

Anaphylaxis to polymyxin B–trimethoprim eye drops



Polymyxin B–trimethoprim eye drops are commonly used to treat bacterial conjunctivitis in the pediatric population. Although allergic reactions to polymyxin, such as contact dermatitis, from topical antimicrobial applications have been reported, to our knowledge no prior literature has documented a case of anaphylaxis after the administration of eye drops that contain polymyxin.^{1–3} In this letter, we describe a case of a systemic anaphylactic response to polymyxin B–trimethoprim eye drops.

A 2-year-old boy presented to the emergency department with severe eye swelling and erythema of the cheeks, which soon progressed to lip swelling and stridor at rest. The symptoms started immediately after the first administration of the second course of polymyxin B–trimethoprim eye drops prescribed to treat bacterial conjunctivitis. Approximately 5 months before this incident, the patient had used polymyxin B–trimethoprim eye drops for the first time to treat a previous episode of bacterial conjunctivitis, which resolved with no sequelae. On presenting to the emergency department with signs of anaphylaxis, he was given 0.15 mg of intramuscular epinephrine, nebulized racemic epinephrine, and 30 mg of methylprednisolone. The patient was admitted to the hospital overnight to monitor for a rebound reaction; however, his symptoms slowly resolved after 24 hours with continued corticosteroid and antihistamine treatment. Before this acute reaction, the patient had no history of allergic reactions or atopic dermatitis.

Three months after his anaphylactic reaction, a skin prick test was performed on the patient at the allergy and immunology clinic. He was tested for sensitization to trimethoprim and polymyxin because the eye drops contained both substances. The skin test result was negative for a reaction to trimethoprim at a concentration of 1/10 as well as when given at full strength (Fig 1). The patient tested negative to polymyxin in a concentration of 1/10, but the results of a full-strength skin test were positive with a wheal and flare size of 5/20 and 5/15, respectively. All tests were run in duplicate, with an unremarkable saline control and a histamine control that measured 5/15. The test was performed again as a control on the physician, who did not have a known allergic response to polymyxin, and it did not result in any skin irritation with the administration of diluted or full-strength polymyxin.

On the basis of these findings, the patient's reaction was consistent with an IgE-mediated hypersensitivity to polymyxin. A literature review revealed few data on testing for systemic reactions to topical antimicrobial treatments and ocular medications. When the patient was administered the drops previously, he was likely sensitized to polymyxin, a multivalent polymer large enough to bind to an IgE antibody. Although we are unaware of other cases of anaphylaxis to polymyxin eye drops in humans, other antibiotics have been found to cause fatal reactions in a study of felines after ocular exposure.⁴ Although the eye is considered an immune privileged site as a result of poorly understood mechanisms that limit immune response within the eye to preserve vision, in this case the eye drops may have caused a systemic reaction by coming into contact with oral and nasal mucosae.^{5–9}

We recommended that the patient avoid polymyxin completely in both topical and other forms, which includes many over-the-counter antibacterial ointments, such as neomycin, polymyxin, and bacitracin zinc ophthalmic ointment, and certain vaccines, including the inactivated polio vaccine and certain types of the influenza vaccine. If the patient requires trimethoprim-containing components in the future, we recommended caution and a preliminary challenge in a small dose because a negative skin prick test result to the drug does not completely exclude a potentially severe reaction. Although a systemic allergic reaction to eye drops is expected to be rare, physicians should be aware of the potential for anaphylaxis after ocular administration of antibiotic eye drops, especially considering their use as a first-line treatment for the common pediatric condition of bacterial conjunctivitis.

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Figure 1. Skin prick testing to polymyxin (left side) and trimethoprim (right side) in duplicate, with a histamine control (+) and saline (–) in the center. The inner columns are in a 1/10 concentration, and the outer columns are full strength.