

Original Article

Management of traumatic corneal abrasion by a sample of practicing ophthalmologists in Saudi Arabia



Ghadah S. Al-Saleh; Abdullah M. Alfawaz *

Abstract

Purpose: Corneal epithelial defect (CED) is a common medical emergency condition involving loss of surface epithelial layer of the cornea. The aim of the study is to explore the practice patterns of ophthalmologists in management of traumatic CED in Saudi Arabia and to assess the variance in clinical practice from the established clinical practice guidelines.

Methods: A Survey based study at King Abdulaziz University Hospital between March 2015 and January 2016. A survey of 16 relevant closed ended questions was distributed to 300 practicing ophthalmologists including Saudi Ophthalmology Society (SOS) members and non-members. The survey questionnaire focused on the known aspects of traumatic CED management.

Results: 188 practicing ophthalmologists responded to the distributed questionnaire. That represents a 63% response rate for the present survey study. The age group most commonly affected by traumatic CED is 6–18 years old (61.2%). Fingernail trauma (n = 129, 68.6%) was the major cause of CED reported by respondents. In large CED (>5 mm) most common modality of treatment is pressure patching with topical antibiotics with or without cycloplegics (40.4%) whereas in small CED (<2 mm) topical antibiotics and cycloplegics is the preferred way (40.4%). The most commonly used prophylactic antibiotic was second-generation fluoroquinolons (58.5%).

Conclusions: Present study demonstrates that practicing ophthalmologists are reporting that traumatic CED mostly affects young people and fingernail trauma is the major cause. There is lack of clear institutional guidelines and consensus on the management of traumatic corneal abrasions.

Keywords: Corneal abrasion, Corneal epithelial defect, Ophthalmologist, Fingernail trauma, Antibiotic, Cycloplegic

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Introduction

Corneal epithelial defect, (CED) also known as corneal abrasion, is defined as loss of the surface epithelial layer of the cornea. Approximately 10% of the visits to eye emergency unit are having CED.¹ In a study done by Alotaibi et al. 19.6% (277 patients out of 1422) of patients who visited ophthalmology emergency department in Riyadh, Saudi Arabia in one month were found to have traumatic CED.² It

is also reported that CED is a common medical condition that is frequently encountered by primary care physician and is a major cause of referral to Ophthalmologist.³ CED is characterized by acute ocular pain, tearing, red eye, blurred vision, and photophobia that affect patients' quality of live.⁴ Although it is usually healed with no visual sequels, ocular complications may happen including corneal ulcer, scarring, and melting specially if not correctly managed.⁵ Cycloplegics, topical non-steroidal anti-inflammatory drugs

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(NSAIDs), eye patches and topical antibiotics are reported modalities of treatment.⁶ However, there exists variability in the amount of evidence supporting any of these modalities.

In a study done in UK, British investigators found that there is variability in CED management among practicing ophthalmologists.⁷ Similarly there is lack of consensus on the treatment of traumatic corneal abrasions among Canadian emergency physicians.⁸ It is not known whether similar variability exists in practicing ophthalmologists in Saudi Arabia. Our objective was to study the corneal abrasion management practices among Saudi ophthalmologists. Our hypothesis was that we would find variability in traumatic CED management, and if there is need for clear standard guidelines for treating these cases and future randomized controlled trials defining effective treatment methods.

Methodology

Study design: A survey based study for the management of traumatic corneal abrasion.

Place of study: Departments of Ophthalmology, King Abdul-Aziz University Hospital, Riyadh, Saudi Arabia between March 2015 and January 2016. Ethical approval was provided by the King Saud University Institutional Review Board (15/0083/IRB).

Methods

After conducting pilot testing on a sample of practicing ophthalmologists, sixteen relevant closed ended questions survey were distributed to 300 practicing ophthalmologists, including Saudi Ophthalmology Society (SOS) members and non-members. The survey questionnaire focused on the known aspects of traumatic CED management. We used both web based and hard copy questionnaires to conduct the study for 3 months from March 2015 to April 2015. The survey was conducted to determine cause, diagnosis, and management of CED by the Ophthalmologists. The questions were based on general information, evaluation and specific management.

Data analysis

In the present study, the data was analyzed using Excel 2007. Data was sorted based on similarity and matching. Further, grouped data was presented as diagram/histogram. Data was also presented in table format using word pad 2007.

Results

The response rate was 188 of 300 (response rate is 63%) which is in line with the previous average response rate of 64% in the literature.⁹ Among the various grade of professionals involved in the present survey management study, 68 (36.2%) Ophthalmology consultants, 30 (16.0%) Ophthalmology fellow or specialists and 67 (35.6%) ophthalmology residents and others 23 (12.2%) that included registrars, senior registrars and service residents.

In regards to type of practice, 164 (87.2%) responders were practicing at tertiary care eye hospitals and 24 (12.8%) were practicing in general hospital or private clinics.

The evidence based clinical practice was adopted by the highest number of the Ophthalmologists (n = 83, 45.10%) followed by personal knowledge (n = 68, 36.95%), written guidelines in the institution (n = 22, 11.95%), instruction from senior staff (n = 12, 6.52%) respectively as shown in Fig. 1. The data analysis for the cause of CED indicated that fingernail trauma (n = 126, 68.47%) was the major cause followed by contact lens trauma and the commonest age group (n = 140, 75.6%) affected by traumatic CED is less than 18 years old (Table 1).

One hundred and fifty-five (82.4%) practicing ophthalmologists highly depended on the size of abrasion in choosing the way of managing traumatic CED. Upon stratification of data on the size of the CED i.e. small (>2 mm), medium (2–5 mm) and large (>5 mm) size of CED, the most common treatment approach was topical antibiotic and cycloplegic eye drop for all the three sizes of CED. Eye pressure patching with topical antibiotic with or without cycloplegic eye drop were the first choice for treatment in the large CED Fig. 2. Whereas, in the small CED, topical antibiotics and cycloplegic eye drops was the first choice of treatment. In terms of the management approach taken by professional status; contact lens use was preferred by consultants in comparison with in-training ophthalmologists (13 Vs 5). Moreover, usage of topical antibiotics and cycloplegic eye drops was more common in ophthalmologists in-training group Fig. 3.

The most commonly used prophylactic antibiotics were second generation fluoroquinolones (n = 110, 58.5%) Table 1. Fifty-seven practising ophthalmologist (30.3%) never prescribe NSAIDs for CED patients.

Discussion

Physician surveys are an important tool to assess attitudes, beliefs and different management strategies especially when clear evidence based practice is lacking. Corneal abrasion accounts for a significant proportion of the ophthalmic workload of most emergency departments. In the present survey study, most responses came from Ophthalmologists practicing at tertiary care eye center (87.2%) where different levels of practicing physicians may encounter those patients. This increases the importance of exploration of practice at these hospitals especially the common daily practice. Also, the age group most commonly affected by this type of trauma is young age group (<18 years of age) in our survey study. This is in agreement with previous reports which suggested that this age group is the group most likely to be affected in the various populations.^{6,10,11} This is another important reason to consider while standardizing the care since those patients are in their early life and mismanagement may result in poor outcome which impacts the patients themselves and the community. Our survey study revealed that fingernail trauma is the major cause of CED in Saudi Arabia population. This is corroborated with similar studies in American population where Fingernail-induced CED was one of the most common causes for eye injuries.^{12,13} This type of trauma is a known risk for fungal corneal ulcer which should be kept in mind in following those patients.

Corneal abrasion is also a common problem encountered by physicians in general emergency departments and in primary care practices. Treatment recommendations vary and include the use of topical antibiotics, cycloplegic drops, and

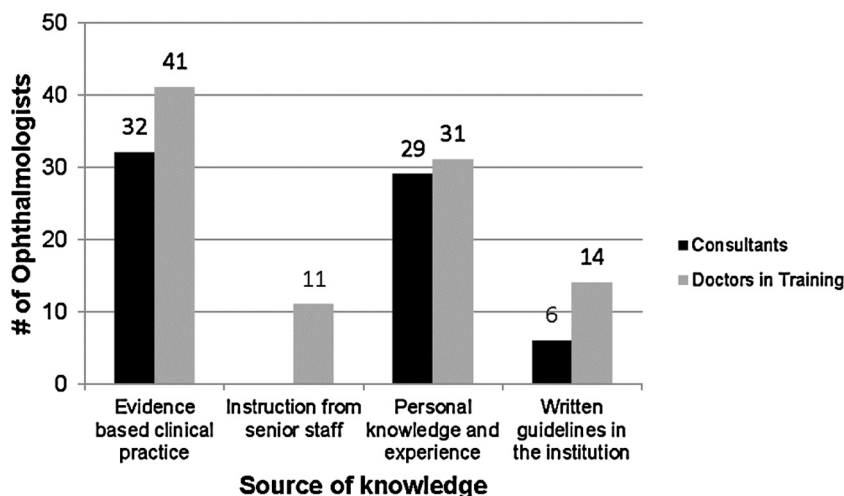


Fig. 1. Source of knowledge in management of traumatic corneal abrasion by professional status.

Table 1. Descriptive statistics.

Variable	N (%)
<i>Practicing places</i>	
Tertiary Eye hospitals	164 (87.2)
General hospitals	24 (12.8)
<i>Age group most affected (years)</i>	
1-5	25 (13.3)
6-18	115 (61.2)
>18	47 (25.0)
<i>Cause of corneal abrasion</i>	
Fingernail trauma	129 (68.6)
Contact lens related	25 (13.3)
Superficial foreign body	19 (10.1)
Trauma during hammering	7 (3.7)
Others	8 (4.3)
<i>First choice of topical antibiotics used</i>	
Second generation fluoroquinolones (e.g. ciprofloxacin, ofloxacin)	110 (58.5)
Third generation fluoroquinolones (eg. moxifloxacin, Gatifloxacin)	48 (25.5)
Chloramphenicol	8 (4.3)
Erythromycin	6 (3.2)
Gentamycin	5 (2.7)
Others	6 (3.2)
<i>Considering the size of traumatic epithelial abrasion in management</i>	
Yes	151 (80.3)
No	37 (19.7)
<i>Dealing with pain associated with trauma</i>	
Always	74 (39.4)
Never	6 (3.2)
Occasionally	37 (19.7)
Rarely	20 (10.6)
Usually	52 (27.7)
<i>Topical NSAIDs</i>	
Always	6 (3.2)
Never	57 (30.3)
Occasionally	97 (51.6)
Rarely	18 (9.6)
Usually	10 (5.3)

eye pressure patching. In our survey study, the evidence based clinical practice (n = 83, 45.10%) was the main source of knowledge among participants followed by personal knowledge and experience (n = 68, 36.95%). In our opinion and in absence of clear consensus of treating this common

type of ocular trauma, institutional guidelines should be implemented to avoid any diversity of treatment that may affect the outcome.

Our findings suggest that eye pressure patch with topical antibiotic and cycloplegia was the most commonly used modality of treatment in large CED (40.4%). Until now eye pressure patching is perhaps the most controversial issue in the treatment of CED.^{10,14-18} In Kaiser et al.'s study of 223 patients with traumatic CED secondary to direct corneal trauma or removal of superficial corneal foreign body, patients in the no patching treatment arms reported significantly less pain at 24 h (P < 0.01) as well as a greater difference in pain score at 24-h follow up compared with presentation (P < 0.05) for both etiologies.¹² A randomized clinical trial for management of abrasion in children aged between 3 and 17 years old who were having isolated corneal abrasion and patient were picked randomly for patching and not patching. The study had concluded that patching in children with corneal abrasion showed no difference in the rate of healing.¹⁷ Another study at Sydney eye hospital for evaluating the efficacy of three modalities of treatment in reducing the abraded area, the three groups were as follows: (1) pressure patching with ofloxacin ointment (patch group, PG, n = 18), (2) therapeutic contact lens with ofloxacin eye drops (contact lens group, CLG, n = 20) and (3) ofloxacin ointment alone (ointment group, OG, n = 28). The result showed that treating patient by pressure patching, a bandage contact lens or ointment were equal in reducing the abrasion area or reducing the pain.¹⁵ They concluded that treatment of traumatic corneal abrasions may be adapted to the needs and preferences of the patient. However, in a survey done among ophthalmic units in the UK, even in absence of reproducible scientific evidence, eye pressure patching remains the mainstay of CED management.⁷ That would explain why, in our paper, the majority of practicing ophthalmologists claim that they were following evidence based medicine in managing patients yet pressure patching is still not an evident treatment modality. In fact, no patching can be more preferred because of potential risk of amblyopia especially in children below six years of age.

Although evidence is lacking, topical antibiotics are commonly prescribed to prevent bacterial superinfection. In the current literature there are few studies investigating the use

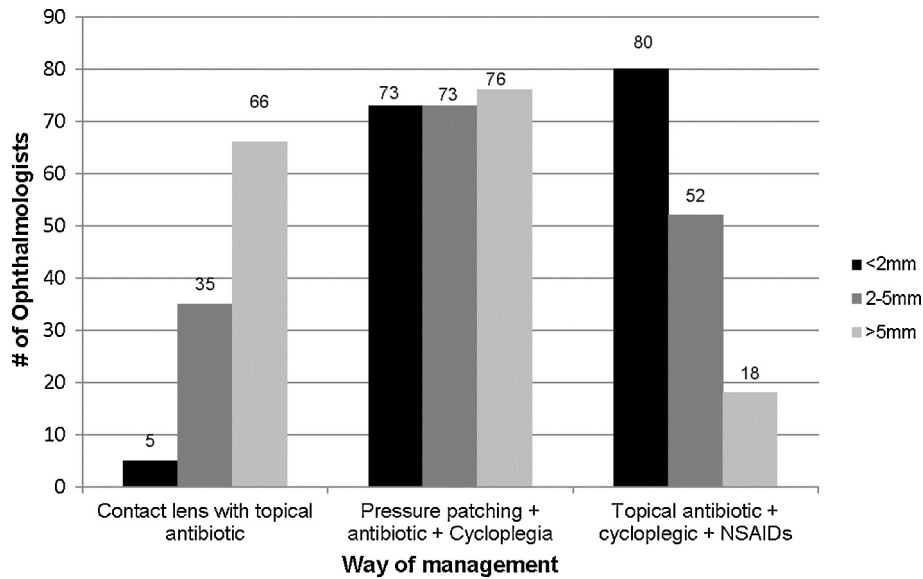


Fig. 2. Choice of Management approach in corneal abrasion cases.

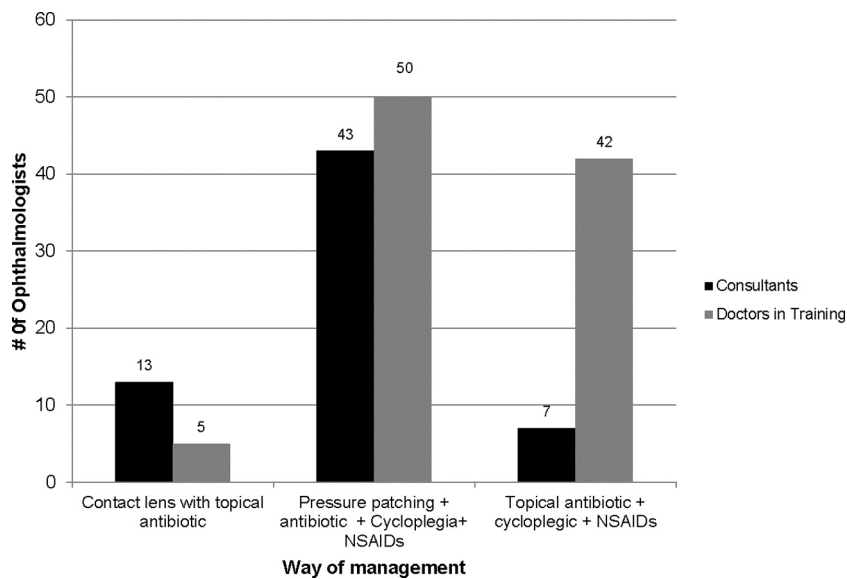


Fig. 3. Choice of Management approach by professional status.

of prophylactic topical antibiotics in traumatic CED. King and Brison¹⁵ studied 270 patients who had traumatic corneal abrasions, 64% of these cases were having corneal foreign bodies. None received topical antibiotics, and the documented infection rate, with 90% follow-up, was 0.7%. They concluded that prophylactic topical antibiotics are not indicated for traumatic corneal abrasions. Contact lens wearers would be exception of that conclusion since they are more prone to *Pseudomonas* infected corneal ulcers.¹⁹ Given that most of our survey respondents prescribed topical antibiotics routinely for corneal abrasions, the most commonly used antibiotic in our survey was second fluoroquinolones (58.5%) which has good coverage for both gram positive and negative bacteria. Second generation fluoroquinolone is one of the reported topical antibiotics by other researchers.¹⁵

Pain is a major complaint among traumatic CED patients. Available treatment modalities to control CED associated

pain include cycloplegics, bandage contact lens (BCL) use, patching, topical nonsteroidal anti-inflammatory drugs (NSAIDs), and oral analgesics. The amount and quality of evidence supporting the use of these modalities are varied. As far as various drop regime (including cycloplegics), the interventions were varied, therefore no specific regime was recommended in the literature.²⁰ The use of cycloplegics is common practice for the treatment of corneal abrasions. However, there is no good evidence to support this.²¹

In a study done by Brahma et al. patients treated for corneal abrasion in a five-month period were randomly allocated to one of four treatment groups: polyvinyl alcohol (Liquifilm tears, Allergan) alone (control), homatropine 2%, flurbiprofen 0.03%, or homatropine 2% followed by flurbiprofen 0.03%. Patients treated with flurbiprofen had significantly lower pain scores for the 24 h duration of the study than controls ($P < 0.05$).²⁰

Acheson et al.²¹ investigated the pain experienced by patients with large traumatic CED. Patients were treated with topical antibiotic and cycloplegics and randomized to receive an occlusive pad and bandage (group I) or standard size BCL (group II). Pain was significantly less at follow up in group II ($P < 0.05$). Another study showed no benefit in pain scores with oral analgesia use.²² On the other hand, treatment with topical diclofenac 0.1% led to significantly less pain reported when compared with placebo.^{23,24} The suggested mode of action of topical NSAIDs is to suppress prostaglandins effect of corneal tissues hence will reduce the sensitivity of the pain receptors.²⁴ Also, the use of a topical NSAID has been shown to be beneficial in reducing pain following excimer laser photorefractive keratectomy (PRK).²³ In spite of this our results showed that responders use cycloplegics as mainstay of pain management followed by oral analgesia. Topical NSAIDs is considered in management of CED patients in only 69.6% of practicing ophthalmologists. This may be related to the fear from corneal perforation that was reported from use of topical NSAIDs. Although this potential risk is more in post-surgical cases, chronic use, and presence of other ocular comorbidities (eg, conjunctivitis and superficial keratitis).²⁵

Conclusion

In conclusion, present survey management study demonstrates that young people are the group mostly affected by traumatic CED and fingernail trauma was found to be a major cause. Although the majority of responders claim that they follow evidence based medicine in managing these cases, there are still contradicting results of current evidence; namely use of eye patching and uncommon use of topical NSAIDs. The study results have proven the need to have clear written evidence based institutional guidelines to manage such an important emergency condition. Additionally, there is need for randomized clinical trials on the efficacy of different treatment modalities of traumatic CED.

Conflict of interest

The authors declared that there is no conflict of interest.

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