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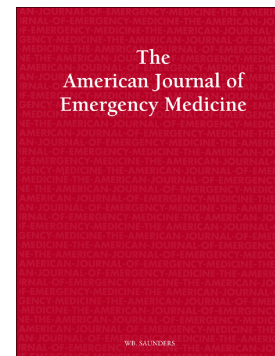
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More than a Drink: A Rare Anaphylactic Reaction to Sparkling Water**Ryan K. Dean DO^a, Rogin Subedi MBBS^a, Peter Christiano^a Anil Ghimire MD^a****^aDepartment of Medicine SUNY Upstate Medical University 750 East Adams Street Syracuse NY 13210**

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Anaphylaxis is a severe, potentially life threatening, type I hypersensitivity reaction which can occur within seconds to minutes after exposure to an allergen. Sulfites have been implicated in causing symptoms ranging from mild wheezing to a potentially life threatening reaction. These reactions have been characterized more often in asthmatics. Here we present an asthmatic patient who had an anaphylactic reaction secondary to exposure to sulfites found in sparkling water.

A 25-year-old female with a past medical history of asthma and anaphylactic reactions to multiple medications, including sulfa antibiotics, presented with a facial rash, generalized pruritus, swelling of the tongue, difficulty swallowing and shortness of breath shortly after drinking sparkling water. She was initially given diphenhydramine, ranitidine and methylprednisolone at an urgent care center and was transferred to the emergency department (ED) for incomplete resolution of her symptoms. She was given epinephrine and intravenous fluids in ED. She was admitted to the ICU and given intravenous methylprednisolone, famotidine, diphenhydramine and albuterol nebulizers with subsequent symptomatic improvement. At one point during hospitalization, she was re-challenged with the same sparkling water, which precipitated an additional anaphylactic reaction. These reactions could not be explained by any new medications. Given her significant allergy history as well as familial allergy history, a C1 esterase inhibitor and complement levels were tested and were ultimately found to be normal.

Sulfiting agents (sulfur dioxide and the sodium and potassium salts of bisulfites, sulfite, and metabisulfites) are widely used, mainly for its inherent cleaning and disinfecting properties. It also has a use as a preservative in food, alcoholic beverages such as beer and wine, and medications. In the food industry, sulfites are used to prevent the growth of bacteria, maintain the color of the food, and allow for a longer shelf life.[1]

Allergies to sulfur are common, but mainly appear when the patient takes certain medications that contain sulfur. However, “sulfa allergies” are a response to sulfonamides, which is a different molecule than the sulfites. While the allergies to sulfa containing drugs are usually easy to diagnose, determining other sensitivities are often not. Patients can develop sensitivities to seemingly anything. This makes it easy to see how it can be challenging to determine the specific culprit for a reaction from the patient. Actually making a diagnosis of sensitivity to a specific entity requires a provocative challenge.[2] Something as small and minor as sulfite can be easily overlooked in the search for the cause of an adverse reaction.

One of the items that contains sulfites is mineral water, also known as sparkling water or seltzer water. These are popular drinks with a wide number of brands and manufacturers. While some brands will declare what the water contains, others will not, which clearly poses a problem for those with allergies or sensitivities to these sulfites. Some mineral waters have reported over 410mg/L of sulfate. While the use of sulfites in food is widely considered a safe practice, issues can arise when people with pre-existing hypersensitivities ingest them.

The mechanism of sulfite intolerance is unknown. It has been postulated that it could be due to partial sulfite-oxidase deficiency and those patients with a sensitivity cannot metabolize an overload of

exogenous sulfite. In fact, it has been shown that cyanocobalamin is able to catalyze the extracellular oxidation of sulfites, thereby preventing their accumulation and subsequent symptoms due to their excess.[3]

Sulfite hypersensitivity is usually, though not exclusively, found in asthmatics. Though there is varying data, it is estimated that 3-10% of all chronic asthmatic adults can display a level of sensitivity to sulfites.[4] The reactions as well as the severity of the reactions caused by sulfite ingestion in someone who is sulfite sensitive can vary from urticaria, dermatitis, flushing, gastrointestinal issues to anaphylaxis. However, the most common reaction seen in asthmatics is bronchoconstriction.[5] Those asthmatics who have a higher degree of airway hyper-reactivity may be at greater risk. This can be seen in adults with severe asthma, where the rates of sulfite sensitivity are as high as 35-65%.[6] Airway smooth muscle cells have been shown to play a role in asthmatic reactions, through their growth and remodeling. Studies have shown that sulfites can lead to structural and functional changes in these airway smooth muscle cells, causing problems for patients with asthma. In addition, bronchospasm may be induced by sulfites by the stimulation of the afferent limb of the cholinergic reflex.[7] Our patient had asthma and presented with an anaphylactic reaction after consuming sparkling water. The certain type of sparkling water consumed was later determined to contain sulfites.

Reports of sulfite intolerance or hypersensitivity have been increasing in frequency. In addition, those patients with asthma may be at a greater risk for developing sulfite related reactions. It is important for clinicians to be aware of these reactions in order to educate patients to avoid such precipitants, including sparkling waters.

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