CYCLOPENTOLATE INDUCED PSYCHOSIS IN AN 18 YEAR MALE A CASE REPORT

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Summary

Cyclopentolate is a tertiary amine antimuscarinic used as a mydriatic and cycloplegic. Central Nervous System (CNS) Adverse Drug Reactions (ADRs) of cyclopentolate are mainly due to the central anticholinergic effects and are mainly seen in children. We here by report a case of acute psychosis induced by cyclopentolate in an 18 year old male. An 18 year male with no significant past history presented to our emergency department with complaints of aggressive behavior and excessive talking since 3 hours. The history revealed administration of cyclopentolate eye drops. A diagnosis of cyclopentolate induced psychosis was made. The patient was discharged after providing symptomatic treatment at our hospital. This reaction due to cyclopentolate eye drops is commonly reported in the literature. Though it is commonly seen in children, even adult patients might develop this problem. One should be aware of these effects and should instruct the patients to watch for these symptoms. Upon occurrence, the management of psychotic reactions can be done mainly by Neostigmine. We also established the causality, severity and the preventability of the ADR as per the standard scales.

Keywords: Cyclopentolate, Psychosis.

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Introduction

Cyclopentolate is a tertiary amine antimuscarinic used as a mydriatic and cycloplegic. The common side effects associated with cyclopentolate are related to increased intraocular pressure and burning sensation [1]. Central Nervous System (CNS) side effects due to cyclopentolate are well reported in the literature. These reactions are mainly due to the central anticholinergic effects [2] and are mainly seen in children. We here by report a case of acute psychosis induced by cyclopentolate in an 18 year male. We also established the causality, severity and preventability assessments of the psychotic reaction as per the Naranjo scale [3], Hartwig scales [4] and the Modified Schummock and Thornton scales [5] respectively.

Case report

An 18 year male with no significant past history presented to our emergency department with complaints of aggressive behavior and excessive talking since 3 hours. Prior to visiting our hospital, the patient was taken to a local hospital for his complaints and was given Inj. Promethazine following which the patient became drowsy. The patient was then referred to our hospital for further management. On examination, the patient was drowsy and irritable, obeyed the commands, moving all four limbs and there was no evidence of facial asymmetry. The vital parameters were stable.

Upon history taking it was found that the patient was put on cyclopentolate eye drops by an Optholmologist in a private hospital for evaluation of defective vision. Patient was evaluated in our hospital for both clinical and biochemical signs of the present symptoms. His central nervous system examination was unremarkable. His biochemical parameters were with in normal limits; Calcium: 9.2 Mg/dL; Random blood sugar: 122Mg/dL; Sodium: 144mmol/L; Potassium 4.0 Meq/ L; Albumin: 4.2 gms/dL. He was kept on for observation with no recurrence of symptoms. Since the history suggested strong evidence between the administration of Cyclopentolate eye drops and development of acute aggressive symptoms, a diagnosis of Cyclopentolate induced psychosis was made.

The patient was discharged after 24 hrs with counseling. Patient is on regular follow up with no recurrence of similar symptoms. The patient was not rechallenged as the reaction was a severe one.

Upon reporting the ADR to the Pharmacovigilance cell, the Pharmacists carried out the Causality assessment, severity assessment and preventability assessment of the ADR as per the Naranjo scale, Hartwig scale and the Modified Schummock and Thornton scales respectively. The causality assessment revealed the ADR to be ‘Probably’ associated with the drug. Similarly the severity assessment revealed the ADR to be ‘Moderate Level 4 (b)’ suggesting that the ADR is the reason for hospital admission. It was found that the ADR was ‘not preventable’.

Discussion

Systemic side effects due to topical drugs always pose a challenge to the clinicians. Cycopentolate is a commonly used cycloplegic in the ophthalmology settings. It has got distinct advantages over atropine. Cyclopentolate produces cycloplegia within 30 to 60 minutes with recovery of accommodation usually occurring within 6 to 24 hours, whereas, maximum cycloplegia with atropine usually occurs within several hours of administration, although effective cycloplegia may occur in 30 to 40 minutes. The mydriatic action of atropine may persist for up to 10 days while the cycloplegia may last for as long as 5 days. Therefore, cyclopentolate is more convenient to use for the ophthalmologist, and is more attractive to the patient [6].

The systemic effects due to cyclopentolate are well reported in the literature. The various systemic side effects of this drug includes tachyarrhythmia, vasodilatation, ataxia, confusion, seizure, psychotic disorder etc [6]. The psychotic reactions are related to the central anticholinergic effects of cyclopentolate. Acute psychotic reactions characterized by visual, auditory, and tactile hallucinations, disorientation, confusion, amnesia, and aggressive behavior have been reported following ocular administration of cyclopentolate [7,8].

A group of authors have described Central Anticholinergic Syndrome (CAS) due to cyclopentolate in a 4 year old child [2]. One researcher studied the systemic toxic effects of 2% cyclopentolate eye drops in 66 adults. Out of these, 10 developed systemic toxic reactions. In 6 cases it was mild and in the remaining 4 cases the severity was moderate. All these cases recovered without any treatment [9].

The management of psychotic reactions is done mainly by Neostigmine.[2] It is preferred because it can travel across the Blood Brain Barrier (BBB) as it is a tertiary amine. At the CNS, neostigmine blocks the action of cyclopentolate thus relieving the psychotic symptoms. Other commonly used drugs such as pyridostigmine, and edrophonium are quaternary amines and hence may not be able to cross the BBB successfully [2].

In order to avoid systemic side effects due to cyclopentolate eye drops, finger pressure should be applied to the lacrimal sac during and for 1-2 minutes following topical instillation of the solution, particularly if the 2% solution (higher concentration) is used and especially in children [1].

Carrying out the causality assessment using standard methods is one of the best ways to establish the causal relationship between drug and effect. The Naranjo algorithm [3] is used widely in carrying out the causality assessment of ADRs. It is based on the score calculated on the basis of points given for each of ten questions that comprises the table. In our case, the causality assessment revealed that the ADR to be ‘probably’ attributed to cyclopentolate.

In order to take appropriate initiatives towards management of the ADR, it is necessary to study the severity of the ADRs. Hartwig scale [4] is widely used for the purpose. This scale categorizes the reported adverse drug reactions into different levels as mild, moderate or severe based on the treatment and whether or not hospitalization was required for the management of the ADRs. In our patient, the ADR was found to be of 'Moderate Level 4 (b)' suggesting that the ADR is the reason for hospital admission.'

The preventability assessment provides an idea to find whether a particular ADR could be preventable. A commonly used scale for this purpose is the Modified Schumock and Thornton scale [5]. In our case this ADR was found to be 'not-preventable.'

Conclusion

Since cyclopentolate is a commonly used cycloplegic drug, one should be aware of the CNS side effects due to this drug. Upon occurrence of these side effects, one should treat it as a medical emergency and treat it as per the standard guidelines. The patients prescribed with this drug should be also counseled regarding the possibility of these side effects and should be told to apply finger pressure to the lacrimal sac during and for 1-2 minutes following topical instillation of cyclopentolate eye drops.

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