



The Toxic NOSE (Novel Opioid and Stimulant Exposure)

Report #2 from Toxic's Rapid Response Program for Emerging Drugs of Abuse

June 28, 2021

PCP and TCP: An Old Drug with a New Twist

Introduction

Phencyclidine (PCP) is an arylcyclohexamine developed in the 1920's as an alternate anesthetic medication. Significant neuropsychiatric side effects curbed its therapeutic role but fueled its appeal as a recreational drug (street names for PCP include Angel Dust, PeaCe Pill, Hog). PCP's popularity peaked in the late 1970's. In 1978, the National Institute of Drug Abuse (NIDA) found that 13.9% of young adults between 18-25 years old had reported PCP use.¹ After being classified as a Schedule II drug in 1978, PCP use decreased and then plateaued (2.5% of US population reporting lifetime use).² PCP has also been found as an adulterant in other recreational drugs, historically contaminating marijuana; up to 30 analogs of PCP have been reported including PCE (eticyclidine), 3-MeO-PCP (methoxydine), PHP (rolicyclidine) and TCP (tenocyclidine).³

Though use of PCP has remained relatively low, its popularity in certain US cities (Washington DC) persisted, and more recently clusters of increased PCP use have been seen in others (Los Angeles, Philadelphia, New Haven).⁴ Interestingly, increased emergency department presentations have recently been reported in PCP intoxicated patients.² Common clinical effects of PCP use include hypertension, tachycardia, nystagmus, and neuropsychiatric effects including severe agitation and violence (effects can vary by dose and route of intake).³ PCP analogs are reported to have similar clinical effects, however serious outcomes including death have been reported.^{7,8} It is unclear if increased emergency department visits are related to newer PCP analogs, contaminants, or other factors.

The Toxic Novel Opioid Stimulant Exposures (NOSE) Reports

As a project of the Opioid Response Network (ORN), the American College of Medical Toxicology (ACMT) is using the enhanced sentinel detector field to identify and report on novel and emerging opioid and stimulant exposures reported in Toxic every quarter over a 2-year period.

The goal of this project is to disseminate this novel information to the medical toxicology community as well as the ORN as part of a Rapid Response program.

A cluster of PCP cases, including the PCP analog TCP, was detected in the Toxicology Investigators Consortium (Toxic) Core Registry Novel Opioid and Stimulant Exposure (NOSE) indicator in early 2021 in Phoenix, Arizona. This unusual finding prompted a deeper look at PCP and PCP analog cases in the Toxic Registry.

A Case Cluster and Toxic Data

Case Cluster

In the first four months of 2021, five cases of PCP or its analogs were reported from this single location, four of which occurred in a three-week span of late March to early April. This represents a departure from the previous year during which only one PCP case was reported nationally to the Toxic Core Registry during the same time period. Case details are presented in Table 1.

All five cases occurred in men between the ages of 38-65. Four were non-Hispanic African American men. All patients presented with agitation. Metabolic acidosis (carbon dioxide <20) occurred in 4/5, mild acute kidney injury (creatinine >1.5) in 2/5, and mild rhabdomyolysis (creatinine phosphokinase >355) in 4/5. Tachycardia and hypertension were often present, though mild and below the Registry threshold for abnormal vital signs (heart rate >140, and systolic blood pressure >200 and/or diastolic blood pressure >120). Neurologic findings improved rapidly (<24 hours) in all cases except one. This patient was intubated and developed an aspiration pneumonia complicating his clinical course. The PCP analog TCP was detected along with PCP in 2/5 cases, and cocaine was a common coingestant.

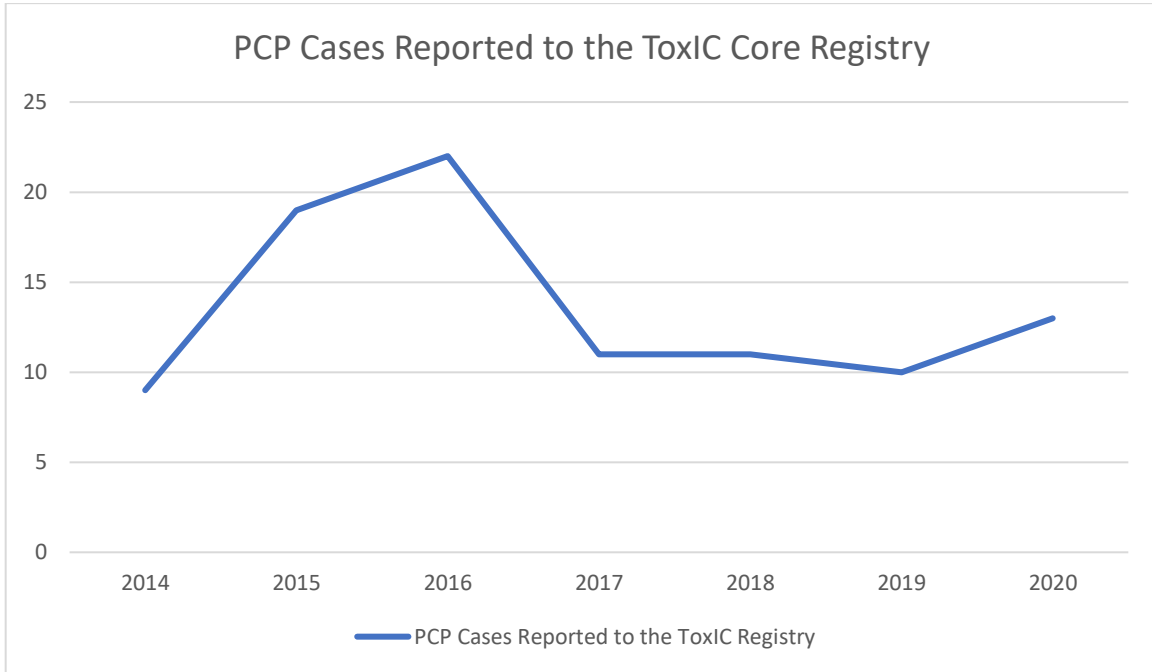
Table 1: Arizona PCP Case Cluster 2021*

	Case 1	Case 2	Case 3	Case 4	Case 5
Age (yrs)	53	38	42	39	65
Sex	M	M	M	M	M
Race	African American	Caucasian	African American	African American	African American
Hispanic Ethnicity	No	No	No	Yes	No
Agitation	Yes	Yes	Yes	Yes	Yes
Carbon dioxide (mmol/L)	8	6	24	17	13
Creatinine (mg/dL)	1.6	1.4	1.0	0.9	2.4
Creatine phosphokinase (U/L)	808	285	721	709	1700
Initial heart rate (bpm)	110	140	87	140	91
Initial blood pressure (mm Hg)	173/119	129/75	132/77	159/96	150/101
Pertinent comprehensive toxicological lab results	<ul style="list-style-type: none"> - Cocaine - Levamisole - PCP - 1-[1(2-thienyl) cyclohexyl] piperidine (TCP) 	Not sent	<ul style="list-style-type: none"> - Acetaminophen - Cocaine - Diphenhydramine - Levamisole - PCP 	Not sent	<ul style="list-style-type: none"> - Cocaine - PCP - 1-[1(2-thienyl) cyclohexyl] piperidine (TCP)

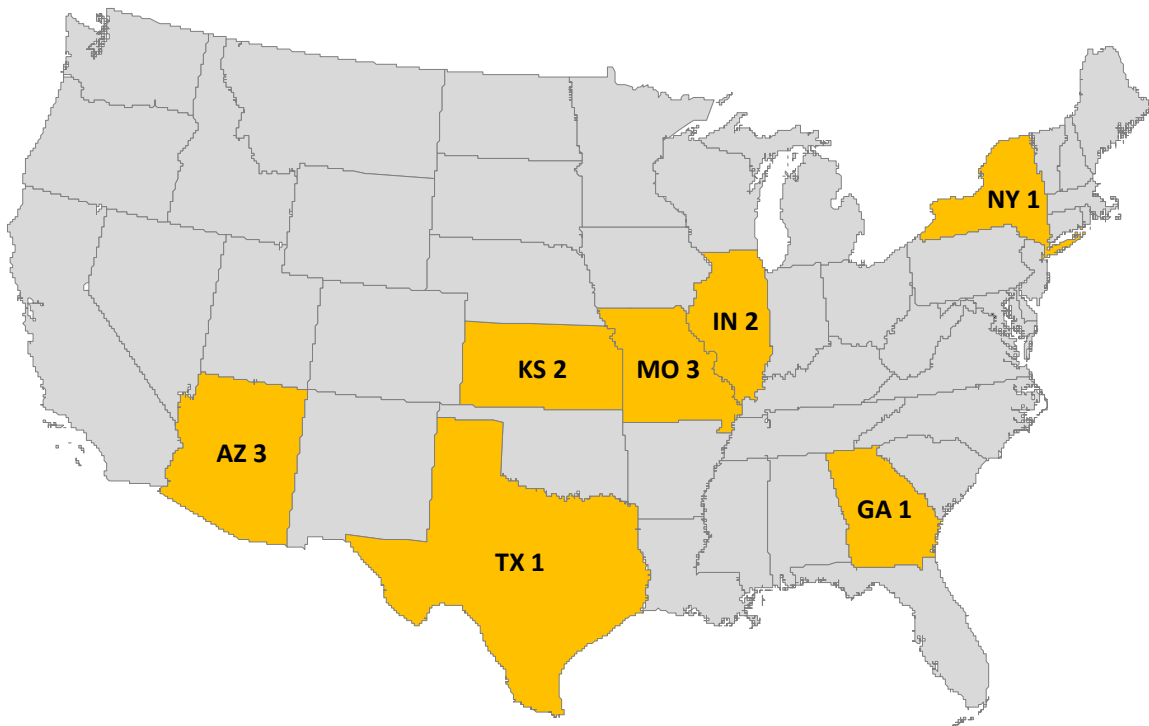
* Abnormal lab values and PCP analog in red

Toxic Data

A review of Toxic data from 2014-2020 shows an overall stable trend in reported PCP cases since 2014 with a spike from 2015-2016.



In 2020, 13 cases in seven different US states were reported to the Toxic Registry.



Taking a closer look at 2020 data, the average age of patients with reported PCP exposure was 33 years (range 2-68). Males comprised 69% of cases. See Table 2 for demographics.

Table 2: Demographics of PCP Cases Reported to the ToxIC Registry 2020

Demographics	N (%)
Age (average in yrs)	33
Men	9 (69.2%)
Race	
African American	11 (84.6%)
American Indian	1 (7.7%)
Unknown	1 (7.7%)
Hispanic Ethnicity	0 (0%)
Total Cases	13

The majority of cases in 2020 reported PCP use to be recreational (12, 92.3%); there was only 1 case (7.7%) of suicidal intent. This case involved a polysubstance ingestion of ethanol, marijuana, and PCP. Polysubstance ingestions were common, representing 53.9% (7) of cases. Coingestants included sympathomimetic substances, cough and cold medications, ethanol, and other psychoactive substances.

Hypertension (systolic blood pressure >200 and/or diastolic blood pressure >120) was present in 3 cases (23.1%) and tachycardia (heart rate >140) was present in 4 cases (30.8%). Major cardiac events were rare (1 case of QT prolongation >500ms on electrocardiogram). Central nervous system (CNS) findings, however, were reported in 100% of cases. Agitation (6, 46.2%) and CNS depression (8, 61.5%) were reported most frequently, and there was 1 (7.7%) reported seizure. Metabolic acidosis (pH <7.2) was reported in 1 case (7.7%) and rhabdomyolysis (creatinine phosphokinase >1000) in 2 cases (15.4%). There were no cases of acute kidney injury (creatinine >2.0).

Toxicologic treatment was required in 8/13 (61.5%) cases. Benzodiazepines (7, 53.8%) were the most common treatment administered. No deaths were reported.

Discussion

Large case series of PCP intoxicated patients are uncommon in contemporary literature, however the most recent series by Dominici et al in 2015 does reflect similar findings to ToxIC's 2020 data.⁵ Demographic similarities include a population largely of males with a mean age in the early 30's and a high incidence of coingestants. Dominici et al reported tachycardia to be rare (1%) but hypertension was more common at 47%.⁵ A large case series from 1980 included 1,000 patients and reported both hypertension and tachycardia to be common (43% and 30% respectively), however with mild tachycardia (heart rate <140) in all cases, similar to the ToxIC

2020 data.⁶ Reports of agitation (34%) are also similar to ToxIC findings.⁶ Life threatening presentations or severe vital sign abnormalities were rare in all reports.^{5,6}

The 2021 case cluster detected by the ToxIC Core Registry NOSE indicator was similar to previously reported PCP cases, with the exception of a high presence of metabolic acidosis and acute kidney injury. Notable in this series, the rare analog TCP was detected in two of the five cases in addition to PCP, and cocaine was detected in 60% of cases. It is unknown if PCP and TCP were adulterants to cocaine or another illicit substance versus being the primary substances of exposure.

There is a paucity of literature on PCP analogs, and the potential for more severe clinical presentations remains. Fatal intoxications associated with one PCP analog, MeO-PCP (methoxydine), are reported.^{7,8}

Conclusion

PCP cases remain relatively uncommon in the ToxIC Core Registry however clusters, including those involving an uncommon PCP analog, TCP, have been identified. These cases should remind clinicians of the continued use of PCP in certain US cities and of its classic clinical presentation. In addition, clinicians should be mindful of potential outbreaks of PCP analogs

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About the *Opioid Response Network (ORN)*:

ORN provides free, localized training and education for states, communities, organizations and individuals in the prevention, treatment and recovery of opioid use disorders and stimulant use. Learn more and submit a request at www.OpioidResponseNetwork.org.

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