



Brief report

Adverse drug events leading to emergency department visits at an eye hospital: A brief report

Safa Alizadeh ^{a,*}, Niayesh Mohebbi ^b, Kheirollah Gholami ^c, Mahmoud Jabbarvand ^d

^a Tehran University of Medical Sciences, Tehran, Iran

^b Department of Clinical Pharmacy, Faculty of Pharmacy, Tehran University of Medical Sciences, Tehran, Iran

^c Research Center for Rational Use of Drugs, Tehran University of Medical Sciences, Tehran, Iran

^d Eye Research Center, Farabi Eye Hospital, Tehran University of Medical Sciences, Tehran, Iran

Received 24 November 2016; revised 16 January 2017; accepted 29 January 2017

Available online 3 March 2017

Abstract

Purpose: To evaluate adverse drug events (ADEs) resulting in emergency department visits in an eye hospital.

Method: Emergency department visits at Farabi Eye Hospital were assessed for a 7-day period. The patients' eye disorders and drug history were evaluated to detect ADEs.

Results: Of 1631 emergency visits, 5 (0.3%, 95% CI: 0.13–0.71%) were drug related. Tetracaine eye drops accounted for 4 (80%, 95% CI: 38–96%) cases with corneal involvement. The other case was an intense conjunctival injection due to naphazoline eye drops.

Conclusion: ADEs should be considered in differential diagnosis of ocular emergency problems and preventive measure should be considered. Copyright © 2017, Iranian Society of Ophthalmology. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Keywords: Emergency department; Eye hospital; Ocular adverse drug reactions

Introduction

An adverse drug event (ADE) is a noxious or harmful effect of medications. It is estimated that the incidence of ADEs is approximately 1.7–25.1% at general hospitals. They also result in patient admission with a frequency of 2.0–21.4%.^{1,2} Knowledge improvement regarding ADEs is essential.³ This will reduce the prevalence, morbidity, and burden of ADEs through early detection and better management of adverse reactions.^{4,5}

Many drugs such as bisphosphonates, topiramate, vigabatrin, quetiapine, retinoids, ethambutol, amiodarone, chloroquine and hydroxychloroquine, tamoxifen, celecoxib, medications used for erectile dysfunction and even herbal medications, are known for their ocular toxicity.^{6,7}

Drug induced ocular events are the second common reason for official complaints against ophthalmologist.⁸ Acute ADEs resulting in emergency department visits have a high prevalence.⁹ Emergency department admissions due to ADEs are costly and require more health services.¹⁰ The aim of this study was to evaluate the prevalence of ADEs in an ophthalmic specific emergency department in Iran.

Methods

Patients admitted to the emergency department of the Farabi Eye Hospital during 7 days were included. The demographic data, main complaint and present illness, and past medical and drug history of the patients were reviewed. An ophthalmologist and a pharmacist reviewed the diagnosis to find ADE related problem. The national yellow card for the adverse drug reactions (ADRs) was completed for ADE patients. The causality assessment of each ADR was categorized as certain, probable/likely, possible, unlikely, conditional/

* Corresponding author. Farabi Eye Hospital, Qazvin Sq, Tehran, Iran.

E-mail address: Alizadeh.safa@yahoo.com (S. Alizadeh).

Peer review under responsibility of the Iranian Society of Ophthalmology.

unclassified, unassessable/unclassifiable based on the World Health Organization (WHO) criteria.¹¹ Preventability was assessed using the Schumock and Thornton scale.¹² The seriousness of ADRs was assessed by the WHO definition.¹¹

Results

In general, 1631 emergency department visits were recorded. The reason for admission was ADEs in 5 patients (0.3%, 95% CI: 0.13–0.71%). Bilateral but generally asymmetric ocular involvement was found in four of the cases. Four ADEs were caused by tetracaine eye drops (80%, 95% CI: 38–96%). The first patient was a 25-year-old man who had conjunctival injection, corneal edema, and punctate epithelial keratitis in his left eye, one day after inappropriate tetracaine drops administration without a prescription (Fig. 1 A). The causality assessment was “possible”. The second case was a 50-year-old man in whom an epithelial defect, infiltration, and punctate epithelial erosion was observed in both eyes, 3 days after using tetracaine drops to control ocular pain after welding without prescription. The causality assessment was “probable”. Case 3 was a 66-year-old man with an epithelial defect and corneal edema resulting from the use of tetracaine drops without prescription for 1 day to relieve ocular discomfort following welding. The WHO causality assessment of this ADE was “probable”. Case 4 was a 46-year-old man with the complaints of bilateral ocular pain, epiphora, and photophobia. On examination, corneal decompensation with anterior stromal scar formation and neovascularization was found. The right eye had non-healing epithelial defect (Fig. 1 B and C). The problem was caused by tetracaine administration without prescription for 2 days to alleviate foreign body sensation in his eyes. This patient had a history of eye hospital admission for tetracaine ocular adverse effects two years ago. This ADE was the only serious ADR in this study. The causality was “certain”. The last patient overused naphazoline eye drops for

one month although it was prescribed only for 5 days to treat red eye, resulting in intense injection and hyperemia. Because all 5 patients abused their ocular drops without a prescription, the ADEs were preventable.

Recovery was the outcome of four ADEs. Only case 4 underwent penetrating keratoplasty on the left eye. None of the patient used any other medications simultaneously.

Discussion

The evaluation of ADEs in this report revealed that ophthalmic medications could result in emergency department visits. Other studies have shown that emergency department visits due to drug reactions are very frequent and troublesome^{13,14} and most ADEs resulting in emergency department visits are not properly diagnosed.⁹

- Proper diagnosis and management of ophthalmic ADEs may reduce ocular complications. As the most prevalent cause of ADE in our study was tetracaine, it seems that education about the hazards of tetracaine drops is necessary both for the pharmacies and the subjects at risk.
- Most problems about the local anesthetic eye drop use occurred with self-administration of the drop without physician supervision. This drug may be abused, resulting in corneal complications like corneal opacification, infection, corneal perforation, and visual loss. Local anesthetics may induce a wide range of ophthalmic problems from keratitis to permanent visual acuity reduction.¹⁵ Restriction availability of tetracaine drop without prescription is essential.

This study was performed during a short period of time. Therefore, the incidence of ADEs may be higher. Further long-term studies are recommended to explore the true incidence of the ADEs.

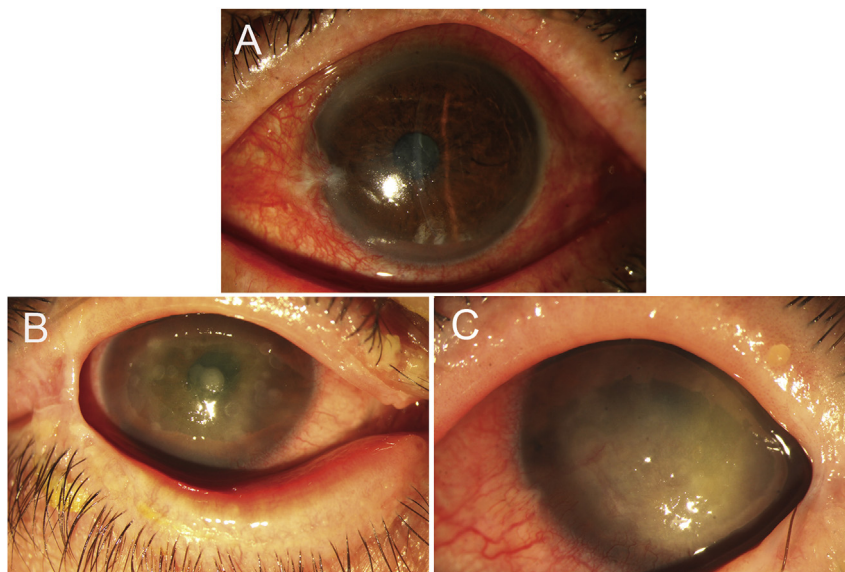


Fig. 1. A) Conjunctival injection, corneal edema, and punctate epithelial keratitis in the left eye of a patient with tetracaine drop abuse; B) and C), Corneal edema (corneal decompensation), anterior corneal stromal scar, and neovascularization due to tetracaine abuse for sensation of foreign body.

References

1. Einarson TR. Drug-related hospital admissions. *Ann Pharmacother.* 1993; 27(7–8):832–840.
2. Lazarou J, Pomeranz BH, Corey PN. Incidence of adverse drug reactions in hospitalized patients: a meta-analysis of prospective studies. *JAMA.* 1998;279(15):1200–1205.
3. Van Grootheest K, Olsson S, Couper M, de Jong-van den Berg L. Pharmacists' role in reporting adverse drug reactions in an international perspective. *Pharmacoepidemiol Drug Saf.* 2004;13(7):457–464.
4. Gallelli L, Ferreri G, Colosimo M, et al. Retrospective analysis of adverse drug reactions to bronchodilators observed in two pulmonary divisions of Catanzaro, Italy. *Pharmacol Res.* 2003;47(6):493–499.
5. Wu WK, Pantaleo N. Evaluation of outpatient adverse drug reactions leading to hospitalization. *Am J Health Syst Pharm.* 2003;60(3):253–259.
6. Li J, Tripathi RC, Tripathi BJ. Drug-induced ocular disorders. *Drug Saf.* 2008;31(2):127–141.
7. Santaella RM, Fraunfelder FW. Ocular adverse effects associated with systemic medications : recognition and management. *Drugs.* 2007;67(1): 75–93.
8. McGee HT, Fraunfelder FW. Toxicities of topical ophthalmic anesthetics. *Expert Opin Drug Saf.* 2007;6(6):637–640.
9. Hafner JW, Belknap SM, Squillante MD, Bucheit KA. Adverse drug events in emergency department patients. *Ann Emerg Med.* 2002;39(3):258–267.
10. Hohl CM, Nosyk B, Kuramoto L, et al. Outcomes of emergency department patients presenting with adverse drug events. *Ann Emerg Med.* 2011; 58(3):270–279.
11. Mjörndal T, Boman MD, Hägg S, et al. Adverse drug reactions as a cause for admissions to a department of internal medicine. *Pharmacoepidemiol Drug Saf.* 2002;11(1):65–72.
12. Schumock GT, Thornton JP. Focusing on the preventability of adverse drug reactions. *Hosp Pharm.* 1992;27:538.
13. Budnitz DS, Shehab N, Kegler SR, Richards CL. Medication use leading to emergency department visits for adverse drug events in older adults. *Ann Intern Med.* 2007;147(11):755–765.
14. Zhan C, Arispe I, Kelley E, et al. Ambulatory care visits for treating adverse drug effects in the United States, 1995–2001. *Jt Comm J Qual Patient Saf.* 2005;31(7):372–378.
15. Epstein DL, Paton D. Keratitis from misuse of corneal anesthetics. *N Engl J Med.* 1968;279(8):396–399.