



K36 Phencyclidine (PCP) in San Francisco: A Review of 50 Postmortem and Human Performance Toxicology Cases Between 1997 and 2013

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After attending this presentation, attendees will understand the frequency of PCP detection as well as the concentration ranges of PCP in Postmortem (PM) and Human Performance (HP) cases in the City and County of San Francisco.

This presentation will impact the forensic science community by expanding the existing body of scientific knowledge of demographic characteristics in PCP-positive PM cases, Driving Under the Influence (DUI) and other police cases (including toxicologic findings in these cases), commonly analyzed specimens, and ranges of blood concentrations typically encountered in such cases.

The Forensic Laboratory Division (FLD) of the Office of the Chief Medical Examiner (OCME) analyzes evidence from postmortem and human performance cases on behalf of 14 law enforcement agencies operating within the City and County of San Francisco. For PCP, commercially-available Enzyme Linked Immunosorbent Assay (ELISA) kits are used to screen blood (cardiac/central blood in PM cases, venous blood in HP cases) and/or urine received by the FLD. The ELISA cutoffs for blood and urine PCP are 10ng/mL and 50ng/mL, respectively. Following a positive ELISA screen, confirmation and/or quantitation is performed in blood (peripheral blood in PM cases; a new aliquot of venous blood in human performance cases) and/or a fresh aliquot of urine by Gas Chromatography/Mass Spectrometry (GC/MS) with a Limit Of Quantitation (LOQ) of 0.01mg/L. The assay uses tripeleamine as Internal Standard (IS). The observed retention times are: 8.16min (PCP) and 9.96min (IS). The Target (underlined) and Qualifier ions (m/z) for PCP are 91, 200, 242 and for IS are 58, 91, 185, and 197.

In order to determine PM and HP cases involving PCP in San Francisco over the period of interest, the in-house database was manually interrogated.

Twenty HP cases were confirmed to have PCP in blood, in which subjects averaged 42.4 years of age (range: 20–57 years), were predominantly male (n=20; 75%), with a racial distribution of Hispanic (50%), White (30%), Other (5%), Unknown (5%), and Not Available (10%). The PCP blood concentrations in these cases were (mg/L): mean 0.06 (median 0.05, range 0.01–0.11, standard deviation 0.03). PCP was encountered by itself in seven of the 20 cases and in combination with other psychoactive compounds in the remaining 13 cases. The most commonly encountered drugs detected in PCP-positive cases were amphetamines (n=5), cocaine/benzoylcgonine (n=3), ethanol (n=2), methadone (n=2), and THC (n=2).

In addition, there were 30 PM cases involving PCP, 24 of which had peripheral blood concentrations. Thirteen of the 24 also had PCP confirmed in urine. Another four cases had PCP only in urine, one had PCP in cardiac/central blood, and one had PCP measured in liver. Decedents averaged 42.6 years of age (range: 21–62 years), were predominantly male (n=30; 83%), with a racial distribution of White (50%), White Hispanic (40%), Black (7%), and Native American (3%). The manners of death were: 16 accidents, six suicides, five natural deaths, two homicides, and one undetermined. The PCP peripheral blood concentrations (n=24) were: mean 0.23, median 0.13, range 0.01–0.59, standard deviation 0.19. PCP was encountered by itself in only two of the 24 cases. In all other cases, it was present in combination with other psychoactive drugs: morphine/codeine (n=10), cocaine (n=9), ethanol (n=9), amphetamines (n=6), and methadone (n=5).

This presentation offers valuable information on the demographic distribution of PCP users and decedents in the City and County of San Francisco and offers PCP reference blood concentrations. The San Francisco data suggests that PCP remains a popular recreational drug found in many types of cases. These data show that 35% of PCP-positive living subjects apprehended for DUI and other related offenses were more likely to have PCP on its own. In comparison, only 7% of PCP-positive decedents had PCP by itself, suggesting PCP serves as only one compound of a typical poly-substance death involving PCP. Comparison of mean blood concentrations indicates statistically-significant differences in blood concentrations with PCP-positive decedents having concentrations averaging more than 3.5 times higher than those of living subjects. The data presented is useful to forensic toxicologists, medical examiners, pathologists, coroners, attorneys, as well as other law enforcement agents, who need to understand and interpret PCP concentrations in HP and PM toxicologic specimens, for the purpose of their medicolegal investigations.

Phencyclidine (PCP), Postmortem Toxicology, Human Performance Toxicology