Anaphylaxis after First Exposure to Ophthalmic Cyclopentolate 1%

Alexandra Langlois* and Moshe Ben Shoshan
Division of Pediatric Allergy and Immunology, Department of Pediatrics, Montreal Children’s Hospital, McGill University Health Center, Canada

*Corresponding author: Alexandra Langlois. Email: alexandra.langlois@mail.mcgill.ca

Received: 23 December 2016; Accepted: 03 February 2017; Published: 15 February 2017

Abstract

Rationale: Cyclopentolate is a synthetic antimuscarinic drug that has been used commonly since 1950 as a mydriatic topical agent in ophthalmologic procedures. The most commonly used 1% solution induces very few side effects with the exception of symptoms related to its pharmacologic properties. We report a case of infant presenting with anaphylaxis shortly after topical administration of cyclopentolate 1% for cycloplegic refraction and dilated fundus exam.

Methods: Skin prick tests were performed with 1% cyclopentolate hydrochloride at a dilution of 1/10 in normal saline, negative control (saline) and positive control (histamine).

Results: This patient presented to emergency department with anaphylaxis shortly after topical administration of cyclopentolate 1% for cycloplegic refraction and dilated fundus exam in Ophthalmology clinic. She presented conjunctival erythema, facial flushing and angioedema. This was followed with respiratory distress and wheezing. Both eyes were flushed with saline and she received a standard anaphylaxis treatment including epinephrine. Skin prick test with a 1% cyclopentolate hydrochloride at a dilution of 1/10 was positive with wheal and erythema size: 4 mm and 10 mm respectively. Wheal and erythema size for negative control and positive control were 0/0 and 5/10 respectively.

Conclusions: This is one of the rare case reports of cyclopentolate anaphylaxis. Although it is commonly used in clinical practice, there is not much awareness of the allergic potential of this agent. Clinicians and in particular ophthalmologists should be aware of the risk of IgE-mediated reactions associated with the use of topical cyclopentolate.

Keywords: Cyclopentolate hydrochloride; Antimuscarinic drug; Anaphylaxis; Type 1 hypersensitivity; IgE-mediated allergy; Adverse drug reaction

Background

Cyclopentolate is a synthetic antimuscarinic drug that has been used commonly since 1950 as a mydriatic topical agent in diagnostic procedures [1,2]. During this time very few side-effects have been reported with the most commonly used 1% solution [2]. However, more recently a few case reports suggest that IgE-mediated reactions to topical 1% solution of cyclopentolate may occur [1,2]. We report a case of infant presenting with anaphylaxis shortly after topical administration of cyclopentolate 1% for cycloplegic refraction and dilated fundus exam.

Case Presentation

An 11-month-old girl was assessed due to suspected strabismus in the Ophthalmology clinic in our hospital. There was no past history of atopy and this was her very first exposition to cycloplegic medication. She was administered cyclopentolate hydrochloride 1% ocular drops in both eyes.

Twenty minutes after administration of the ocular drops, the patient developed conjunctival erythema and facial flushing as well as angioedema (Figure 1). It was followed with respiratory distress and wheezing. The patient was transferred to the adjacent emergency room. She had a heart rate of 185 beats per minute, respiratory rate of 30 per minute, blood pressure of 121/66 mmHg and saturation of 100%. She was treated with intramuscular epinephrine 0.01 mg/kg, diphenhydramine 1mg/kg and prednisolone 1mg/kg. Both eyes were flushed with normal saline. Following treatment there was rapid resolution of symptoms. She was monitored in the Emergency Department for four hours and was discharged home. Tryptase levels drawn after arrival to the emergency department were within the normal limits (5.3mcg/L normal range: 0.0-13.5 mcg/L). A month later she was assessed in the Allergy clinic. The tryptase was repeated and was 4.8 mcg/L (normal range: 0.0-13.5 mcg/L). This does not represent a significant variation. Skin prick test with a 1% cyclopentolate hydrochloride at a dilution of 1/10 in normal saline was positive (wheal and erythema size: 4 mm and 10 mm respectively. Wheal and erythema size for negative control (saline) and positive control (histamine) were 0/0 and 5/10 respectively.

The parents were advised to avoid cyclopentolate and have a bracelet indicating her hypersensitivity.

Discussion

Toxic effects related to pharmacologic properties of antimuscarinic topical agents are well described in the literature and include tachycardia, hypertension, flushing and potentially effects on the central nervous system such as hallucinations, ataxia, dysarthria and confusion. However, IgE-mediated reactions to cyclopentolate have been described so far in only 2 papers [1,2]. Given the frequent use of this topical agent it is crucial to be aware of the diagnosis and management of IgE-mediated reactions to cyclopentolate.

The reaction presented by our patient fulfills the consensus definition of anaphylaxis [3-5]. The positive skin test conducted according to a previously validated protocol [1] provides a safe and reliable confirmatory test for the diagnosis of cyclopentolate allergy. Topical cyclopentolate drops gain entrance to the systemic circulation within minutes of application by absorption through the cornea, conjunctiva, nasolacrimal mucosa and gastrointestinal tract [6]. Our patient reacted on first exposure to cyclopentolate and had never been in contact with other antimuscarinic agents. However, lack of prior known exposure does not rule out the possibility of an IgE-mediated reaction. It is not clear what is the underlying mechanism for reactions occurring after first exposure but the clinical presentation and the improvement with prompt epinephrine treatment as well as subsequent positive confirmatory skin test are sufficient to define this reaction as cyclopentolate induced
anaphylaxis [7-9]. Similar to other cases of anaphylaxis, the main treatment is prompt administration of intramuscular epinephrine.

In conclusion, the case described exemplifies challenges related to diagnosis and management of cyclopentolate induced allergic reactions. Although it is commonly used in clinical practice, there is not much awareness of the allergic potential of this agent. Clinicians and in particular ophthalmologists should be aware of the risk of IgE-mediated reactions associated with the use of topical cyclopentolate.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying image. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Conflict of Interests

The authors declare that they have no competing interests.

References


