AUCTORES
Globalize your Research

Journal of Brain and Neurological Disorders
PD Gupta *

Open Access

Review Article

Two Different Side Effects of Cyclopentolate Eye Drop in Children

Faruk İncecik [1]*, Kemal Yar [2]

[1] Division of Pediatric Neurology, Department of Pediatrics, Adana, Turkey

[2] Department of Ophthalmology, Cukurova University Faculty of Medicine, Adana,

***Corresponding Author:** Faruk İncecik, 1Division of Pediatric Neurology, Department of Pediatrics, Adana, Turkey.

Received Date: 22 December 2023 | **Accepted Date:** 26 December 2023 | **Published Date:** 04 January 2024

Citation: Faruk İncecik, (2024)., Two Different Side Effects of Cyclopentolate Eye Drop in Children, J; Brain and Neurological Disorders; 7(1): **DOI:** 10.31579/2642-973X/093

Abstract

Cyclopentolate is one of the most frequently used cycloplegic agents in children due to its low incidence of systemic reactions and rapid onset of cycloplegia. Systemic side effects have been described in children include flushing, tachycardia, feeding intolerance, seizures, drowsiness, behavioural changes and transient psychotic reactions. In this report, we present the two different side effects of cyclopentolate eye drop in children. One of these side effects was central facial palsy and the other was systemic side effect.

Keywords: Cyclopentolate; Side effect; Children

Introduction

Patients undergoing ophthalmoscopy in hospital for various reasons are given eye drops often for cycloplegia and mydriasis to facilitate examination of the retina. Cyclopentolate is widely used for its intense mydriatic and cycloplegic activity in ophthalmology. It is an anticholinergic, antimuscarinic tertiary amine with atropine-like actions [1].

In literature, there have been reported systemic side effects, especially in the central nervous system (CNS) in both adults and children. CNS side effects include urticarial rash, headache, nausea, flushing, tachycardia, seizures, and drowsiness. Also, behavioural changes and transient psychotic reactions may occur [1-3].

Herein, we present two different side effects associated with cyclopentolate eye drop that one of these side effects was facial palsy and the other was systemic side effects include behavioral changes, visual hallucinations, and gait ataxia in children. To our knowledge, central facial palsy is the first report in children in the Turkey.

Case Reports

Case 1: A previously healthy 15-year-old girl presented with headache and fever to our hospital. The parents were no consanguineous, and there was no family history of neurologic disease.

On her examination, the vital signs, including the blood pressure were normal. Her height and weight were normal for her age. She had a normal physical examination and neurologic examination. She was evaluated for funduscopic examination in the department of ophthalmology. One drop of 1% cyclopentolate hydrochloride was instilled into each eye on three occasions with a 10-minute interval, and ophthalmological examination was performed one hour later resulting normal. Her funduscopic examination was normal.

One hour after the funduscopic examination, she developed acute left-sided facial weakness. Her face became distorted and lateralized to the right when she was asked to smile. The patient had no other neurological and systemic findings other than facial paralysis. Cranial nerve examination showed left central facial palsy. Pupils were widely dilated and fixed (effect of cyclopentolate). She had no tachycardia and facial flushing. The patient's systemic and neurological examination was completely normal except for left facial paralysis. Her cerebral magnetic resonance imaging were unremarkable. Based on these findings, we thought cyclopentolate hydrochloride may be the cause of her complaints. Her symptoms gradually resolved over the next 6-8 h spontaneously. Written informed consent was obtained from patients' parents who participated in this case.

Case 2: A previously healthy 6-year-old girl admitted to our hospital with complaint of behavioral changes, visual hallucinations, and difficulty in walking for two hours. She was examined at another hospital due to lack of vision in the department of ophthalmology. For fundus examination, she was advised to in still cyclopentolate eye drop. After one hour, she developed altered behaviour, visual hallucinations, and gait difficulties.

On her examination, she was disoriented, with ataxic gait and slurred speech. She had no tachycardia and facial flushing. Pupils were fixed and dilated (effect of cyclopentolate). Rest of the examination was normal. By these findings, we thought side effect of cyclopentolate. Her symptoms gradually resolved over the next 6-8 h. Written informed consent was obtained from patients' parents who participated in this case.

Discussion

Cyclopentolate is a cycloplegic agent used commonly in pediatric neurology practice. It is a synthetic anti-cholinergic agent that produces mydriasis, cycloplegia and is well absorbed, both into the eye and systemically. It is a muscarinic receptor antagonist similar to atropine [1]. The time of maximum cycloplegia has been found to vary from 10 to 60 minutes after instillation of cyclopentolate. Cyclopentolate eye drops pass readily through nasolacrimal duct and are well absorbed locally as well as systemically through conjunctiva and nasal mucosa. Systemic absorption also occurs through oropharynx, digestive system, and skin [2,3].

There have been various reports of side effects following application of cyclopentolate eye drop in the literature.1-4 Side effects are such as flushing, tachycardia, feeding intolerance, drowsiness, seizures, behavioural changes, and transient psychotic reactions [1-3.] The systemic side effects are due to anticholinergic action causing stimulation of the medulla and cerebral structures. In view of the smaller body mass in children, the risk of side effects is higher [1].

Büyükcam et al. reported a case of a 3 month-old girl who experienced a myoclonic seizure lasting over one hour after application of cyclopentolate hydrochloride and phenylephrine hydrochloride [4]. In another case, Fitzgerald et al. described a 4.5 year old boy with cerebral palsy presented with seizures associated with cyclopentolate hydrochloride [5]. Pooniya et al. reported systemic toxicity of cyclopentolate eye drop in a child [2]. The patient had altered behaviour, visual hallucinations, and difficulty in walking due to cyclopentolate hydrochloride. We present two different side effects associated with cyclopentolate eye drop that one of these side effects was facial palsy and the other was systemic side effects include behavioral changes, visual hallucinations, and gait ataxia in children. We thought that the CNS toxicity is due to anticholinergic action causing stimulation of the medulla and cerebral centers.

In the literature, to our knowledge, this is the first report of facial palsy due to cyclopentolate eye drops. According to FactMed information, facial palsy may be due to cyclopentolate eye drops in the patients. FactMed provides MD-approved analysis to help both patients, researchers, and physicians accurately assess the risk profile for more than 20,000 different pharmaceutical products. The below report offers compiled information from Food & Drug Administration and FactMed user submissions. Between January 2004 and October 2012, 2 individuals taking cyclopentolate hydrochloride reported facial palsy to the FDA. A total of 257 cyclopentolate hydrochloride drug adverse event reaction reports were made with the FDA during this time period.

Physostigmine is the antidote of choice as it readily crosses the blood-brain barrier. Commonly used anticholinesterases such as neostigmine, pyridostigmine, and edrophonium do not cross the blood-brain barrier, and are not useful [6]. We could not use physostigmine due to non-availability in two patients.

In conclusion, we present two different side effects associated with cyclopentolate eye drop in children. These cases highlights the importance of caution to be exercised while using cyclopentolate hydrochloride in children. Physicians should be well aware of pharmacological agents and use them carefully.

Compliance with Ethical Standards

Written consent was obtained from the relatives of the patients.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

Financial Disclosure

There is no financial disclosure

References:

1. Bhatia SS, Vidyashankar C, Sharma RK, Dubey AK. (2000). Systemic toxicity with cyclopentolate eye drops. Indian Pediatr, 37:329-331.
2. Pooniya V, Pandey N. (2012). Systemic toxicity of topical cyclopentolate eyedrops in a child. Eye (Lond), 26:1391-1392.
3. Tripathi SK, Mondal TK. (1990). Systemic toxicity with cyclopentolate eye drop. J Indian Med Assoc, 88:266.
4. Büyükcam A, Celik HT, Korkmaz A, Yurdakök M. (2012). Myoclonic seizure due to cyclopentolate eye drop in a preterm infant. Turk J Pediatr, 54:419-420.
5. Fitzgerald DA, Hanson RM, West C, Martin F, Brown J, Kilham HA. (1990). Seizures associated with 1% cyclopentolate eye drops. J Paediatr Child Health, 26:106-107.
6. Brown DV, Heller F, Barkin R. (2004). Anticholinergic syndrome after anesthesia: a case report and review. Am J Ther, 11:144-153.

DOI:10.31579/2692-9422/093