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Susumber berries

Unexpected cause of cholinergic poisoning

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A 65-year-old Jamaican man with no significant medical conditions was brought to the emergency room (ER) after he had suddenly developed abdominal pain, profuse vomiting, and subsequent blurred vision, dysarthria, bilateral hand weakness, and unsteady gait. His initial vital signs and general physical examination were normal. His neurologic examination was significant for widely coarse opsoclonus; severe labial, lingual, and palatal dysarthria; distal weakness of his bilateral wrist extensors (4/5), interossei (4−/5), and opposition (4−/5); dysmetria; presence of Woltman sign, or delayed deep tendon reflexes; and severe gait ataxia. Upon speaking to his wife, who was also in the ER for abdominal pain, we discovered that she too had opsoclonus, dysarthria, bilateral hand weakness, dysmetria, and the presence of Woltman sign, though all to a lesser degree. She revealed that the prior evening, they had eaten an "authentic Jamaican dinner," consisting of codfish, ackee, and frozen, uncooked susumber berries, which she had imported from Jamaica 3 weeks earlier and later frozen. He had consumed more of the susumber berries than she. As he was more severely affected, immediate MRI of the brain to assess for any acute brainstem pathology was performed, but it was normal. After measurement of vital capacities, his being 0.9 L and hers being 1.2 L, both were admitted to the medical intensive care unit for supportive care. The following day, despite being bradycardic to the 40s, her general and neurologic examinations were completely normal. Her husband had minimal L wrist extension weakness (4+/5), with resolution of the other signs and symptoms. Their creatine kinases and transaminases had risen dramatically but responded to aggressive medical management. As they recovered well, an EMG/NCS was not performed. They were discharged home on day 3 of the hospitalization.

DISCUSSION

The susumber berry is a member of the fruit family Solanacea native to Peru, Venezuela, and the Caribbean. It is traditionally used in Jamaican cooking after washing and cooking to a crisp state. The berries are typically picked at various stages of development and once cooked are added to codfish. There are several toxins in this family, including steroid glycoalkaloids (SGA) (α-solanum) and aglycones (solanidine). However, the specific causal toxin is unknown.[1] SGAs are composed of a carbohydrate moiety, typically chacotriose or solatriose, and they are linked to the aglycones. Variations in the cultivar, post-harvest stressors, maturity, and growing conditions can transform normally innocuous berries into toxic substances. The SGA content is commonly increased when the berries are exposed to temperature changes, infection, or injury.[2]

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Few cases of poisoning by susumber berries have been reported, thus the dose response is unknown. In the last 10 years there have been reports of 2 Jamaican families, one in New York City and another in Toronto, who were poisoned by the berries. Affected members had clinical symptoms similar to our patients depending on the amount of berries consumed. Those who consumed minimal amounts of berries had gastrointestinal disturbances, while those with increased consumption had dysarthria, facial droop, dysconjugate gaze, and ataxia. One patient who had consumed more than other members of her family had elevated transaminases and required respiratory support, but was ultimately discharged home after supportive care. Chromatography revealed the presence of 2 toxins, solasonine and solamargine, the latter being lethal. These toxins kill cells by disrupting cell membranes. In all of the cases, the berries were unripe and brought from Jamaica by one of the family members, as in our presentation. Onset of their symptoms, as in our cases, was within several hours after ingestion.[2] Though chromatographic analysis was not performed in our patients, the chronology of symptom onset and resolution appeared consistent with the prior reports.

The SGAs, solasonine and solamargine, are composed of a carbohydrate moiety, solatriose and chacotriose, respectively, and linked to a steroidal aglycone. Solamargine is more lethal and teratogenic. They are synthesized from cholesterol, resulting in resistance to bacteria, fungi, and nematodes. As several different types of SGAs are in the same plant, they act synergistically. They also become heat stable under stress due to the change in their configurations.[2] The toxins in these plants inhibit plasma and erythrocyte acetylcholinesterases. These toxins cause poisoning by 2 means: directly stimulating cholinergic receptors or inhibiting acetylcholinesterase. Clinical symptoms are the result of competing interactions at muscarinic and nicotinic receptors.[3]

Treatment is typically supportive. However, cathartic measures such as charcoal are recommended in cases of severe ingestion.[1] Though rare, poisoning by susumber berries highlights the need for further investigation of food and cultural practices that can give rise to neurologic toxicity.

REFERENCES

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DISCLOSURES

The authors report no disclosures relevant to the manuscript. Go to Neurology.org/cp for full disclosures.