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Research Article

Pattern of Common Eye Diseases Presented to the Emergency Unit of Al-Jaber Hospital in Alhasa

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Abstract

Opthalmic conditions include a range of conditions that impede the visual system. These conditions are usually reported in the emergency department at the emergency unit. However, due to the high influx of patients, the practitioners at the emergency department (ED) may be unable to respond promptly to emergency cases thereby putting the patient at risk. This study examines the actions taken at the emergency department at the Al Jaber Eye Hospital in Alhasa. The study reveals that a majority of the cases received in the ED were non-emergent cases. Few of the ocular emergencies that required immediate attention included ischemic optic neuropathy, artery occlusion of retina, retinal detachment, acute third nerve palsy amongst others. Non-emergent conditions are not fatal and may not last long. On the other hand, if the emergent conditions are not addressed, the patient faces the risk of developing complications.

Methodology: Research was done using the quantitative research. Data was collected by the use of secondary resources such as hospital patient data sheet. This was borrowed from the hospital administration. The results were analysed through the use of Chi-square and Fisher exact test and presented by the use of tables and graphs.

Results: This study found that most of the patients suffering from ED were between ages 11 - 30. Inflammation cases were the most prevalent followed by traumatic conditions and lastly the generative disorders. Also, majority of the reported conditions accounted for Allergic conjunctivitis and viral conjunctivitis, followed by Chalazion and Blephritis.

Conclusion and Recommendations: The study advocated the reduction of patients flowing to the ED as a strategy for improving the quality of care. Through a reduction in patient inflow, the care practitioners will be able to reduce waiting time, and respond promptly to the emergency cases. Also, the care practitioners will be in a better position to control infections. One proposed strategy for achieving this goal includes diverting non-emergent cases to the outpatient department. Also, the general practitioner could treat a majority of the non-acute problems. The study also proposes an ophthalmic triage that would utilize a patient's history and complaints to determine the degree of urgency. The triage system will enable the department to deliver care efficiently. The study also proposes training of the General Practitioner (GP) in a bid to improve the quality of care.

Keywords: *Eye Diseases; Emergency Unit; Chalazion; Blephritis; Allergic Conjunctivitis; Viral Conjunctivitis*

Introduction

Ophthalmic emergencies include a range of conditions that impede the visual system. These conditions include age-related muscular degeneration, ischemic optic neuropathy, and other common eye and visual conditions. The Al-Jaber Hospital in Alhasa is specialized in dealing with ophthalmic emergencies. The ophthalmology emergency department at the hospital provides 24/7 eye emergency care. The

unit provides care for a diverse range of urgent and emergent eye problems on a daily, walk-in basis. At the ER unit, the morning shifts are occupied by a specialist. However, in the evening and night shifts, the unit is held by residents. The unit receives a high number of patients a day. However, staff to patient ratio is an issue as the hospital is experiencing a staff shortage. The low workers in the emergency unit present a significant problem as it exposes the patients to risks of infection as there is no superintendence. The patients may receive poor quality care owing to the shortage of nurses.

The Emergency Department

An emergency department in a hospital is where patients receive acute care without making any previous appointments. Here emergency and non-emergency conditions are received. The staff working in the ED (Emergency Department) faces the pressure of increasing patient volume, overcrowding, increasing complexity, patient boarding, and challenges in maintaining high-quality patient care [1]. The care practitioners are required to engage in the assessment and treatment of pain, infection control and prevention, emergency preparedness, and safe use of medication. Failure to address emergency conditions may lead to severe conditions such as the permanent visual loss. People are at risk of different eye injuries depending on the activities they engage in, jobs, the use of protective equipment, and the environment [1]. People may experience trauma-related injuries such as corneal abrasion, foreign bodies entering the eye, or other eye emergencies such as glaucoma. The outcome of these conditions differs if the patient gets treatment on time.

The ED is responsible for infection control. The staff needs to develop appropriate policies and procedures such as [2] Health care practitioners should wear gloves when coming into possible contact with conjunctiva.

- Equipment should be cleaned, including the tonometer. They should also be regularly disinfected. For instance, the tonometer needs to be thoroughly cleaned to prevent chemical keratitis.
- In the event of an outbreak, unit doses of ophthalmic solutions are recommended for use.

The unit needs to have adequate equipment and workers. Nurse staffing levels have an impact on patient quality of care [3]. The shortage of staff increases the nurse workload and job satisfaction and decreases total patient care overall. Furthermore, inadequate nursing staff enhances the risk of practicing unethically leading not only to adverse patient outcomes but increasing nurse burnout [3]. Hospitals that enhance their staff often worry about the impact on their finances. The hospital administration should, however, not worry about the effects of increasing staff ration as it decreases the time spent on patients.

The ophthalmic department requires a comprehensive range of optical/ophthalmological equipment which is mostly non-portable. This equipment includes the equipment needed to undertake an examination of the lacrimal drainage apparatus, surgical equipment for minor eyelid procedures, disease-specific equipment, and latest IT equipment. Most of the cases presented in the ED are non-emergencies [4]. These conditions can appropriately be managed by outpatient departments or potentially managed by primary health care providers. The most common ocular conditions include:

- Ocular trauma and inflammation
- Conjunctivitis
- Dry eyes and eyelid infections
- Foreign body in eyes
- Glaucoma
- Corneal abrasions
- Subconjunctival haemorrhage

On arrival at the department, the patients are booked and taken through the triage. After booking, the nurse assesses the patient. All patients are triaged by a nurse upon arrival and prioritized in order of clinical urgency. The eye casualty staffs strive to see the patients as soon as possible. However, waiting times are longer due to the staff shortage. In some cases, the patients may require dilating drops to be

administered for diagnostic and treatment purposes. It can be challenging for nurses and other relevant opticians to handle ophthalmic conditions as many acute conditions can be vision threatening [5].

There is a need for strict regulatory and policy implementations at the ophthalmology department. The recommendations will prevent the abuse of and improper utilization of emergency equipment [4]. Also, a well-designed public education program is needed to promote good ocular hygiene to prevent infections and promote a proactive maintenance of the ocular region.

Method

A retrospective study was carried out in Al Jaber Eye Hospital with patient data of the month of May 2017. The data was taken from the medical records of the emergency unit after obtaining an informed consent to explore the pattern and aetiology of eye diseases presenting to the emergency ophthalmic unit of the hospital. All cases reported to the unit were taken into account without any inclusion or exclusion criteria. The cases reported in the emergency unit's medical records were then classified broadly into three categories.

a) Based on the type of reported conditions (emergency and non-emergent cases) and
b) The subspecialty, where the diagnosed cases were referred for further management.
c) Types of conditions were further categorized based on the diagnostic characteristics as follows:

I. Trauma.
II. Inflammation.
III. Degenerative disorders.
IV. Other ocular modifications.

Statistical Analysis

All the categorical data were represented by frequency with percentage, and it was analyzed by Chi-square and Fisher exact test. Continuous data were presented by mean with Standard deviation and it was tested the significant difference by using ANOVA test. All the analysis was done by using STATA 14.0 version. A P value less than 0.05 were considered as significant.

Results

During the period of study, a total of 4,809 cases were reported to the ED of the hospital. The two categories of diagnosis, demographics and the action taken to deal with the cases are presented in the table 1. Of these 43.8% (n = 2110) were males and 56.1% (n = 2699) were females. Among the reported cases the maximum number of patients, n = 1568 (32.6%) were from the age group 11-30 and there were only 1 case (0.02%) reported above the age of 90.

Characteristics	N (%)
Age in years (N = 4809)	
< 10	1354 (28.1)
11 - 30	1568 (32.6)
31 - 50	1252 (26.0)
51 - 70	505 (10.5)
71 - 90	129 (2.6)
> 90	1 (0.02)
Gender	
Male	2110 (43.8)
Female	2699 (56.1)
Diagnosis grouped	1952 (40.5)
Urgent	2857 (59.4)
Non-Urgent	
Action Taken	
Discharged	4296 (89.33)
Follow-up	26 (0.5)
Referred to specialized clinic	435 (9.0)
Admitted	44 (0.9)
Referred to other Hospital	8 (0.1)

Table 1: *Demographics, diagnosed cases and action taken.*

The reported cases of ED were categorized into Urgent and non-Urgent, of which 40.5% (n = 1952) were the real Urgent cases which require immediate attention and 56.1% (n = 2857) of the caseload were non-Urgent cases. Of the cases attended by the ophthalmologists 89.33% (n = 4296) of the patients were discharged; 0.5% (n = 26) were required further follow-up; 9.0% (n = 435) and 0.9% (n = 44) were referred and admitted for further procedures (Table 1). Eight cases (0.1%) were referred to other specialized hospital for treatment.

The cases were categorized into four based on diagnostic characterization namely trauma, inflammation, degenerative disorders and other ocular conditions. Figure 1 illustrates the diagnostic characterizations, of all reported cases, of which 1009 cases were accounted as traumatic conditions, 2348 cases were inflammations, 69 degenerative disorders and 1383 cases of other ocular conditions.

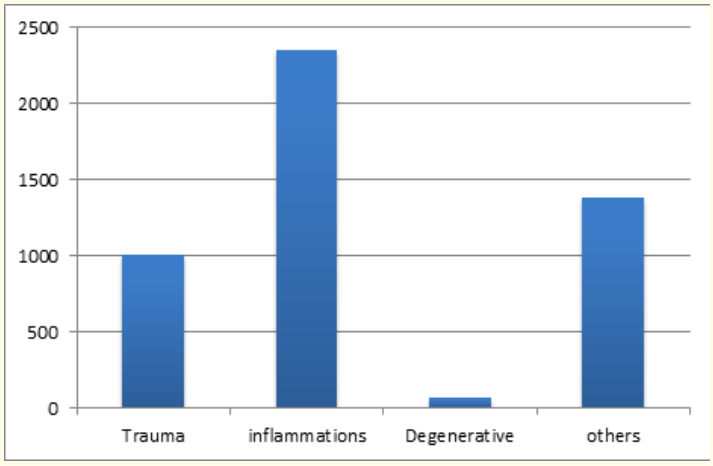

Figure 1: *Diagnostic characteristics.*

Analysis of reported traumatic conditions (Table 2) indicates that 60.6 % (n = 612) of cases were corneal abrasions, whereas sub-conjunctival haemorrhage accounted for 13.6% (n = 138), followed by foreign body in cornea with 7.5% (n = 76) of the cases and the remaining traumatic conditions were of marginal in number.

Diagnosis	n (%)
Corneal abrasion	612 (60.6)
Sub-conjunctival haemorrhage	138 (13.6)
Foreign body in Cornea	76 (7.5)
Hematoma in lid	18 (1.7)
Chemical burn	66 (6.5)
Traumatic Retinal detachment	5 (0.4)
Traumatic uveitis	4 (0.3)
Foreign body under eyelid	36 (3.5)
Lid laceration	18 (1.7)
Corneal Ulcer	26 (2.5)
Conjunctival tear	10 (0.9)
Total	1009

Table 2: *Listing of trauma cases (n = 1009).*

Majority of conditions accounted for Allergic conjunctivitis n = 570 (24.2%) and Viral conjunctivitis 19.2% (n = 452), followed by 13.1% cases of Chalazion (n = 312) and Blephritis 9.0% (n = 212).

Diagnosis	n (%)
Viral conjunctivitis	452 (19.2)
Neonatal conjunctivitis	5 (0.2)
Allergic conjunctivitis	570 (24.2)
Blephritis	212 (9.0)
Chalazion	312 (13.1)
Microbial keratitis	18 (43.0)
Trachoma	4 (13.2)
Stye	152 (6.47)
Preseptal cellulitis	10 (0.4)
Traumatic conjunctivitis	22 (0.9)
Toxic conjunctivitis	2 (0.08)
Herpes Simplex virus	4 (0.17)
Vernal keratoconjunctivitis	4 (0.17)
Bacterial conjunctivitis	266 (11.3)
corneal abscess	1 (0.3)
Episcleritis	22 (0.9)
Anterior uveitis	14 (0.5)
Dacrocystitis	7 (0.2)
Mucopurulent conjunctivitis	210 (8.9)
Traumatic Iritis	16 (0.6)
Blebitis	2 (0.08)
Contact lens related	26 (1.1)
Pyogenic granuloma	2 (0.08)
Hyphema	2 (0.08)
Keratoconjunctivitis Sicca	8 (0.3)
Canaliculitis	2 (0.08)
photophthalmia	2 (0.08)
Retinitis pigmentosa	1 (0.3)
Total	2348

Table 3: *Inflammation and infection (n = 2348).*

Of the degenerative disorders reported in the ED, the majority, 82.6% (n = 57) were cataracts, followed by Pterygium which is accounted for 8.6% (n = 6) and with 5.7% (n = 4) of congenital cataracts, followed by other degenerative disorders which are less than 5% (Table 4).

Diagnosis	N (%)
Cataract	57 (82.6)
Congenital cataract	4 (5.7)
Macular degeneration	2 (2.8)
Pterygium	6 (8.6)
Total	69

Table 4: *Analysis of Degenerative cases (n = 69).*

When the diagnosis of other cases were verified dry eye accounted for 47.8% (n = 662), followed by normal eye examination 11.2% (n = 155) and refractive error accounted for 10.5% (n = 146) of diagnosis (Table 5).

Diagnosis	n (%)
Dry eye	662 (47.8)
Normal eye examination	155 (11.2)
Headache	10 (0.07)
Diabetic retinopathy	8 (0.5)
Proliferative diabetic retinopathy	10 (0.7)
Vitreous haemorrhage	8 (0.5)
vitreous detachment	6 (0.4)
Chronic Glaucoma	16 (1.1)
Refractive error	146 (10.5)
Acute Glaucoma	6 (0.4)
Nasolacrimal duct obstruction	38 (2.7)
Trichiasis	60 (4.3)
Proptosis	4 (0.2)
6^{th} nerve palsy	2 (0.14)
7^{th} nerve palsy	8 (0.5)
3^{th} nerve palsy	2 (0.14)
Optic atrophy	4 (0.2)
Strabismus	14 (1.0)
Entropion	2 (0.14)
Ectropion	12 (0.8)
Haemangioma	2 (0.14)
Eyelid Angioedema	20 (1.4)
Insect bite	20 (1.4)
Punctate epithelial erosions	16 (1.15)
Pseudophakia	14 (1.0)
Recurrent corneal erosion syndrome	6 (0.4)
Superficial punctate keratopathy	60 (4.3)
Eyebrow Furuncle	2 (0.14)
Branch Retinal Venous Occlusion	2 (0.14)
Presbyopia	12 (0.8)
Aphakia	4 (0.2)
Dermoid cyst	1 (0.07)
Artificial eye	2 (0.14)
Corneal dystrophy	10 (0.7)
macular haemorrhage	4 (0.2)
macular edema	4 (0.2)
Ptosis	1 (0.07)
myopic fundus	8 (0.5)
limbic keratopathy	2 (0.14)
Leukocoria for evaluation	1 (0.07)
Post surgery complication	11 (0.79)
Painful blind eye	8 (0.5)
Total	1383

Table 5: *Other cases (n = 1383).*

The four categories of diagnosis were compared with different age groups and were found statistically significant with p value < 0.05 (Table 6). Reported traumatic conditions were highest among the age group of < 10 years, which accounted for 42.1% (n = 428) and infections/inflammations were high in the age groups < 10 years and 11-30, whereas the age group 51 - 70 were reported with highest number of degenerative disorders. When the diagnosis group consisting of Urgent cases and non-Urgent cases were analyzed, it was observed that 84.5% (n = 853) traumatic Urgent emergencies were reported, but out of the trauma cases 0.7% were recommended for follow-up; 95.7% of cases was not serious enough to admit or follow-up and 2.0% of admissions were related to trauma cases (Table 6).

Parameters	Diagnosis category (number of patients) (%)				P value
	Trauma1009	Inflammation2348	Degenerative69	Others1383	
Age in years					
< 10	428 (42.4)	732 (31.1)	0	196 (14.1)	
11 - 30	283 (28.0)	789 (33.6)	8 (11.5)	490 (35.4)	
31 - 50	199 (19.7)	618 (26.3)	12 (17.3)	423 (30.5)	
51 - 70	95 (9.4)	170 (7.2)	33 (47.8)	207 (14.9)	
71 - 90	4 (0.3)	43 (1.8)	16 (23.1)	66 (4.7)	
> 90	0	0 (4.3)	0	1 (0.07)	< 0.052**
Gender					
Male	552 (54.7)	1408 (59.9)	34 (49.2)	708 (51.1)	
Female	457 (45.2)	943 (40.1)	35 (50.7)	675 (48.8)	0.011**
Diagnosis grouped					
Urgent	853 (84.5)	952 (40.5)	4 (5.7)	145 (10.4)	
Non-Urgent	156 (15.4)	1398 (59.5)	130 (188.4)	1238 (89.5)	0.290**
Action Taken					
Discharged					
Follow-up	966 (95.7)	2234 (95.1)	34 (46.3)	1062 (76.7)	
Admitted	8 (0.7)	2 (0.08)	0	16 (1.1)	
Referred to specialized clinic	21 (2.0)	11 (0.4)	3 (4.3)	9 (0.6)	
Referred to other Hospital	14 (1.3)	101 (10.0)	32 (46.3)	288 (20.8)	< 0.673**
	0	0	0	8 (0.57)	

Table 6: *Distribution by category of diagnosis, age and gender.*

Discussion

This study is detrimental as it focuses on the types of ocular emergencies received in Al jaber's ER unit. It is observed that most of the cases presented in the unit are non-emergencies. Of the total cases reported, less than half of the patient exhibited emergency conditions (40.5%). The remaining (59.5%) were not emergencies. The high influx of emergencies diverts the attention of the caregivers from the real emergencies. The results of the study highlight the need for an effective and safe system that will sort out the non-emergency cases, leaving them to be handled by a trained non-ophthalmologist. Al Samnan., *et al*. [5], observed that the triage system is a safe and effective way of identifying urgent conditions in the department. Triage system is a hospital system of prioritizing the patients need for treatment depending on the severity of their conditions. This system is most applicable for patients that require emergency medical treatment. The triage approach is an effective means of reducing ophthalmic emergency load and waiting time in the unit. The triage ensures patients with urgent conditions are seen first [6]. However, the success of the patient prioritization depends on adequate training of the ophthalmic nurses and adherence to clear-cut guidelines concerning categorization based on the triage approach. Different treatment can be provided by the general practitioners. For instance, trained general practitioners can work on some of the non-emergency cases. In the case of Al Jaber, there was a high dependency on general practitioners in the evening and night shifts without the supervision of a special-

ist. The unit receives approximately, 4,821 a month. Therefore, in an 8-hour shift, a general practitioner is expected to cater to around 57 patients. The results reveal a high number of females (56.1%) visiting the ER majorly due to ocular trauma compared to 43.8% cases involving males.

In the ED, most of the ophthalmic cases were reported to the ocular emergency unit. Most reported patients were self-referred. In terms of age, 32.6% of the patients were between the age 11 - 30 with a high percentage of ocular trauma occurring in children (< 11 years). Extensive research on the high prevalence of ocular trauma among the children cites the vulnerability of children when playing as well as a lack of proper health care facilities to deal with this preventable condition [7]. Studies conducted by Al Mahdi HS., *et al*. revealed a high incidence of ocular trauma in children above five years compared to those below 11. Uni-ocular blindness tops the chart as the leading traumatic injury that disproportionately occurs in childhood [7].

There are two main categories of ophthalmic cases: routine cases, and emergency cases. A majority of the conditions presented in the ER are non-emergent (routine cases). For routine cases, referrals do not need to be made between the hours of 11p.m to 7a.m [8]. Detrimental cases such as corneal abrasions and arc eye also do not need to be referred at that time. This is because although the case is urgent, making a referral at that time does not improve the patients' outcome. Emergent cases on the other hand justify the need for an immediate call to the ophthalmologist regardless of the time of day [8]. There are relatively few ophthalmic conditions that warrant an emergent referral. Some of the conditions that require an emergent referral include: Acute angle closure glaucoma. Suspected central retinal arterial occlusion with onset in the preceding 4 hours, injuries involving chemicals (especially lime), suspected endophthalmitis, especially in a patient with a history of a recent intraocular surgery/injection, suspected globe rupture or penetrating eye injury, suspected intraocular foreign body, third cranial nerve paresis (this condition needs emergent referral to neurosurgery especially if there is evidence of an intracranial aneurysm) [9].

Channa R observed that the leading ophthalmic conditions on a nationwide basis were corneal abrasions (13.7%), the existence of foreign bodies (7.5%). The two conditions were the leading emergency cases [10]. Visits to the ED for conjunctivitis were 28.0%, followed by 3.0% for sub-conjunctival haemorrhages. Similar to Channa's research, our findings reveal a high percentage of corneal abrasions (60.6%). However, foreign body in the eye was (3.5), and viral conjunctivitis was found to be at (19.2%), which is higher than Channa's findings (14%). On degenerative cases, cataract cases were the highest (82.6%).

A major limitation of the study is that it was carried out for one month. As a result, important information on issues such as seasonal variations, particularly on conditions such as conjunctivitis was not observed.

Conclusion

To achieve quality care, it is advisable for the Al Jaber ophthalmic unit to introduce a triage system. This system will facilitate the identification of urgent and non-urgent cases. The non-urgent cases can be referred to general ophthalmic practitioners under the supervision of a specialized ophthalmologist. The reduction of patients flowing in the ER will enable the caregivers to focus on emergency cases thereby reducing waiting time and the risk of infection. The general practitioners can provide different treatment. This presents the need for one highly quality accurate reference to deal with ED cases in diagnosing and treatment.

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