



Anisocoria in a Patient with Acute Bronchiolitis

Akut Bronşiyolitli Bir Hastada Anizokori

Neslihan Kara¹, Seda Çelik¹, Gözde Gürpınar¹, Nazan Dalgıç², İhsan 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

Özet

Anizokori, her iki pupillanın birbirinden farklı büyüklüklerde olması demektir. Anizokori nedenleri arasında fizyolojik anizokori, farmakolojik anizokori, serebral neoplazi ve anevrizma gibi yer kaplayan oluşumlar ve intrakranial kanamalar bulunmaktadır. Burada akut bronşiyolit nedeniyle takip ettiğimiz, salbutamol ve ipratropium bromür tedavisi alan 7 aylık erkek hastada ani gelişen anizokoriyi sunmayı amaçladık.

Anahtar Kelimeler: Anizokori, akut bronşiyolit, ipratropium bromür, 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 constricts 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).

Correspondence Address / Yazışma Adresi

Neslihan Kara

Şişli Hamidiye Etfal Eğitim ve Araştırma Hastanesi,
Çocuk Sağlığı ve Hastalıkları Kliniği, İstanbul-Türkiye

E-mail: neslihan.kara@sislietfal.gov.tr

©Copyright 2018 by Pediatric
Infectious Diseases Society -Available online at
www.cocukenfeksiyon.org

©Telif Hakkı 2018
Çocuk Enfeksiyon Hastalıkları Derneği -Makale metnine
www.cocukenfeksiyon.org web sayfasından ulaşılabilir

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 mass lesion or any neurologic pathology that could cause anisocoria. As the patient had no neurological pathology or eye pathology explaining the existing findings, it was considered that the patient might have developed anisocoria associated with ipratropium bromide, which is rarely observed; thus, ipratropium bromide and salbutamol combination was

stopped. Anisocoria recovered 24 hours after cessation of this therapy (Figure 2).

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 movement 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, pseudoexfoliation 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. Crania 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.

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.



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.

Informed Consent: Could not be obtained because the patient could not be follow-up.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - NK, ND; Design - NK, SÇ; Supervision - ND, GŞ; Collection and/or Processing - NK, SÇ; Analyse - NK, İK, ND; Literature Review - NK, GŞ; Writing - NK; Critical Review - ND, GŞ; all authors contributed to patient follow-up.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

References

1. Chaudhry P, Friedman DI, Yu W. Unilateral pupillary mydriasis from nebulized ipratropium bromide: A false sign of brain herniation in the intensive care unit. *Indian J Crit Care Med* 2014;18:176-7.
2. Kedar S, Biousse V, Newman NJ. Approach to the patient with anisocoria. In: Brazis PW, Wilterdink JL (eds.) *Up to date* (2017). Available from: <https://www.uptodate.com/contents/approach-to-the-patient-with-anisocoria>
3. Skeik N, Jabr FI. Migraine with benign episodic unilateral mydriasis. *Int J Gen Med* 2011;4:501-3.
4. Penington KM, St. Louis EK. "Don't believe your eyes" ipratropium induced mydriasis: a case report and review of the literature. *Gen Med (Los Angeles)* 2016;4:255.
5. Sangwan S, Gurses BK, Smaldone GC. Facemasks and facial deposition of aerosols. *Pediatr Pulmonol* 2004;37:447-52.
6. Açıkgöz A, Açıkgöz ÖU, Açıkgöz A, Aykaç B, Karaoğlu K. Yoğun bakımda takip edilen hastada ani gelişen anizokori. *GKDA Dergisi* 2014;20:63-