating treatment for chronic pain (with amitriptyline use listed as contributory cause) with a postmortem blood concentration of 0.02 lg/mL. In that case amitriptyline and nortriptyline were present in postmortem blood at concentrations of 1.1 and 1.1 lg/mL, respectively. These findings show that the City and County of San Francisco just like other areas of the country has experienced a rapidly increasing encountering of fentanyl in medical examiner cases. This may suggest that fentanyl is becoming an additional desired opioid similar to oxycodone and methadone. Expectations are that this study will alert the general community on the apparent rise of fentanyl in medical examiner cases and will also aid forensic toxicologists in the interpretation of postmortem fentanyl levels.

Fentanyl, Postmortem, Polysubstance Abuse

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