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(CASE REPORT)

Acute Confusional State Induced by Systemic Absorption of Topical Tropicamide in an Elderly Patient: A Case Report

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Abstract

Tropicamide is a widely used antimuscarinic agent, frequently employed to induce mydriasis for diagnostic or therapeutic purposes. Although administered topically, systemic absorption is possible and can lead to a spectrum of adverse effects, including central nervous system disturbances. We report the case of an 80-year-old male with a history of type 2 diabetes who developed an acute confusional syndrome accompanied by psychomotor agitation following the excessive instillation of tropicamide eye drops. Following symptomatic treatment with tranquilizers and close clinical observation, the patient experienced a complete recovery. This case underscores the importance of monitoring for central anticholinergic toxicity when using topical ophthalmic agents, particularly in the geriatric population.

Keywords: Tropicamide; Confusion; Toxicity; Anticholinergic

1. Introduction

Tropicamide is an anticholinergic compound routinely utilized in ophthalmic practice to provoke mydriasis and cycloplegia. While its local efficacy is well-established for diagnostic and therapeutic ocular procedures, systemic passage of the drug is a documented phenomenon capable of inducing various systemic disorders[1,2]. Among these complications, the onset of an acute confusional syndrome—often representing central anticholinergic toxicity—is a rare but significant clinical event. The following case report details an instance of severe confusion and agitation in an elderly patient following tropicamide instillation, highlighting the diagnostic process and clinical management.

2. Case Presentation

We report the case of an 80-year-old male patient who was brought to the emergency department for the acute onset of confusion and agitation. His past medical history was significant for type 2 diabetes mellitus, which was currently managed with insulin therapy. According to the history obtained, the patient's symptoms developed a few hours after the excessive instillation of tropicamide-based eye drops, which had been administered to achieve mydriasis for a diagnostic examination. Upon admission to the emergency department, the physical examination revealed a severely confused and agitated patient. Hemodynamic evaluation noted a heart rate of 85 beats per minute, presenting as tachycardia in this clinical context. Ophthalmic examination confirmed the presence of bilateral mydriasis. The remainder of the comprehensive clinical examination was unremarkable. To rule out organic causes of his acute altered mental status, a brain computed tomography (CT) scan was performed, which returned strictly normal results. Furthermore, a comprehensive biological workup, including metabolic panels, was normal, effectively excluding diabetic emergencies such as acute hypoglycemia. Given the clinical presentation, the patient was therapeutically managed with tranquilizers (chlorpromazine) to control his psychomotor agitation. He was subsequently admitted to

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the observation room for continuous clinical monitoring. The clinical evolution was highly favorable, characterized by the complete disappearance of the confusional state and a full return to his baseline level of consciousness. This systemic recovery was paralleled by the resolution of the bilateral mydriasis. Based on the sequence of events and the exclusion of differential diagnoses, the diagnosis of confusional syndrome secondary to tropicamide overdose was formally retained.

3. Discussion

Tropicamide is a synthetic organic anticholinergic agent belonging to the anti-muscarinic family. When administered via ocular instillation, one of its primary pharmacological effects is the dilation of the pupil, making it an essential tool for funduscopic examinations and other intraocular evaluations. Despite its targeted topical application, systemic bioavailability remains a clinical concern. During instillation, the tropicamide solution is transported via the nasolacrimal duct into the highly vascularized nasal mucosa and the digestive tract[2,3]. This route allows the medication to bypass first-pass hepatic metabolism, potentially provoking systemic anticholinergic effects, especially in cases of overdosage[2,3]. The scientific literature frequently describes a range of systemic adverse effects associated with anticholinergic eye drops. These effects are predominantly neurological and psychiatric in nature. Classic manifestations of this toxicity include confusion, agitation, hyperexcitability, and visual or auditory hallucinations. The geriatric population is notably vulnerable to these central nervous system effects due to an age-related decrease in cholinergic reserves, altered pharmacokinetics, and a higher susceptibility to drug-induced delirium[4–6]. Management of such acute toxic episodes is largely supportive, as observed in this case[7]. Ensuring patient safety through observation and careful administration of sedatives generally leads to a spontaneous resolution of symptoms once the pharmacological agent is metabolized[7]. To prevent such occurrences, simple clinical techniques, such as applying pressure to the medial canthus (nasolacrimal occlusion) and wiping away excess drops during instillation, are highly recommended to minimize systemic mucosal absorption[2].

4. Conclusion

Systemic toxicity from topical tropicamide, though uncommon, can precipitate severe neurological and psychiatric symptoms, particularly in the elderly[4,6]. Healthcare professionals must remain vigilant regarding the risk of anticholinergic confusional syndrome and prioritize preventive instillation techniques to optimize patient safety during routine ophthalmic evaluations.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declare that they have no competing interests relevant to the content of this article.

Statement of ethical approval

Ethical approval was not required for this case report as it describes a single patient's clinical presentation and management without any experimental intervention.

Statement of informed consent

The patient provided informed consent.

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