K3 Retrospective of Phencyclidine (PCP) Incidence in Cleveland, Ohio, in Driving Under the Influence of Drugs (DUID) and Homicide Cases

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After attending this presentation, attendees will better understand the frequency and demographics of PCP-related cases seen at the Cuyahoga County Medical Examiner's Office (CCMEO) in Cleveland, OH, from 2006 to 2014.

This presentation will impact the forensic science community by informing forensic professionals about a subset of PCP-positive DUID cases and homicides characterized by PCP use prior to death in the City of Cleveland.

Originally developed as a surgical anesthetic in the 1950s, PCP (1-(1-phenycyclohexyl) piperidine) was effective due to its ability to enter patients into trance-like or "dissociative" states; however, due to negative side effects, its use as an anesthetic was discontinued. Today, PCP is a Schedule II drug that causes behavioral responses ranging from hallucinations to disorientation, severe manic states, increased pain threshold, and overall mimicking symptoms of schizophrenia. Research has linked PCP use with generally violent and aggressive behavior including self-injury, aggressiveness toward others, and lack of driving competency. While the PCP-abuse decades of the 1980s and 1990s have waned, Drug Abuse Warning Network (DAWN) data indicates a 400% increase of PCP-related emergency room visits between 2005 and 2011. In this study, the incidence of PCP in Cuyahoga County in both antemortem DUID cases and postmortem cases seen at CCMEO are evaluated.

The cases in which PCP was positively identified by screening blood, urine, or other biological matrices by Enzyme-Multiplied Immunoassay Technique (EMIT), **Enzyme-Linked Immuno-Sorbent Assay (**ELISA), or gas chromatography (with Nitrogen–Phosphorus Detector (NPD)) and confirmed by Gas Chromatography/Mass Spectrometry (GC/MS) between 2006 and 2014, were gathered and analyzed by means of a statistical package included in CCMEO's Pathways© program. Testing sensitivity levels were consistent across testing methodologies during the period. Antemortem samples were submitted by local police departments for cases of DUID in which the individual was stopped for erratic driving. Postmortem cases involving PCP-positive toxicology results were assessed for cause of death, decedent demographics, location of death, and polysubstance abuse.

Out of the total PCP-positive cases for the nine-year period, 68.50% were DUID cases and 31.50% were postmortem cases. Specifically, the incidence of PCP-positive DUID cases has increased five-fold over the past nine years with 1.04% PCP-positive cases in 2006 compared to 5.42% for 2014. Within these DUID cases, the blood PCP concentration range was 0.01mg/L -0.18mg/L with a median value of 0.05mg/L. Polysubstance abuse occurred in 85.4% of the DUID cases. The most co-consumed drugs of interest were cannabinoids (THC), present in 40.00% of the DUID cases, followed by ethanol in 21.95% of the cases, and cocaine in 12.68% the cases.

Postmortem cases positive for PCP were analyzed for cause of death. Homicides made up 47.19% of the total postmortem PCP cases, followed by other causes of death such as overdoses from acute intoxication of PCP or from other drugs such as heroin in 17.98% of these cases and suicides in 12.36% of these cases. The most significant finding was the large number of homicides involving PCP-positive decedents. Relative to the total homicide cases seen at CCMEO, on average, PCP positive homicides make up 3.31%, with a maximum of 6.99% observed in 2012. Within the PCP-positive homicides, 80.48% involved Black males, 7.14% involved Black females, and 2.38% involved White males. Of the PCP-positive homicides, 85.71% were single with a median age of 31 years old; 86.49% of these homicides occurred within the City of Cleveland and the other 13.51% occurred in the suburbs. The blood PCP concentration range was 0.05mg/L 0.5mg/L with a median value of 0.16mg/L. Further toxicological analysis shows that 73.1% of the cases also tested positive for other drugs of interest. Ethanol was present in 53.66% of the homicide cases, followed by THC at 46.34%, and cocaine at 14.63%.

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Post-evaluation of the circumstances of PCP incidence in Cuyahoga County has revealed a subset of homicide decedents that have consumed PCP in addition to other drugs such as marijuana and/or cocaine prior to death. PCP-related DUID cases also rose in this nine-year period, which includes an increase in cases from the Cleveland Police Department starting in 2009. While the relationship of PCP use and aggressive or reckless behavior is not well defined, this epidemiological study shows the association between PCP usage and violent crimes such as homicide and dangerous driving. Perhaps this data can shed light on PCP usage in Cuyahoga County, raising awareness about the association between PCP use, homicide incidence, and DUIDs.

Phencyclidine, Homicides, DUID