

Popsicle-induced life-threatening angioedema: case report and literature review

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Abstract

Carmine red is a colorant used widely in the food, cosmetic and pharmaceutical industries, and it has been reported previously as a cause of allergic reaction to sensitive patients ranging from mild skin erythema to angioedema and anaphylaxis. We present a case of a life-threatening allergic reaction to carmine dye present in an ice-popsicle, which was given to a patient in the

hospital setting. The patient developed an acute allergic reaction consisting of angioedema that led to a full cardiorespiratory arrest. Proper labeling of products containing carmine dye are necessary in order to prevent life-threatening or lethal allergic reactions. These products must not be included in the food provided in healthcare institutions.

Key words: Angioedema, carmine, popsicle, red dye, cardiac arrest, allergy.

Carmine (Natural Red #4, E120), is a biogenic extract widely used as a red dye in the food, cosmetics and pharmaceutical industries. It is obtained from dried female *Dactylopius coccus Costa*, a cochineal belonging to the scale insect family. (1-3) Carmine is widely used dye in common household products such as strawberry milk, cocktails, red candies, and as an ice-popsicle colorant. (1-3) Allergic reactions have been associated to this agent. We recently experienced one such case in the in-hospital setting.

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Case Report

A 46-year-old man, with a past medical history of chronic hypertension (Stage II), and food allergy to eggs and fish, was admitted to the surgical floor after he had a laparoscopic Nissen fundoplication. The surgery was uneventful. On the first postoperative night he was started on a clear liquid diet, and he consumed a single red ice-popsicle in his room, after which he complained of shortness of breath and coughing, requiring aggressive suctioning. Approximately one hour later, the patient was found to be restless and in respiratory distress. This was followed by the patient loss of consciousness and development of a full cardiorespiratory arrest. Cardiopulmonary resuscitation (CPR) was performed and several attempts for an emergency endotracheal intubation were unsuccessful, due to severe angioedema and an inability to visualize the airway. Intubation using a Glidescope was also attempted without success. A laryngeal mask airway was placed and return to spontaneous circulation was obtained.

The patient was transferred to the intensive care unit, where the on-call critical care specialist introduced an endotracheal

tube using a fiberoptic bronchoscope and the laryngeal mask airway as a guide. Post CPR, the patient remained comatose and underwent therapeutic hypothermia for 24 hours. After a prolonged and complex hospitalization due to hypoxemic encephalopathy he was weaned off mechanical ventilation. Six months after his original event, the patient still requires full assistance with activities of daily living.

Discussion

The use of carmine red dye became popular since the 1990's due to a resurgence in natural ingredients in the food industries. It is known that both the carmine and cochineal extract contain carminic acid (C₂₂H₂₀O₁₃), a substance that gives properties as coloring agents. (2) From an immunological standpoint, it is believed that this dye promotes an IgE reaction on sensitive patients, presenting a variety of clinical pictures including: occupational asthma, extrinsic allergic alveolitis, cheilitis, food allergy, angioedema and anaphylaxis. (3-5) In order to detect this reaction to the colorant, a series of skin prick tests are performed, grading

the reaction from 0 to 4+, comparing with an histamine control and a non reactive control. To confirm the presence of specific IgE to carmine, a Praunitz-Küstner test can be performed. (2)

Our case is not unique. In 1997, Baldwin and coworkers published a case in which a 27 year-old patient developed an anaphylactic reaction to this food colorant present in an ice-popsicle. (2) Kägi and Wüthrich also described a similar case in which this reaction was due carmine dye present used to manufacture Campari. (4,5) In 2009, Yamakawa and Oosuna reported treating 3 patients with allergic reactions to carmine red. (1)

Conclusions

The use of carmine red dye in products used inside a hospital environment should be avoided. We urge manufacturers of these products to label them properly, as potential allergic reactions can occur after the consumption of these products.

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