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## Phencyclidine-Related Deaths in Los Angeles County, 1976

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The current widespread use of the illicit drug phencyclidine (PCP), more commonly known as "angel dust" by the "street people," elicits not only a health hazard but also criminality through violence and public disturbance. Files of the Los Angeles County Sheriff's Crime Laboratory show that 25.3% of the 17 000 drug possession cases in 1976 involved PCP. Since the drug can be readily prepared clandestinely, it has been substituted for tetrahydrocannabinol and mescaline for illicit distribution. Jain et al [1] reported that in the analysis of urine specimens from probationers in Los Angeles County there was an increase in the PCP-positive samples from 36 to 145 for the months of January and February from 1975 to 1976. In 1977, there were 435 positives in these two months. The consequence of this street activity was that approximately 50 PCP cases per month were admitted on an emergency basis to the Los Angeles County General Hospital in 1976.

Deaths resulting from the use of PCP, directly or indirectly, were not a common observation in this office until 1976 when 3 deaths caused primarily by acute PCP intoxication and 13 deaths from behavioral toxicity from PCP were reported. In many of these cases, PCP incited disordered and agitated mental states in individuals which, in turn, led them into perilous situations. In two cases, the decedents went swimming with their companions and drowned while under the influence of PCP. An unusual but pleasant sensation is experienced by PCP users while swimming; however, the drug depresses the sensory and muscular control of these swimmers [2]. Another died in a sauna bath while under PCP intoxication. Examples of disorientation, confusion, diminished fear, and aggressive and threatening behaviors attributed to PCP use are illustrated in the following case histories. Included is a case in which PCP was used to commit suicide.

### **Selected Case Histories**

#### *Case 15083*

A 26-year-old male was reported to have smoked five or six "angel dust" cigarettes, in rapid succession, and to have been smoking prior to this administration. History indicated that he had been using "angel dust" for several months. Suddenly he jumped out the second-story bathroom window of an apartment house, landing on a grape stake

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fence before striking the ground. He removed all of his clothing at this time and ran up some stairs of the apartment building onto a balcony. He then jumped off the balcony onto the concrete below. When the ambulance arrived he was dead. On the day before his death the decedent had been taken to a local hospital by the police for irrational behavior and he had been released that same day.

*Case 15177*

A 23-year-old male was discovered inside a secured fenced parking lot of a baking company. The security guard approached the intruder and asked what he was doing there. The intruder replied that he was stronger than God and made some incoherent remarks. The guard noted that he was "spaced out." The intruder then attempted to reach for the guard's revolver. The guard kept his distance from the decedent, pulled his weapon, and fired one round in the air as a warning. He then fired another round into the air. The decedent kept laughing and stated that he was stronger than God. He lunged at the guard who in turn fired once into the intruder's chest. The intruder rose and attacked the guard. The latter fired again and the intruder fell to the ground dead.

*Case 8548*

The decedent joined her boyfriend in smoking "angel dust" and marihuana in his abode. The male companion told the police that while he was under the influence of the drug he felt like the "Master," or a god. Then he imagined a cord tightening around his neck and proceeded to strangle the girl with the cord from the bathrobe he was wearing.

*Case 14272*

A 27-year-old male was observed indiscriminately breaking shop windows along Hollywood Boulevard with a long-handled chopping ax. A patrol unit was summoned by a citizen. The principal was told to put down the ax but instead he replied by swinging it at one of the officers. The officer promptly fired a single 00-buckshot shell from a shotgun into the assailant.

*Case 15472*

This case was of particular interest inasmuch as a suicide note was found on the deathbed of the decedent, a 20-year-old male. The day prior to his death he had been observed by his companions to be smoking a large quantity of alleged marihuana and consuming an unknown amount of "cannabinol" pills. Toxicological analysis revealed an unusually high concentration of PCP in the decedent's blood and liver (see Table 1). No other common drug was detected in the routine laboratory screen.

TABLE 1—*Blood and liver concentrations in fatalities caused by phencyclidine.*<sup>a</sup>

Case	Mode	Sex	Age, years	Blood, $\mu\text{g}/\text{ml}$	Liver $\mu\text{g}/\text{g}$
15472	suicide	m	20	19.0	32.7
15273	accident	m	28	4.0	6.3
13438	accident	m	24	2.0	1.7

<sup>a</sup>No other drug, including alcohol, detected.

## Methods

Phencyclidine is determined in blood and liver specimens by an analytical procedure similar to that described by Reynolds [3]. Five millilitres of blood or 50% tissue slurry is doubly extracted, initially with butyl chloride and then with chloroform. SKF-525-A (proadifen) is used as an internal standard. The final extract is gas chromatographed on OV-17 at 210°C. This laboratory employs a mass spectrometer interfaced with a gas chromatograph and data system for confirmation.

## Discussion

The analytical results are shown in Tables 1 and 2. The low concentrations of PCP in blood confirm an observation [4] that it is cleared from the blood and distributed rapidly to other organs of the body. This finding is attributed to the lipophilic nature of PCP.

The blood concentrations in accidental overdose deaths were 2.0 and 4.0  $\mu\text{g}/\text{ml}$ , while in a single case reported as a suicide the blood level was 19.0  $\mu\text{g}/\text{ml}$ . The liver concentrations were 1.7 and 6.3  $\mu\text{g}/\text{g}$  in the accidental overdose cases and 32.7  $\mu\text{g}/\text{g}$  in the suicidal overdose case. The blood to liver ratio ranged from 0.9 to 1.7 in these three cases.

The blood concentration range in behavioral toxicity listed in Table 2 was somewhat lower than that in overdose cases, the concentration range being 0.05 to 1.0  $\mu\text{g}/\text{ml}$ . These figures were comparable with the values presented by Pearce [5] for blood PCP in nonfatal intoxication cases, which ranged from 0.007 to 0.125  $\mu\text{g}/\text{ml}$ , and by Reynolds [3], whose values ranged from trace to 1.06  $\mu\text{g}/\text{ml}$  in postmortem cases with causes other than overdose.

In the cases studied here the decedents did not use PCP with other drugs, except possibly marihuana, and therefore our laboratory was able to study the blood levels of PCP to evaluate fatal toxicity.

Burns and Lerner [2] suggested in their review of PCP fatalities that the concentration of 2.0 to 2.5  $\mu\text{g}/\text{ml}$  and greater of PCP in blood is probably uniformly fatal. Their suggested range appears to be minimal for lethal concentrations in blood. Reed et al [6], however, reported a fatality caused by PCP with a concentration of 0.3  $\mu\text{g}/\text{ml}$  in blood of a 19-year-old male found dead in bed. The liver concentration was also relatively low, 0.9  $\mu\text{g}/\text{g}$ . In our Case 10464, the concentration of PCP in the blood was also 0.3  $\mu\text{g}/\text{ml}$  and in the liver, 1.4  $\mu\text{g}/\text{ml}$ . Since the individual died from a combination of heat prostration and drug effect, resulting in cardiovascular collapse, a correlation was not entirely possible.

This paper reports a case in which an individual committed suicide by taking an overdose of PCP. While no PCP or PCP-impregnated cigarettes could be found at the site of death, nor did the decedent indicate in his suicide note the means that he would use to terminate his life, chemical analyses, however, showed that he took a massive dose before dying. This case appears to be the first reported suicide in which PCP was used as a poison.

It is apparent that the PCP toxicity levels in blood should be considered as being somewhat lower than most drugs used as analgesics and anesthetics that are commonly abused. Where history suggests that the decedent was in coma for any length of time, special attention is given to liver analysis since PCP rapidly disappears from the blood. A compilation of data on PCP levels in liver, accompanied with possible survival times, should be of great importance in postmortem investigations in PCP fatalities. The general postmortem observations in drug-involved deaths are those of pulmonary edema and acute passive congestion; in the PCP-induced deaths listed in Table 1, there was no autopsy finding to indicate specifically the involvement of PCP.

Our case illustrations show how behavioral responses of individuals to moderately high

TABLE 2.—Phencyclidine concentrations in fatalities from other causes.

Case	Sex	Age, years	Blood PCP, μg/ml	Other Drugs, μg/ml	Mode	Cause
14046	m	19	0.10	...	suicide	stab wound of chest; decedent ran kitchen knife into chest against the wall
15838	m	24	0.05	...	suicide	gunshot wound; decedent shot wife and killed himself
01294	m	38	0.90	blood diphenhydramine, 0.01	homicide	gunshot wound; two suspects entered apartment dwelling and tied up decedent
08548	f	17	0.40	...	homicide	manually strangled by boyfriend (see case report)
13063	m	31	0.50	bile morphine, 0.10	homicide	gunshot wound; decedent forced entry into a rectory and assaulted church housekeeper; when confronted by police he aimed a weapon and was shot
14272	m	27	0.20	...	homicide	gunshot wound (see case history)
15117	m	23	0.20	...	homicide	gunshot wound (see case history)
15739	m	39	0.60	...	homicide	gunshot wound; decedent attempted to rape daughter and was shot by common-law wife
03942	f	24	0.60	...	accident	drowning; decedent was unable to stay afloat in ocean water
05016	m	20	0.30	...	accident	drowning and acute PCP intoxication; decedent went swimming while reportedly "high"
10464	m	18	0.30	...	accident	decedent was discovered dead in a sauna bathhouse which he frequented; in his possession were plant substances dusted with PCP; immediate cause of death was cardiovascular collapse
13477	m	26	0.60	...	accident	decedent was removed from a restaurant for causing a disturbance; while being arraigned in jail, he removed all his clothing, except for a T-shirt, and became combative; en route to jail, the decedent appeared to fall asleep, but was dead on arrival; postmortem studies revealed massive intravascular sickling (sickle cell disorder) in the organs
15083	m	26	1.00	...	accident	multiple injuries; jumped out of window onto sidewalk; body naked (see case history)

doses of PCP cause serious problems of a medicolegal nature. There are examples of aggressive and threatening behaviors concomitant with schizophrenic grandiosity of imagining oneself as a fearless "God" or "The Master." In resisting arrests, individuals intoxicated with PCP have attacked law enforcement officers who resorted to shooting in self-defense. Cohen [7] indicated that emotional outbursts and assaultiveness may be manifested even in the interval between PCP trips.

Since these striking behaviors are not shown in all of the PCP-related cases studied in our facilities, we need to understand whether these psychoses are dose-related or are induced in individuals who are predisposed. Fauman et al [8] suggest that phencyclidine psychoses seem to require a combination of sufficient drug and deficient ego strength. Despite the devastating effect of PCP on people who have experimented with it, its popularity grows.

### Summary

Concentrations of phencyclidine in blood and liver are presented in five fatal cases occurring in Los Angeles County in 1976. Eleven other deaths in which phencyclidine contributed to death are described; acute psychotic reactions were observed in some of these cases. Two cases involved the drowning of individuals whose swimming capabilities may have been diminished from the effects of PCP. One case is presented in which a 20-year-old male took a massive overdose of phencyclidine for suicidal purposes.

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