On Behalf of the Toxicology Investigators Consortium (ToxIC). A Five-Year Analysis of the Toxicology Investigator's Consortium (ToxIC) Core Registry: Exposure Differences in Patients that Identified as Transgender vs. Cisgender

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significantly higher rates of neurotoxicity in SC presentations: they were more likely to be drowsy (49% vs 17%; $p < 0$ .01) or in a coma (3.7% vs 1.9%; $p < 0.01$), agitated (41% vs 22%; $p < 0.01$), to have seizures (8.1% vs 2.6%; $p < 0.01$) and to be psychotic (16% vs 13%; $p = 0.034$). There was no difference in the proportion with arrhythmias between the SC and cannabis presentations (0.8% vs 1.7%; $p = 0.252$), although they had a significantly lower mean heart rate (89 vs 98; p <0.01), systolic blood pressure (122 vs 128; $p < 0.01$) and there were fewer reports of palpitations (5.2% vs 20%; $p < 0.01$) and chest pain (5.2% vs 10%; $p < 0.01$). There was no difference between rates of hyperthermia between groups (SC 0.3% vs cannabis 0.8%; $p = 0.552$). SC patients were more likely to have a psychiatric admission (15% vs 8%; $p < 0.01$), but there was no difference in the proportions admitted to critical care (1.6% vs 1.1%; $p = 0.39$) or in length of stay in hospital (15 h v 17 h; $p = 0.595$).

Conclusions: This retrospective cohort study of over 3000 EuroDEN Plus patients with either lone cannabis or SC toxicity, has shown that neurotoxicity is more common in those with lone SC compared to lone cannabis toxicity, although some markers of cardiovascular toxicity are less common. Further work is needed to identify whether only certain or all SCs are associated with neurotoxicity, or if the frequency of neurotoxicity has changed over time as the chemistry of the SCs has evolved.

KEYWORDS Cannabis; synthetic cannabinoids; acute toxicity

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51. Accidental carboprost injection in a neonate

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Background: Carboprost is a 15-methyl analogue of prostaglandin F2α. It is used to control postpartum hemorrhage when other interventions have failed. Given the high-stress nature of the delivery room, there is a possibility for inadvertent administration of maternal medications to the neonate. We describe a rare case of accidental administration of carboprost to a newborn in the delivery room.

Case report: A 4.15 kg male was born at 39 weeks' gestation by repeat c-section to a multipara woman who had limited prenatal care. The patient was well at birth with Apgar score of 8 at 1 min and 8 at 5 min, with points off for tone and color. Standard postnatal care was initiated. The child received vitamin K IM injection, and then, instead of Hepatitis B vaccine, received 125 mcg Hemabate (carboprost tromethamine) IM. Within 1 h, the patient developed intermittent tachycardia, up to 220s. He was described as "uncomfortable" in appearance. No seizures were reported, but he was noted to have hyperreflexia. He developed hyperthermia to 38.3 °C. The patient demonstrated periods of desaturation down to the 70s%, concurrent with periods of apnea versus periodic breathing. No bronchospasm was noted. The patient was placed on CPAP. The patient was transported to a NICU at a larger center and was transitioned to NIMV. On arrival about 7 h after the exposure, the hyperthermia had resolved. The patient had become hypothermic at 35.2 °C and was actively rewarmed. Vital signs were otherwise unremarkable. He was described as hypotonic and non-vigorous with minimal suck and gag reflexes. Antibiotics were given for possible sepsis. Over the next 26 h, the patient improved, no longer needed NIMV, and was tolerating bottle feeds. The patient was cleared at 48 h, after blood cultures were negative.

Discussion: Inadvertent administration of maternal medications to the newborn in the delivery room are known to occur. However, inadvertent administration of carboprost is rarely documented. To our knowledge, this is the lowest dose documented to cause symptoms, at 30.2 mcg/kg. Prior cases document symptoms at 46.3 mcg/kg and 73.5 mcg/kg. Similar to prior cases, this patient demonstrated hyperthermia and abnormal tone. Hyperthermia is also reported in adults receiving carboprost therapeutically. Also similar to prior cases, the patient developed respiratory perturbations. In this case, these were managed by non-invasive positive pressure ventilation. In a prior case report, the question was raised as to whether the respiratory effect was from the benzyl alcohol diluent. However, there would have been less than 5 mg in this dose, and prior papers suggest the dose needs to be 99–234 mg/kg. Treatment is supportive care. In the cases documented in the literature, recovery occurred in 18–26 h – similar to the case documented here.

Conclusions: Toxicologists should be aware of this potential medication error, and be able to describe potential effects to the primary teams. Management is primarily supportive care. The delivery room remains a target for medication safety interventions.

KEYWORDS Carboprost; medication error; newborn

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52. A five-year analysis of the Toxicology Investigators Consortium (ToxIC) core registry: descriptive differences among patients who identified as transgender compared to cisgender, 2017–2021

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Background: Persons who identify as transgender are at increased risk for a number of negative health outcomes, including substance use and suicide. Healthy People 2030 includes goals for reducing substance use and suicidal thoughts among persons who identify as transgender. We explored medical toxicology consultations from the Toxicology Investigators Consortium (ToxIC) Registry by gender identity (i.e., persons who identify as transgender/gender nonconforming, with a gender identity different than sex assigned at birth, [PWITG], compared to persons who identify as cisgender, with a gender identity matching sex assigned at birth [PWICG]). This data set captures information on hospital patients who had a consult requested by a treating physician for additional patient management related to suspected substance exposures, in many cases presenting with an overdose.

Methods: We conducted a descriptive analysis of consultations involving drug exposures where the patient knowingly ingested

the substance (rather than accidental ingestions) in the ToxIC Registry from 2017 to 2021. Information on demographics, reason for drug exposure, drug class used (e.g., opioids, antidepressants), and clinical presentation was assessed by gender identity. All analyses were performed in SAS 9.4.

Results: A total of 19,606 toxicology consultations were identified; 19,336 identified as cisgender, and 270 identified as transgender. Among cases involving PWITG, 166 (61.5%) were female-to-male, 69 (25.6%) were male-to-female, and 33 (12.2%) were gender nonconforming. The mean age for PWITG was 20 years (median =16) and 31 years (median =26) for PWICG. PWITG had a higher proportion of self-harm (87.8%) as compared to PWICG (63.1%). PWICG reported a higher proportion of misuse of prescription or OTC drugs/illicit substance use than PWITG (6.7%). PWITG had higher proportions of antidepressant exposure (34.1%) compared to PWICG (21.3%), while PWICG had higher proportions of opioid exposures (14.9%) compared to PWITG (4.4%). Other notable differences in drug exposures included higher proportions of analgesic in PWITG (38.9%) compared to PWICG (30.7%) as well as higher proportions of anticholinergic or antihistamine exposure in PWITG (21.5%) compared to PWICG (13.3%). Lower proportions of sedative hypnotic or muscle relaxer exposure were seen in PWITG (8.1%) compared to PWICG (14.5%). PWITG presented proportionally more often with tachycardia (15.6%) compared to PWICG (12.9%). Over half (51.1%) of PWITG, and 60.9% of PWICG presented with a nervous system abnormality, the most common being coma or central nervous system (CNS) depression, where PWITG had a lower proportion (23.7%) compared to PWICG (35.9%).

Conclusions: We identified both similar and different drug consultations among patients who identified as transgender and those who identified as cisgender. Notably, PWITG had a higher proportion of exhibited drug use for self-harm than PWICG. This could be a result of both increased risk for suicide among PWITG generally and increased nonfatal suicide attempt risk among younger as opposed to older age groups. Further research examining drug overdoses among PWITG may help prevent overdose and inform best care practices for this population. Screening for suicide risk and referral to both substance use and mental health services could simultaneously help prevent intentional and unintentional overdose.

KEYWORDS Transgender vs. cisgender; drug exposures; overdose

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53. Brain death mimickers: a retrospective review of poisoned patients considered for organ donation

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Background: Brain death is the irreversible loss of all brain and brainstem functions, yet the diagnosis of brain death can be complicated by drug overdose. Because symptoms of overdose are reversible, patients who have symptoms that mimic brain death should not be declared brain dead unless the ingested drug is no longer exhibiting effects. Several drugs are known to cause symptoms similar to brain death including alcohol, barbiturates, baclofen, bupropion, antiepileptics, tricyclic antidepressants, organophosphates, zolpidem, and succinylcholine. In this study, we reviewed drugs involved in patients who overdosed and had severe enough illness to trigger consultation of the local organ procurement organization (OPO). The goal was to identify additional drugs that may confound the brain death diagnosis.

Methods: This was a retrospective chart review of patients at a single university hospital who were treated for drug overdose and had symptoms that prompted an OPO consult. Patients were identified using a query of the electronic health record, EPIC. Search terms include patients with an OPO consult in conjunction with an ICD code for drug overdose (ICD 9 690–989 and ICD 10 T36–65). Patients were included if they had a known/suspected toxic ingestion, an OPO consultation, and were intubated during their hospital stay. Patients were excluded if no toxic ingestion was suspect, toxic ingestion was isolated to acetaminophen induced liver failure, they were not intubated during their hospital stay, there was structural brain damage found on imaging, or the patient suffered from cardiac arrest on arrival. The following data were collected from the chart: age, gender, number of days in the hospital, number of days from overdose to OPO consultation, home medications, drugs implicated in overdose, number of days intubated, sedatives and/or opioids used during hospital stay, results from head CT/MRI/brain perfusion scan/EEG if performed. If brain death exam was performed, details were recorded. Ultimate outcome of the patient was also recorded.

Results: A total of 516 patient charts were identified and after charts review 10 patients meet inclusion criteria. The most common reason for exclusion was because no toxic ingestion was suspected upon review of patient chart. Patient age ranged from 23 to 73 years with 5 males and 5 females. No patients underwent official brain death testing. One patient died and did not undergo organ donation. The remaining patients lived with two discharged to psychiatry, six discharged home, and one discharged to prison. Drugs thought to be implicated in overdoses included antiepileptics, opioids, benzodiazepines, sleep aids, antipsychotics, and bupropion.

Conclusions: This study was limited by its retrospective nature and the fact that drugs implicated in overdose were based on information available in the chart. Formal brain death exams were not done in included patients so we are unable to say if symptoms truly mimicked brain death. Many of the drugs noted to cause illness severe enough to trigger OPO consult have previously been noted to mimic brain death. Other drugs identified in this study that may also cause symptoms similar to brain death are benzodiazepines and antipsychotics.

KEYWORDS Brain death; organ donation; overdose

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54. Case cluster of neurotoxic shellfish poisoning following ingestion of clams collected from the Florida Gulf Coast

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Background: Harmful algal blooms (HAB) are an intermittent ecological hazard caused by the overgrowth of dinoflagellates in response to excessive nutrient water contamination. Commonly called "red tide," *Karenia brevis* produces a heat-stable toxin similar in structure and function to ciguatoxin that bioaccumulates in the flesh of filter feeders such as clams, mussels, and oysters. The mechanism of brevetoxin in humans is mediated by augmented influx through sodium channels in nerve and muscle cells. Symptoms from ingestion primarily involve gastrointestinal distress and neurological abnormalities. Harvesting of contaminated shellfish is unusual due to noxious conditions of the water,