

Immediate allergic reaction to atropine in ophthalmic solution confirmed by basophil activation test

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We present the case of a 9-year-old girl, remitted to our department by the department of General Surgery after being diagnosed of incarcerated umbilical hernia that required surgery treatment.

The patient relates background of corneal opacity with sight loss of the right eye under periodic ophthalmic examination. This is the reason why, at the age of

Atropine used as a mydriatic drug can induce type I hypersensitivity reactions. The basophil activation test is a useful tool to confirm these cases.

7 months, she underwent pupil dilation with atropine; immediately after administration of a unique drop, she presented erythema and generalised oedema. She had undergone previous ophthalmic examinations, but the parents did not remember whether pupil dilation with atropine had been performed. No other known background of allergic processes.

After that incident, atropine was not used in other pupil dilations and the patient did not present any similar reaction.

Skin test with inhalant allergens and specific IgE determination to latex (0.01 kU/l) were negative. Skin tests with atropine, prick (1 mg/ml) was negative and intradermal test was

positive with atropine 0.1 mg/ml (papule of 10 × 8 mm; histamine 11 mm × 8 mm). Ten controls were performed with atropine, all of them with negative result. The basophil activation test (BAT) was positive with atropine [basal activation: 0.60%; anti IgE: 4.50%; atropine 1.25 µg/ml (first dilution): 1.10%, and atropine 0.3 µg/ml (second dilution): 10.70%]. Three controls were performed with negative results.

The patient was diagnosed of allergy to atropine and was advised to avoid the administration of belladonna alkaloids (atropine, butylscopolamine, etc.). Subsequently, she underwent without problems surgery of umbilical hernia under general anaesthesia where neither atropine nor any other anticholinergic drug was used.

Atropine has been described to produce allergic and non-allergic reactions. Among the allergic ones anaphylactic reactions have been described (1). Allergic reactions to mydriatic eye drops are rare, with a prevalence of 6% and can be induced by the active pharmacological agent, by the preservatives or by other additives. The most frequently involved mydriatic is the phenylephrine (50–90% of the cases). In most cases they are induced by a type IV hypersensitivity being the type I mechanism rare, like in our case. We did not find in the literature any cases of immediate allergy to atropine after its administration in drops as a mydriatic although some cases of intraoperative anaphylaxis after intravenous administration of atropine have been described (2, 3).

Allergy to atropine means a difficulty for future anaesthesia procedures, because of its use in the premedication to avoid vagal reflex during surgery, and to help eliminating the airways secretions. The alternative to atropine would be the glycopyrrolate,

not commercialised in some countries; otherwise an alpha-beta blocker could be used, such as Ephedrine, in case of vagal complications during the intervention. The alternative mydriatic drugs to atropine would be the phenylephrine and the adrenaline.

This case highlights once again the reliability of BAT in the diagnosis of drug allergy (4, 5).

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References

- Robenshtok E, Luria S, Tashma Z, Hourvitz A. Adverse reaction to atropine and the treatment of organophosphate intoxication. *Isr Med Assoc J* 2002;4: 535–539.
- Coelho D, Fernandes T, Branga P, Malheiro D, Rodrigues J. Intraoperative anaphylaxis after intravenous atropine. *Eur J Anaesthesiol* 2007;24: 289–297.
- Aguilera L, Martinez-Bourio R, Cid C, Arino JJ, Saez de Eguilaz JL, Arizaga A. Anaphylactic reaction after atropine. *Anaesthesia* 1988;43:955–957.

4. De Weck AL, Sanz ML, Gamboa PM, Aberer W, Bienvenu J, Blanca M et al. Sainte-Laudy Diagnostic tests based on human basophils: more potentials and perspectives than pitfalls. *J Int Arch Allergy Immunol* 2008;**146**:177–189 [Epub 2008 Feb 11, Review].
5. De Week AL, Sanz ML, Gamboa PM, Aberer W, Bienvenu J, Blanca M et al. Diagnostic tests based on human basophils: more potentials and perspectives than pitfalls. II. Technical issues. *J Invest Allergol Clin Immunol* 2008;**18**:143–155 [Review].