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Selected Topics: Toxicology

MULTIPLE POISONINGS WITH SODIUM AZIDE AT A LOCAL RESTAURANT

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☐ **Abstract—Background: Sodium azide is a chemical with a mechanism similar to cyanide. There is concern that it could be used as a chemical warfare agent. Objectives: We report a cluster of poisonings that occurred at a public restaurant and the subsequent investigation that identified iced tea contaminated with sodium azide (NaN_3) and hydrazoic acid, as the foodborne vehicle and agents, respectively. Case Report: Five patients became ill within minutes of drinking iced tea at a restaurant. They all presented to the same Emergency Department with similar symptoms, and improved with fluids, antiemetics, and supportive care. A joint investigation by the Dallas County Department of Health and Human Services, the Texas State Health Department, the Dallas County Southwestern Institute of Forensic Sciences, and the medical toxicologists at the University of Texas Southwestern School of Medicine identified iced tea, contaminated with sodium azide (NaN_3) and hydrazoic acid, as the foodborne vehicle and agents, respectively. Conclusion: The recurrence, and seriousness, of these events suggests a need for continued education of emergency providers. Emergency physicians should consider exposures to toxic chemicals in their differential when a cluster of patients presents with similar symptoms over a short period of time.** © 2014 Elsevier Inc.

☐ **Keywords—poisoning; sodium azide; hydrazoic acid; terrorism; metabolic inhibitors**

INTRODUCTION

Sodium azide (NaN_3) is a colorless, odorless, and tasteless, highly water-soluble crystal or powder that forms hydrazoic acid (HN_3) when combined with water (1). It is used as a laboratory preservative and in air bags (2,3). Historically, it was used as an antihypertensive due to its vasodilatory effects (4). Most poisonings from sodium azide (SA) occur during suicide attempts, or are accidental and occur in the laboratory or health care setting, when a vessel containing SA in a clear solution is confused with water and consumed by a victim (4–6).

Similar to cyanide, SA inhibits oxidative phosphorylation (3,4,7). However, it is postulated that the formation of nitric oxide from SA may also be responsible for the vasodilatation and central nervous system toxicity (8,9). Standard treatments for cyanide toxicity, such as sodium thiosulfate and sodium nitrite, do not improve outcomes of patients poisoned by SA (4,10). We report a cluster of poisonings that occurred at a public restaurant, and the subsequent investigation that identified iced tea and SA as the foodborne vehicle and agent, respectively (11).

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CASE REPORT

In April 2010, a city health department was notified of four people who were transferred to the same Emergency Department (ED) over a period of 4 h after developing similar symptoms while drinking iced tea at a local restaurant. The city health department was notified by the hospital and by the city fire and police departments that originally responded to the scene. Symptoms included lightheadedness, nausea, diaphoresis, headache, syncope, a sense of impending doom, and hypotension (Table 1). All of their symptoms developed within minutes of drinking iced tea at the restaurant. All of the patients arrived at the restaurant separately and did not know one another. They arrived at different times over the 4-h period. The times when they arrived at the restaurant and became symptomatic did not overlap with one another. That evening, city officials conducted a site visit at the restaurant, temporarily suspended further sales of the iced tea, and collected samples of iced tea from restaurant tea urns and from 2 of the patients that brought cups of iced tea with them to the ED. The patients brought iced tea with them due to their suspicion that the tea was responsible for their symptoms. They did not bring samples of any other food items with them.

Three of the four patients were examined by the same emergency physician. Due to 2 of the 3 being hypotensive (92/64 and 89/54 mm Hg), he thought that the patients had been poisoned with an antihypertensive agent (Table 1). Laboratory and radiologic diagnostics performed in the ED did not reveal an etiology for their illness; chemistry analysis was normal. ED toxicologic evaluation consisted of urine drug of abuse screens for all patients and a serum ethanol concentration in one patient. The urine drug screens were negative for all patients, and the one serum ethanol concentration ordered was < 1 mg/dL. All received intravenous fluids and hemodynamic monitoring, and were discharged home either that night, or after an overnight admission (Table 1). Upon learning of the cases, the Dallas County Health and Human Services epidemiology and environmental health staff members (DCHHS) obtained and reviewed medical records, interviewed patients and restaurant staff members, and conducted a site visit. Due to a high suspicion for a chemical etiology, DCHHS consulted multiple agencies, including the county crime laboratory (Dallas County Southwestern Institute of Forensic Sciences [SWIFS]), the Food and Drug Administration, the Texas state health department, and local medical toxicologists at the University of Texas Southwestern School of Medicine (UTSW), regarding testing for possible etiologic agents. A comprehensive list of potential agents was developed. Toxicologists at SWIFS assisted in identification of a laboratory capable of conducting the appropriate testing.

A fifth case (Table 1; patient #3) was identified 4 days after the initial health department notification by the Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE). To assess the extent to which others were affected, ESSENCE was searched for patients presenting to any of 18 area EDs with similar symptoms during that time frame. Of 1827 ED visits recorded in ESSENCE during that time, 81 patients presented with chief complaints of altered mental status, dizziness, syncope, tingling, or hypotension. One

Table 1. Case Patients' Demographic, Exposure, and Clinical Outcome Data

	Patient #1	Patient #2	Patient #3	Patient #4	Patient #5
Age, years	46	52	32	50	48
Sex	Male	Female	Male	Female	Female
Food	Bite of a sandwich	Cookie	1 bite of a sandwich and cookie	Cookie	2 bites of a sandwich
Drink (iced tea)*	2 sips	8 ounces	1/4 cup	4 ounces	2 sips
Symptoms					
Headache	Yes	–	Yes	–	–
Syncope	Yes	–	Yes	Yes	Yes
Nausea/vomiting	Yes	Yes	Yes	Yes	Yes
Diaphoresis	Yes	Yes	Yes	Yes	Yes
Chest pain	–	–	Yes	–	–
Dyspnea	Yes	–	–	Yes	Yes
Paresthesias	–	Yes	–	Yes	Yes
Sense of impending doom	Yes	Yes	–	Yes	–
Heart rate (beats/min)†	72	110	62	127	94
Blood pressure (mm Hg)†	92/64	110/68	84/42	89/54	86/54
Treatments	NS	NS, L, O, P	NS, O	NS, O, P	NS, L, O, P
ED Disposition	Discharged	Admitted	Discharged	Admitted	Discharged

NS = normal saline; L = lorazepam; O = ondansetron; P = promethazine; ED = emergency department.
* None of the patients admitted to drinking anything other than iced tea.
† Initial recorded heart rate or blood pressure.