



Case Report

Systemic toxicity in a child after topical cyclopentolate eye drops application

Abhinay Ashok¹, Y. Manoj Bhat¹

¹Department of Ophthalmology, Parvathy Mahabala Shetty Eye Hospital, Udupi, Karnataka, India.

*Corresponding author:

Abhinay Ashok,
Department of Ophthalmology,
Parvathy Mahabala Shetty Eye
Hospital, Udupi, Karnataka,
India.

drabhinay.ashok@gmail.com

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ABSTRACT

An 8-year-old girl was seen in our ophthalmology OPD who had come with complaints of mild pain in both eyes for 1 month. Her unaided vision in both eyes was 6/6. Her weight was 20 kg. Cyclopentolate 1% eye drops was administered twice to the child at 5 min interval in both eyes. The child became restless after 30 min of installation of eye drops installation. She started behaving abnormally and was not allowing to do retinoscopic examination. She had altered behavior, visual hallucination, and difficulty in walking. She was disoriented with slurred speech. She had ataxia and frequent tightening of limbs with jerky movements and was plucking her hair. Her pulse rate was 90/min and blood pressure was 120/90 mm of Hg. Her oxygen saturation was 94% in room air. The child was shifted to nearby hospital where a paediatrician and anesthesiologist were available and was kept under observation. Child's pulse, blood pressure, and oxygen saturation were monitored for the next 5 hours. The child recovered completely over the next 8 hours.

Keywords: Dilating drops, Adverse effects, Central nervous system side effects, Paediatric, Ophthalmology

INTRODUCTION

Cyclopentolate is one of the most common drops used in paediatric age group during eye examination to remove accommodation (cycloplegia) and to dilate (mydriatic). It is a muscarinic antagonist. It is used for diagnostic, refractive evaluation, and some procedures in children. Systemic absorption of the drug occurs through transconjunctiva or through vascular mucosa of nasolacrimal duct.^[1] Some amount of drug might enter nasolacrimal system and may be swallowed and absorbed through stomach.

Adverse effects are very rare and occur only in about 5% of the cases. Tachycardia and central nervous system (CNS) are affected. Restlessness, psychosis, hallucination, incoherent speech, and ataxia are few of CNS effects. Seizures might occur in severe cases.^[2,3] Presenting a case report where a child had an acute CNS manifestation following instillation of cyclopentolate. The CHILD recovered completely after 8 h.

CASE REPORT

An 8-year-old girl came to our OPD with complaints of mild pain in both eyes for 1 month. Her unaided vision in both eyes was 6/6. Anterior segment was normal, undilated posterior segment evaluation showed normal fundus. Her body weight was 20 kg. She was alert and well oriented.

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Cyclopentolate 1% eye drops were administered to both her eyes at the interval of 5 min. After 30 min of installation of the drops, she underwent retinoscopic examination. She was very restless by then and was not allowing retinoscopic examination. She was disoriented, altered behaviour, and had slurring of speech. She was throwing things. She had tightening of limbs with jerky movements and as plucking her hair. Tried to calm her down and put her to sleep but she was restless. Her pulse rate was 90/min and blood pressure was 120/90 mm of Hg. Her oxygen saturation was 94% in room air. The child was immediately shifted to the nearby hospital where a paediatrician and anaesthesiologist were available and was kept under observation. The child's pulse, blood pressure, and oxygen saturation were monitored for the next 5 h. The child recovered completely over the next 8 h.

DISCUSSION

Cyclopentolate is an anticholinergic (synthetic) agent. It causes cycloplegia and mydriasis and has a rapid onset of action. Onset of action is within 30–60 min and lasts up to a day. Adverse effects are usually uncommon. Adverse effects are dose related and include tachycardia, inappropriate behaviour, auditory, and visual hallucination. CNS effects are due to stimulation of cerebral and medulla centres by the anticholinergic action of cyclopentolate.^[4] Children with low body weight and infants are more prone to systemic adverse effects. A rare adverse effect in adult is also noted – progressive midbrain haemorrhage following cyclopentolate application.^[5] Tachycardia and hypertension are common cardiovascular side effects. Drugs such as beta-blockers and pilocarpine also show similar adverse effects. Supportive therapy is the primary treatment. Midazolam and diazepam are used if the patient is very restless. Antidote of choice is physostigmine as it readily crosses the blood–brain barrier. Anticholinesterases such as neostigmine, pyridostigmine, and edrophonium do not cross the blood–brain barrier.^[6] Physostigmine is used in severe cases who are not responding to other therapies. The child with respiratory failure may require mechanical ventilation.

Precautions to be taken to reduce the systemic side effects include using low concentration of the drug and minimal number of drops (instill one drop of 0.5% or 1% in eye followed by second drop after 5 min interval). Occlude the lacrimal passage after topical administration for 5 min, excess drops can be blotted away after administration, using micro drops (drops with volume of 5.6 microliters as against volume of 35.4 µl of a standard drops) in neonates and infants, cyclopentolate and phenylephrine combination is

preferred to lower cyclopentolate concentration and reduced risk for systemic adverse effects.^[7]

CONCLUSION

Great care is required while administering intraocular drugs to children. Physician should be aware of all adverse effects of drugs which are prescribed routinely so that the desired treatment can be given without delay and without subjecting the patient to unnecessary investigation. The medical and paramedical staff should practice proper method of application of eye drops, especially in children to reduce the systemic adverse effects.

Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

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Conflicts of interest

There are no conflicts of interest.

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