

kinetics in adolescents undergoing rapid skeletal growth are needed to support this conclusion. Osteocalcin concentrations and plotting the growth curve may assist clinicians in determining if pubertal growth is playing a role in increased BLL in adolescents for whom no external source of lead exposure can be found.

### 314. Successful treatment of acute arsenic poisoning with unithiol

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**Objective:** Acute arsenic poisoning is rare, life-threatening and there is not enough clinical experience with appropriate treatment, especially with unithiol (2,3-dimercaptopropane-1-sulphonate, DMPS) [1]. We report a case of acute self-poisoning, which was managed with unithiol without side-effect or late consequences.

**Case report:** A 31-year-old-man ingested 2-3 g arsenic trioxide. Gastric lavage was performed and activated charcoal was administered 1.5 hours later. Within 10 hours post-ingestion he developed vomiting, diarrhoea, dyspnoea, abdominal and chest pain. He was admitted to our hospital 25 hours after ingestion. In the intensive care unit he exhibited hypotension, tachycardia, dehydration, electrolyte and metabolic disturbances, elevated liver function tests, creatine kinase, C-reactive protein and D-dimer. He was treated with supportive care (fluid resuscitation, ulcer prophylaxis and thrombosis prophylaxis, circulation support with norepinephrine, and hepatoprotectants) and chelation therapy with unithiol. His metabolic and electrolyte disturbances improved and his circulation rapidly stabilized. Unithiol was administered intravenously for 5 days (250 mg every 3 hours, then every 4, 6, 12 and 24 hours) then orally 100 mg four times daily for 13 days in our hospital. It was continued in the psychiatric department and at home. Urine arsenic concentration in 24-hour specimens was measured on hospital days 4, 7, and 17 and was 2106 µg/L (10951.2 µg/day), 409 µg/L (1636 µg/day), 29.9 µg/L (125.58 µg/day), respectively. Abdominal ultrasound showed fatty degeneration in the liver and hepatomegaly. Transient elevations in transaminases, gamma glutamyl transferase, and low INR, thrombocytopenia, and hyperglycaemia were detected during his treatment. These symptoms ceased or started to improve in our hospital. He was transferred to the psychiatric department on hospital day 19 with proposal to continue unithiol treatment. His course after discharge was uneventful, and he recovered completely.

**Conclusion:** This was a potentially lethal dose of arsenic with multi-organ complications successfully treated with early decontamination, appropriate supportive care and chelation therapy (unithiol). Unithiol was given parenterally and orally with no side effects, and our patient did not develop any lasting consequences of the ingestion or treatment. Unithiol is a less toxic alternative for chelation than dimercaprol (British Anti-Lewisite, BAL) or penicillamine, and can be used effectively and safely in acute arsenic poisoning.

#### Reference

- [1] Lu PH, Tseng JC, Chen CK, et al. Survival without peripheral neuropathy after massive acute arsenic poisoning: Treated by 2,3-dimercaptopropane-1-sulphonate. *J Clin Pharm Ther.* 2017;42:506–508.

### 315. Non-medical use of prescription GABA analogues (gabapentin and pregabalin) in Europe in the Non-Medical Use of Prescription Drug (NMURx) National Surveys

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**Objective:** Non-medical use (NMU) of prescription GABA analogues in Europe has been reported. We determined the prevalence of prescription GABA analogue NMU and associated demographics in five European countries.

**Methods:** The Survey of Non-Medical Use of Prescription Drugs Program (NMURx) is a series of cross-sectional surveys which collects data from the general population in each participating country about NMU of prescription drugs and demographics. NMU was defined as “using a medication without a doctor’s prescription or for any reason other than what was recommended by their doctor.” Responses France (2Q2017, n=10,012), Germany (4Q2017, n=15,051), Italy (2Q2017, n=10,084), Spain (4Q2017, n=10,062), and the UK (1Q2017, n=10,004) were analyzed. Adult age was defined as ages 15-110 years in Spain,

**Table 1.** NMURx respondents reporting non-medical use of GABA analogues in the past 12 months versus all respondents. Percentage of all responders (95% confidence interval).

	France		Germany		Italy		Spain		UK	
	GABA Analogue NMU	General Population	GABA Analogue NMU	General Population	GABA Analogue NMU	General Population	GABA Analogue NMU	General Population	GABA Analogue NMU	General Population
<b>Male</b>	56.8 (48.19, 65.36)	47.6 (46.59, 48.68)	54.0% (48.13, 59.90)	48.6% (47.79, 49.49)	45.0% (33.54, 56.38)	49.1% (47.89, 50.21)	65.7% (53.60, 77.79)	48.6% (47.47, 49.79)	46.8% (39.82, 53.83)	48.8% (47.61, 49.94)
<b>Lifetime illicit drug use</b>	33.9% (25.71, 42.05)	18.2 (17.39, 18.94)	28.7% (23.42, 34.05)	25.4% (24.70, 26.17)	37.8% (26.47, 49.04)	20.5% (19.64, 21.38)	42.0% (30.86, 53.20)	24.4% (23.45, 25.32)	48.0% (40.95, 54.98)	27.3% (26.22, 28.31)
<b>Previous substance abuse treatment</b>	11.5% (6.04, 16.89)	1.7% (1.46, 1.97)	7.7% (4.56, 10.91)	1.8% (1.59, 2.05)	3.8% (0.00, 8.40)	0.6% (0.47, 0.80)	13.3% (6.45, 20.21)	2.2% (1.92, 2.55%)	19.3% (13.35, 25.21)	1.7% (1.41, 2.02)
<b>DAST-10</b>										
Moderate (3-5)	11.7% (6.19, 17.19)	2.2% (1.86, 2.45)	12.0% (8.08, 15.99)	3.2% (2.86, 3.46)	7.9% (2.50, 13.28)	2.9% (2.51, 3.21)	19.3% (11.11, 27.44)	4.0% (3.58, 4.38)	14.1% (9.62, 18.62)	3.2% (2.72, 3.64)
Substantial (6-8)	8.8% (3.82, 13.87)	0.8% (0.60, 0.94)	3.5% (1.27, 5.77)	0.9% (0.69, 1.01)	1.9% (0.00, 4.13)	0.5% (0.39, 0.68)	6.7% (1.63, 11.70)	1.2% (0.98, 1.42)	11.3% (6.15, 16.46)	1.0% (0.73, 1.23)

16-110 years in the UK, and 18-110 years in France, Germany, and Italy. Responses were collected using non-probability quota sampling and post-stratification population weighting was applied. Rates of NMU and associated demographics were reported as rate of past 90 day NMU per 100,000 adult population with 95% confidence intervals.

**Results:** Prevalence of past 12 month GABA analogue NMU was highest in Germany (1,191.7 per 100,000 population, 95% CI 1,004.3-1,379.1) and the UK (1,067.2, 95% CI 851.3-1,283.2), and lowest in Spain (344.4, 95% CI 204.8-484.0) and Italy (366.2, 95% CI 207.7-524.6). NMU was evenly distributed between genders except in Spain which showed a male predominance (Table 1). Participants reporting NMU of GABA analogues reported higher incidence of lifetime chronic pain, lifetime illicit drug use, and previous substance abuse therapy, and were more likely to have moderate or substantial Drug Abuse Screening Test (DAST)-10 scores than the general population.

**Conclusion:** Respondents to the NMURx Survey in five European countries who reported NMU of GABA analogues were more likely to report chronic pain, use of illicit substances, and history of substance abuse treatment than the general population.

### 316. Clinical outcomes of cardiac glycoside poisoning in Thailand

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**Objective:** To describe clinical characteristics and outcomes of patients with cardiac glycoside poisoning in Thailand including differences of clinical features between pharmaceutical and non-pharmaceutical poisonings.

**Methods:** We performed a retrospective study of patients with cardiac glycoside (including toad as bufotoxin, plants and digoxin) poisoning from Ramathibodi Poison Center Toxic Exposure Surveillance System, during a 5-year period (2012-2016).

**Results:** There were 108 patients included that been exposed to bufotoxin (33.3%), plants (14.8%) and digoxin (51.9%). Plants included *Strophanthus caudatus*, *Adenium obesum*, *Nerium oleander* and yellow oleander (*Cascabela thevetia*). The median age was 43 years (9 days to 95 years). Most were male and presented with gastrointestinal (GI) symptoms. At presentation, 35 patients had bradyarrhythmia (no tachyarrhythmia reported). Twenty-six patients had shock. Patients with digoxin poisoning were older and had more underlying diseases, abnormal serum potassium and bradyarrhythmia at presentation than patients with non-pharmaceutical poisoning. For bufotoxin patients, three developed cardiac arrest (at presentation and in the emergency room [ER]). For patients with plant poisoning, all had GI symptoms and survived, one developed junctional bradycardia. During admission, 17 patients developed bradyarrhythmia and three patients developed tachyarrhythmia. Ventricular tachycardia was detected in three digoxin-poisoned patients. Some had hypokalemia (9.3%) or hyperkalemia (12.3%) at presentation. Serum digoxin concentrations were measured by immunoassay methods in 43 patients with the median concentration of 3.4 ng/mL, and also in four

bufotoxin patients (0.43 to >8 ng/mL). Most patients (75.9%) were admitted to hospital including intensive care. The median hospital stay was 72 hours. The mortality rate was 7.4%. Besides supportive care, some received gastric lavage (25%), activated charcoal (31.5%), endotracheal intubation (10.2%), inotropic drugs (8.3%), transcutaneous cardiac pacing (7.8%) and management of hyperkalemia (17%). Two patients did not develop arrhythmia following intravenous calcium administration for hyperkalemia. Forty-two patients met criteria for treatment with digoxin immune FAB (DigiFab), however only 10 digoxin patients and one bufotoxin patient received DigiFab (1-10 vials), ten of them survived. After we excluded three patients who had cardiac arrest early in the ER, of 28 patients who should have received DigiFab, but were not treated, four of them died, while the others survived. We found that shock, coma and bradyarrhythmia at presentation were statistically significantly different between fatal and survival groups.

**Conclusion:** Cardiac glycoside poisoning caused deaths in Thailand. Clinical features among bufotoxin, plants and digoxin poisonings were not absolutely similar. Of the patients that should have been treated with DigiFab, but did not receive it, most survived with supportive measures.

### 317. Comparison of adverse reactions to a two-bag versus three-bag intravenous acetylcysteine regimen during treatment of paracetamol overdose

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**Objective:** Previous studies have shown that a 2-bag 20-hour intravenous (IV) acetylcysteine regimen reduced the incidence of non-allergic anaphylactic (or "anaphylactoid") reactions compared to the 3-bag 21-hour IV regimen for treatment of paracetamol overdose in smaller cohort studies. We evaluated these reactions from the 2-bag IV acetylcysteine regimen in a larger international collaborative study.

**Methods:** This is an ongoing prospective cohort study of Australian centres using a 2-bag IV acetylcysteine regimen (200 mg/kg over 4 hours, 100 mg/kg over 16 hours) for paracetamol overdose, with data analysed from early 2014 to mid-2018. The comparison group consisted of patients from the Canadian Acetaminophen Overdose Study (CAOS) treated with a 3-bag IV