Anisocoria in a Patient with Acute Bronchiolitis
Akut Bronşiyolitli Bir Hastada Anizokori

Neslihan Kara1, Seda Çelik1, Gözde Gürpınar1, Nazan Dalgıç2, Ihsan Kafadar3

1 Department of Pediatrics, Sisli Hamidiye Etfal Training and Research Hospital, Istanbul, Turkey
2 Department of Pediatric Infectious Diseases, Sisli Etfal Hamidiye Training and Research Hospital, Istanbul, Turkey
3 Department of Pediatric Neurology, Sisli Hamidiye Etfal Training and Research Hospital, Istanbul, Turkey

Abstract
The term anisocoria refers to pupils that are of different sizes. The causes of anisocoria include physiological anisocoria, pharmacological anisocoria, cerebral neoplasms, and space occupying lesions such as aneurysms, and intracranial hemorrhage. The aim of the current manuscript is to present a 7-month old male case of sudden onset anisocoria who was on follow-up due to acute bronchiolitis and was receiving therapy with salbutamol and ipratropium bromide.

Keywords: Anisocoria, acute bronchiolitis, ipratropium bromide, salbutamol

Introduction
Anisocoria can be the result of physiological factors but may also occur in life-threatening conditions. Anisocoria requires immediate diagnosis and treatment, as it may be a sign of uncal herniation (1).

Anisocoria occurs as a result of dilation or constriction of a single pupil.

As the pupil dilates in dim light, anisocoria that becomes more prominent in the dark indicates that the small pupil is abnormal and points to a problem in the sympathetic pathways. As the pupils constrict in the light, anisocoria that becomes more prominent in the light indicates that the large pupil is abnormal and points to a problem in the parasympathetic pathway (2).

The causes of an abnormally small pupil include iridocyclitis, previous eye surgery, pseudoexfoliation syndrome or pharmacological constriction caused by topical agents such as pilocarpine, and Horner syndrome in which ipsilateral sympathetic pathway is not functional (2). An abnormally large pupil is caused by posterior synechia, previous eye surgery, ocular trauma, pseudoexfoliation syndrome, and ipsilateral third cranial nerve palsy. An abnormally large pupil may also be observed in patients with migraine due to episodic unilateral mydriasis (3). Furthermore, the topical application of agents such as atropine, tropicamide, and cyclopentolate causes pupil dilation.

During treatment of obstructive airway diseases, nebulized ipratropium bromide may cause mydriasis through local parasympatholytic effect by blocking muscarinic acetylcholine receptors (4).
The current report presents a case 7-month-old male case of isolated unilateral mydriasis that developed during therapy with ipratropium bromide in the absence of neurological findings.

Case Report

A 7-month-old male patient was admitted to the pediatric emergency outpatient clinics with the complaint of coughing. Physical examination showed prolonged expiration and rhonchi. Chest X-Ray showed bilateral aeration. There were no pathological laboratory findings other than CRP value being 94 mg/dL. The patient was admitted to the service with the diagnosis of acute bronchiolitis. A therapy with salbutamol aerosol 0.2 mg/kg/dose six times daily was initiated. A consultation with the division of pediatric allergy was performed when it was realized in the second day of the treatment that the patient had recurrent episodes of bronchiolitis. Salbutamol therapy was ceased and switched to Combivent® nebulas that contain a combination of salbutamol and ipratropium bromide, and methyl prednisolone 2 mg/kg/day. The patient developed anisocoria at the fourth day of the therapy (Figure 1). The right eye was mydriatic when compared with the left eye, and light reflex could not be obtained. Eye movements were normal. The patient’s neurological examination was normal. There were no eye problems, previous eye surgery or congenital disease in the past medical history that would explain anisocoria. There was also no recent history of topical application of any agent to the eyes. The family history was not remarkable and ophthalmologic pathologies were ruled out. A consultation with a pediatric neurologist was performed and the patient was administered mannitol 0.5 mg/kg as IV infusion and methyl prednisolone 2 mg/kg for a possible increase in the intracranial pressure. Cranial computed tomography (CT) scans obtained thereafter showed no space occupying lesion or hemorrhage that may cause anisocoria. There was no history of topical application of cycloplegic drugs. There was no other eye pathology or previous history of eye surgery.

It is typical of these cases that the findings disappear upon cessation of aerosol therapy (6). In this patient, mydriasis recovered 24 hours after cessation of nebulas treatment.

In conclusion, anisocoria is a pathology that requires immediate diagnosis and treatment. If anisocoria develops in patients receiving ipratropium bromide nebulas treatment in the absence of neurological findings, other causes must be ruled out as the first step and then it should be considered that ipratropium bromide may cause anisocoria.

Anisocoria caused by ipratropium bromide is a rare and preventable condition. It is therefore very important to instruct the parents of pediatric patients about the proper use of face masks.

Discussion

Salbutamol and ipratropium bromide are agents that cause bronchial dilation when used as an aerosol in the treatment of obstructive or reactive airway diseases such as asthma and bronchiolitis. When used as an aerosol, both salbutamol and ipratropium bromide may cause mydriasis through parasympatholytic effect by blocking the muscarinic acetylcholine receptors; however, this effect is more common with ipratropium bromide. This often occurs in children when the face mask is loosely worn during aerosol therapy (5).

These patients do not have any neurological symptom other than unilateral mydriasis unresponsive to light. Free-viewing eye movements are normal. Cranial imaging studies show no space occupying lesion or hemorrhage that may cause anisocoria. There exists no history of topical application of eye drugs. There is also no history of previous eye surgery, ocular trauma, pseudoxefoliation syndrome or posterior synechia.

The present case also showed no pathological finding other than the absence of light reflex and mydriasis in the right eye. Free-viewing eye movements of the patient were normal. Cranial CT scans showed no space occupying lesion or acute hemorrhage. There was no history of topical application of cycloplegic drugs. There was no other eye pathology or previous history of eye surgery.

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Figure 1. Unilateral mydriasis and absence of light reflex following ipratropium bromide nebulas treatment.

Figure 2. Recovery of mydriasis in the right eye 24 hours after cessation of ipratropium bromide therapy and equal sizes of both pupils.
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Informed Consent: Could not be obtained because the patient could not be follow-up.

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References


