

Hypertensive Urgency Following Topical Phenylephrine 2.5%

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Abstract

Topical phenylephrine, an alpha-1 adrenergic receptor agonist, is commonly used to induce pupillary dilation. While generally considered safe, there are reports of systemic effects even with topical administration. This case report details a 66-year-old female who experienced hypertensive urgency following the administration of topical phenylephrine 2.5% combined with tropicamide 1% during a routine diabetic eye examination. The patient, with a medical history of hypothyroidism managed with Levothyroxine, presented with chills and a sensation of cold shortly after administration of phenylephrine. Her blood pressure increased to 212/103 mmHg, followed by further elevated readings and the onset of chest pain, necessitating emergency medical intervention. In the emergency department, a cardiac workup revealed no significant findings, and the patient was treated for hypertensive urgency and diagnosed with an allergic reaction to phenylephrine. This case highlights the potential for severe systemic reactions to topical phenylephrine, emphasizing the need for vigilance and preparedness in managing such adverse events in clinical practice. Documentation and awareness of these rare but significant side effects are crucial for ensuring patient safety and improving drug safety profiles.

Keywords: Topical Phenylephrine; Hypertensive Urgency

Introduction

Topical phenylephrine is widely utilized in ophthalmology and optometry clinics to induce pupillary dilation for fundoscopic examinations [1]. Comprehensive ocular assessments enable eye care specialists to evaluate the retina, optic nerve, and associated posterior ocular structures. Such evaluations are indispensable for the early detection of numerous ocular pathologies, including diabetic retinopathy, glaucoma, retinal detachment, and macular degeneration, frequently before the onset of clinical symptoms. For individuals with diabetes, regular dilated examinations are of paramount importance, as they facilitate the identification of incipient diabetic retinopathy, allowing for timely intervention and management [2].

The common practice of applying topical phenylephrine to facilitate mydriasis is generally considered to have a favorable safety profile; however, caution must be used with its use, as with all pharmacologic agents. Following the ocular administration of such pharmacologic agents, it is crucial to recognize and manage the potential side effects of the medications used. Phenylephrine, an alpha-1 adrenergic receptor agonist, can cause systemic effects even when administered topically. Its vasoconstrictive properties can lead to increased blood pressure, especially peri-operatively, where it can find its way to the systemic circulation.

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Here, we present a case of hypertensive urgency following the administration of phenylephrine 2.5% combined with tropicamide 1%. This case is notable due to the occurrence of hypertensive crisis after topical administration, an uncommon route for such reactions. Previous reports of hypertensive crises linked to phenylephrine typically involve systemic exposure during surgical procedures involving tissue incision or when multiple drug agents are used [3,4].

Report of a Case

A 66-year-old female presented for a routine diabetic eye examination. Five minutes post-administration of topical phenylephrine 2.5%, the patient experienced chills and a sensation of cold. Following the patient's presentation, her blood pressure was recorded in the clinic at 212/103 mmHg. The patient's pertinent past medical history included hypothyroidism, managed with daily Levothyroxine Sodium 50 mcg, with no other chronic conditions. This history was corroborated by her primary care physician.

In the clinic, the patient was instructed to rest supine and minimize movement and speech. She was provided with blankets, and her blood pressure was monitored every five minutes, yielding subsequent readings of 217/97, 193/92, and 219/87 mmHg, with heart rates between 53 and 62 bpm and an oxygen saturation of 98%. Approximately 25 minutes after the onset of symptoms, the patient reported new-onset left shoulder and chest pain. Given the new symptoms and persistent hypertensive readings, emergency medical services were contacted, and the patient was transferred to the emergency department.

In the emergency department, a cardiac workup, including EKG, troponin I, and creatine kinase-myocardial band (CK-MB) assays, along with blood glucose monitoring, yielded unremarkable results. The patient received intravenous treatment for blood pressure control and was diagnosed with an allergic reaction to phenylephrine.

Discussion

Although rare, hypertensive emergencies following topical phenylephrine administration can lead to severe outcomes, including end-organ damage. It is imperative for all medical practices to be aware of these uncommon adverse events.

The importance of identifying dangerous side effects of medications extends beyond immediate patient care. Proper documentation and reporting of such incidents contribute to the broader understanding of drug safety profiles and can lead to improved guidelines for medication use. In this case, the patient's severe reaction to a commonly used ophthalmic medication underscores the need for vigilance in all medical settings, even those considered routine and generally accepted as safe practice.

Phenylephrine, while effective for pupillary dilation, carries risks that must be carefully considered. Its mechanism of action as an alpha-1 adrenergic agonist can cause systemic vasoconstriction, potentially leading to systemic hypertension, reflex bradycardia, and, in severe cases, cardiovascular complications. Additionally, caution should be exercised in patients with cardiovascular disease, hyperthyroidism, or those taking monoamine oxidase inhibitors [5]. The 2.5% concentration used in this case is generally considered safer than the 10% formulation, yet this incident demonstrates that adverse reactions can still occur with lower concentrations [3]. Healthcare providers should be aware of potential contraindications for phenylephrine use. In case of adverse side effects, treatment options that can be administered include intramuscular epinephrine for anaphylaxis management and clonidine or captopril for managing hypertensive urgencies [6].

Conclusion

This case underscores the importance of vigilance when using topical phenylephrine despite its generally safe profile. Being aware of uncommon side effects can lead to the timely diagnosis and management of potentially life-threatening conditions. This case also emphasizes the need for a comprehensive approach to patient care, balancing the benefits of diagnostic procedures with potential risks.

Healthcare providers should be prepared to recognize and manage adverse reactions promptly, ensuring patient safety while conducting necessary examinations.

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