Case report

Transient anisocoria in a patient treated with nebulized ipratropium bromide

Renato Pejic, a, * Branka Klaric b

a Department of Ophthalmology, University Clinical Hospital Mostar, Mostar, Bosnia and Herzegovina
b Department of Pulmonology, University Clinical Hospital Mostar, Mostar, Bosnia and Herzegovina

Article info

Article history:
Received 4 November 2016
Accepted 10 April 2017
Available online 12 April 2017

Keywords:
Anisocoria
Ipratropium bromide
Mydriasis
Intracranial hypertension

Abstract

Purpose: We present a case report of a 44-year old female patient with complicated pneumonia who developed anisocoria after treatment with inhaled ipratropium bromide. Discontinuation of ipratropium bromide treatment led to complete resolution of anisocoria.

Observation: A 44-year old female patient was admitted to the Department of Pulmonology due to high body temperature (40.0 °C), coughing and general weakness. After a general examination and tests the patient was diagnosed with right-sided pneumonia. Since spirometry test showed signs of bronchial obstruction, pulmonologist indicated inhalation therapy with ipratropium bromide. Soon after ipratropium bromide therapy was initiated, the patient noticed enlarged left pupil and stated that some aerosol reached her left eye during the inhalation therapy. After consulting neurology and monitoring neurological signs, ipratropium bromide treatment was discontinued. Twenty-four hours after discontinuing the ipratropium bromide treatment anisocoria was completely resolved.

Conclusions and importance: Presence of anisocoria may be a concerning neurological sign. If there are no other neurological or ophthalmological signs and symptoms and a recent ipratropium bromide inhalation treatment exists in the patient’s history, we should consider iatrogenic side-effect of drugs as a possible reason of anisocoria and possibly spare the patient extensive and invasive diagnostic procedures that can also raise costs of treatment significantly. Observing neurological status and testing with 1% pilocarpine solution may be necessary to determine the etiology of this condition.

© 2017 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

1. Introduction

Anisocoria may be a sign of uncal herniation due to acute intracranial hypertension or another intracranial process, such as tumor or hemorrhage. New onset of anisocoria may lead to a specialty consultation as well as neuroimaging, which can raise costs of treatment significantly and expose a patient to additional stress and risk (radiation, allergic reactions etc.). When a diagnosis of increased intracranial pressure is confirmed, these potentially expensive tests are appropriate. However, sometimes it is wise to consider other possible reasons of unilateral dilated pupil, and possibly spare the patient unnecessary expense. Here we present a case report of a 44-year old female patient with complicated pneumonia who developed anisocoria after inhaled ipratropium bromide treatment.

2. Case report

A 44-year old female patient was admitted to the Department of Pulmonology due to high body temperature (40.0 °C), coughing and general weakness. After a general examination and tests (X-ray of thorax, laboratory tests, spirometry) the patient was diagnosed with right-sided pneumonia. The patient was administered appropriate antibiotics. Since spirometry test showed signs of bronchial obstruction, pulmonologist indicated inhalation therapy with ipratropium bromide (1 ml of 0.025 mg/ml ipratropium bromide solution diluted in 2 ml of normal saline solution, inhaled during 15 min.). Soon after ipratropium bromide solution inhalation started, the patient noticed blurry vision in her left eye and noticed in the mirror that her left pupil was larger. She also emphasized that she had problems with the fit of the inhalation mask, and that there was some aerosol reaching her left eye occasionally during the inhalation.

An ophthalmological examination showed that best corrected visual acuity was 20/20 in both eyes, and intraocular pressure was...
within the normal range (13 mmHg). There was no conjunctival reaction in either eye, and optical media was transparent. The left pupil was larger than the pupil in the other eye and reaction to light exposition was slower and incomplete. Pupillary reactions in the right eye were normal. A fundus examination showed normal posterior segment bilaterally. Since the patient reported a poorly fitting of inhalation mask and did not show any other sign of neurological disorder, it was advised to monitor her neurological status and consult the neurologist for need of further test, such as neuroimaging.

As the patient also developed sinus tachycardia after ipratropium bromide inhalation, treatment was held.

Approximately six hours after discontinuing the ipratropium bromide treatment, the anisocoria was almost completely resolved, and after twenty-four hours there was no sign of anisocoria.

3. Discussion

Patients with bronchial obstruction are often treated with nebulized ipratropium bromide, which is inhaled through a face mask. Ipratropium bromide is a derivative of atropine that antagonizes acetylcholine at muscarinic cholinergic receptors.1 Aerosol inhalation of ipratropium bromide has maximum effect 30–60 minutes after administering and duration of action is 3–6 hours.6 It has rare side-effects, such as nausea, constipation and headache induced mydriasis,6 when 1% pilocarpine is administered topically to cause miosis in patients with dilated pupil due to third nerve compression such as in uncal herniation. But when acetylcholine antagonist, such as ipratropium bromide, is administered to the eye prior to pilocarpine, it will block muscarinic receptors and prevent miosis in these patients, which can be seen of iatrogenic anisocoria.7,9

4. Conclusions

Presence of anisocoria may be a worrisome neurological sign. If there are no other neurological or ophthalmological signs or symptoms and there is history of recent ipratropium bromide treatment, we should consider iatrogenic side-effect of drug as a possible reason of anisocoria and possibly spare the patient extensive and invasive diagnostic procedures that can also raise costs of treatment significantly. Observing neurological status and consideration of testing with 1% pilocarpine solution can be helpful in determining the etiology of this condition.

Patient consent

Patient consented orally to publication of the case.

Funding

No funding or grant support.

Authorship

All authors attest that they meet the current ICMJE criteria for authorship.

Conflict of interests

The authors have no financial disclosures.

Acknowledgments

1. Irena Sesar, MD, PhD, Head of Department of Ophthalmology of University Clinical Hospital Mostar.; Dr. Sesar provided the authors with an insight in the necessary documentation and literature.
2. Renata Jurina, MD, neurologist; Dr. Jurina is the neurologist who performed neurological examination and observation in the described case report.
3. Ivana Bevanda-Lesko; Prof. Bevanda-Lesko has edited the text in order to be in compliance with American English.

References

1. Chaundry P, Friedman DI, Yu W. Unilateral pupillary midriasis from nebulized ipratropium bromide: a false sign of brain herniation in the intensive care unit. Indian J Crit Care Med. 2014;18:176–177.
2. Montuschi P. Pharmacological treatment of chronic obstructive pulmonary disease. Int J Chron Obstruct Pulmon Dis. 2006;1:409–423.
3. De Saint Jean M, Bourcier T, Bordierie V, Moldovan M, Touzeau O, Laroche L. Acute angle-closure glaucoma after treatment with ipratropium-bromide and salbutamol aerosols. J Fr Ophthalmol. 2000;23:603–605.
4. Ortiz Rambla J, Hidalgo Morca JJ, Gascon Ramon G, Navarro Arambudo B. Acute angle-closure glaucoma and ipatropium bromide. Med Clin (Barc). 2005;124: 795.
5. Fernandez-Barrientos Y, Jimenez-Santos M, Martinez-De-La-Casa JM, Mendez-Hernandez C, Garcia-Feijoo J. Acute angle-closure glaucoma resulting from treatment with nebulised bronchodilators. Arch SocEspOftalmol. 2006;81: 657–660.
6. Helprin GA, Clarke GM. Unilateral fixed dilated pupil ssociated with nebulised ipratropium bromide. Lancet. 1980;2:1469.
7. Bisquerra RA, BotzGH, Nates JL. Ipatropium-bromide-induced acute anisocoria in the intensive care setting due to ill-fitting face masks. Respir Care. 2005;50:1662–1664.

8. Camkurt MA, Ay D, Akkucuk H, Ozcan H, Kunt MM. Pharmacologic unilateral mydriasis due to nebulized ipratropium bromide. Am J Emerg Med. 2011;29:576.

9. Brody T, Adalat S. Unilateral fixed dilated pupil in a well child. Arch Dis Child. 2006;91:961.

10. Quinonet ZA, Ravula NR. Anisocoria in a 10-month old girl in the immediate preoperative setting: can you proceed with surgery? J Biomed Res. 2011;25:224–226.