K31 The Rise of Polypharmacy-Impaired Driving Involving Fentanyl

Nicholas B. Tiscione, MS, Palm Beach County Sheriff's Office, West Palm Beach, FL 33406*

Learning Overview: After attending this presentation, attendees will have increased their competence in the interpretation of and need for fentanyl testing in impaired driving investigations.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by outlining the increasing incidence, polypharmacy, and a case report of fentanyl in impaired driving investigations.

Introduction: A large amount of research has been presented on the impact of the opioid epidemic, and in particular fentanyl, on drug overdoses in death investigations. Conversely, relatively few reports have described the effect of increasing fentanyl use on impaired driving investigations. Herein data from a laboratory in the southeastern United States is presented.

Methods: For all Driving Under the Influence of Drugs (DUID) cases, a volatile analysis was performed by headspace Gas Chromatography (GC) with simultaneous flame ionization and Mass Spectrometry (MS) detection. Screening for other drugs was conducted using a basic extraction with scan GC/MS and an 11-panel Enzyme-Linked Immunosorbent Assay (ELISA) for amphetamines, barbiturates, benzodiazepines, buprenorphine, carisoprodol, cocaine/benzoylecgonine, fentanyl, methamphetamines, opiates, oxycodone/oxymorphone, and cannabinoids. All positive results were confirmed with GC/MS and/or liquid chromatography with tandem mass spectrometry. The ELISA cutoff for fentanyl was 1.0ng/mL prior to 2018 and lowered to 0.5ng/mL in 2018. The limit of quantification for fentanyl was 1.0ng/mL

Results: From 2014 to 2019, 158 out of a total of 580 (27%) drug-positive blood specimens collected for impaired driving investigations were positive for fentanyl. Six cases (4%) were also positive for midazolam, indicating that fentanyl may have been administered post-driving incident by Emergency Medical Services (EMS) in a small number cases. Fentanyl concentrations ranged from 1.0–25ng/mL. A substantial increase in fentanyl cases was observed in 2016 compared to a positivity rate of 7% in 2014 and 10% in 2015. From 2016 to 2019, greater than 30% of the total drug-positive blood specimens contained fentanyl, with 45% in 2018 and 40% in 2019. In drug-impaired driving investigations fentanyl was the most frequently identified drug in 2018 and second most frequently identified drug in 2019. This trend continued into 2020. In the first six months of 2020, fentanyl was the most frequently identified drug; identified in 41% of blood positive impaired driving cases.

Other drugs were identified in the vast majority of the fentanyl cases. From 2014 to 2019, 95% of the fentanyl-positive cases also contained another drug. The most common combinations of other active drugs were other opioids (66%), benzodiazepines (46%), stimulants (30%), Tetrahydrocannabinol (THC) (28%), and ethanol (11%).

Case Report: An officer witnessed a vehicle strike a bicycle. The vehicle swerved into another vehicle well after hitting the bicycle in what the officer described as a delayed action to avoid hitting the cyclist. The driver did not stop after the crashes and had to be pursued. After stopping, the driver was observed to be aggressive and combative. He had extremely constricted pupils, was on-the-nod, and passed out just prior to the second of two blood draws ~5 hours after the crash. The driver was under close observation after the crash and was taken to the hospital after the second blood draw. Naloxone was not administered at the scene. The driver had a recent history of overdose incidents which required responses from EMS. The same paramedics that responded to the crash scene were also called later that day for an overdose at the driver's home after he was released from the hospital.

Whole blood specimens were collected at two different times into evacuated glass gray-stoppered vials containing sodium fluoride and potassium oxalate; ~1 hour after the crash and ~5 hours after the crash. No volatiles were detected in the blood specimen from the first draw. The blood drug analysis identified cocaine at 47ng/mL, Benzoylecgonine (BZE) at 309ng/mL, fentanyl at 35ng/mL, oxycodone <10ng/mL, THC at 3.3ng/mL, hydroxy-THC at 2.5ng/mL, and carboxy-THC at 77ng/mL. No volatiles were detected in the blood specimen from the second draw. The blood drug analysis identified cocaine at 9.4ng/mL, BZE at 277ng/mL, fentanyl at 39ng/mL, THC at 2.8ng/mL, hydroxy-THC at 1.8ng/mL, and carboxy-THC at 54ng/mL.

Discussion/Conclusion: The incidence of fentanyl in impaired driving cases has increased dramatically since 2014. From 2018 to the first six months of 2020, at least 40% of drug-positive blood DUID cases each year have contained fentanyl. Other drugs were identified in the vast majority (95%) of the cases in this jurisdiction. With the potential for significant tolerance, as demonstrated in the presented case report, observed effects may be unexpected. Individuals may maintain consciousness even at levels expected to produce severe respiratory depression and death. Fentanyl impairment can be significant and poses a risk for traffic safety.

Fentanyl, DUID, Polypharmacy

*Presenting Author