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Etiology Of Red Eye In Outpatient clinic

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2019

بِسمِ اللهِ الرَّحمنِ الرَّحيم

الَّذِي خَلَقَنِي فَهُوَ يَهْدِينِ (78) وَالَّذِي هُوَ يُطْعِمُنِي
وَيَسْقِينِ (79) وَإِذَا مَرِضْتُ فَهُوَ يَشْفِينِ(80)

صدقَ اللهُ العظيم

سورة الشعراء

Dedication

To our wounded and patient country "Iraq".

To our families for their abundant support.

Acknowledgements

I would like to give my deepest gratitude to every person who helped me to complete this research .

My grateful thank to my supervisor (***Dr.*Ahmed Majeed)** for everything he did , still does and for his encouragement and his big help we couldn't have this without him.

Finally special thanks to ***my family*** for their support

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Abstract

Background : Red eye is one of the most common reasons why patients present at the eye clinic. It may be due many causes which could be painfull or painless. It may also be a symptom of a life-threatening condition, and improper diagnosis and appropriate management may result in ocular morbidity or mortality.

Patients&Methods: This cross sectional study included 50 patients who referred to eye clinics of Al-imamain Al-kadhumain Medical city with ocular complaints. A detailed history of patients was recorded and their eyes were examined. Then, pre designed checklists were completed by the researcher.

Results: The most common cause of red eyes was conjunctivitis (30.0%), followed by foreign bodies (14.0%) and trauma (12.0%).The majority of them28 (56.0%) were at the age between 16 and 39 years. Also 28 (56.0%) were male and 22 (44.0%) were female and 32 cases were painfull.

Conclusion and Recommendations: In the current study, the most common causes of red eyes were conjunctivitis, foreign bodies, and trauma respectively. Red eye was more common in males than in females. An appropriate and proper training of risky factors of red eyes in the future could reduce the risk of serious visual problems.

Introduction

Eye redness is the result of the changes in the blood vessels of the eyes and can happen by a dilation of conjunctive vessels, sclera or around sclera (trauma,

chemical burns, immunologic reactions), inflammation reactions (bacterial, viral, fungous) and can happen in one or both eyes [1,2]. Therefore, red eyes are benign in most cases, but sometimes they lead to risky vision abnormalities and even death [3].

To diagnose the causes of red eyes, exact details of the history of patients and a complete examination of the eyes are necessary and treatment should be based on the illness, according to the ophthalmologist's advice. Some questions should be asked while getting the patients' history details such as the involvement of one or both eyes, duration of the symptoms, kinds and amount of ocular secretion, vision changes, intensity of pain, photophobia, previous treatment, systematic diseases or allergic records, using contact lenses, trauma, seasonal or continuous occurrences (Allergic reactions, iris inflammation), using eye drops (glaucoma, eye dryness) [4].

The physical examination of red eyes is essential and includes: vision control, check of the movements of external eye muscles, intra ocular pressure control, evaluation of the depth of anterior chamber, existence of cells or proteins in anterior chamber [5], pupil reaction to light, pupil forms, cornea examination with slit lamp for cornea edema, scratch or abrasion of cornea, eyelid evaluation and tear bag [3,4].

The benign cases of red eyes can be treated by general practitioners but more serious causes of red eyes must be diagnosed and treated by an ophthalmologist immediately [6]. In most cases, red eyes can be cured in primary stages of health care [7]. Appropriate and correct differential diagnoses of red eyes lead to suitable treatments and help in determining needed cases to refer [8]. It is significant to identify threatening factors of vision and those who need to visit the ophthalmologist [9].

When pains are not removed by topical painkillers, the patients must refer to ophthalmologist in cases of needs of topical steroid, vision reduction and weakness of patients, plenty of infectious secretion, cornea involvement, eye injuries after accidents, recent eye surgeries, pupil distortion, and continuous infection [4].

Since eye redness can be the symptom of many ocular diseases ranging from light conjunctivitis to infections and vision threatening diseases and trauma, and because of the significance of the ophthalmological health and the lack of efficient and enough studies in these fields, a research was conducted to determine the causes of red eye in Bu Ali Sina Hospital in Sari, to take effective steps in the treatment of this illness, promote the patient's life style and prevent serious and risky causes and its effects.

Aim of the study

1- To assess the prevalence of etiologies among patients with Red eye.

2- To compare between causes of red eyes among the studied groups.

Methods

This study was descriptive, cross-sectional, conducted on 50 patients formerly referring to the ophthalmological clinics of Al-imamain Al-kadhumain Medical City. The criterion of selection was all the patients with red eyes with no specific limitation. Any patient unable to fill in the forms was excluded. The patient's history details were obtained and the patients were completely examined by the ophthalmologists of the hospital ophthalmological clinic.

The tools needed to perform the examination included the flashlights to examine the pupils, chart snellen to test the vision acuteness, ophthalmoscope, fluorescein paper and slit lamp. The examination included the evaluation of all parts of both eyes, like eyelids and eyebrows, and red eye criterion was the eye color changes and the increase of conjunctive vessels that were determined by observation and examination with slit lamp. In addition, the patient's eye movements and eyesight were investigated and studied.

The probable causes of red eyes were studied in 8 groups, including conjunctivitis (allergic, bacterial or viral), cornea inflammation (keratitis), sclera involvement (scleritis and episcleritis), iris involvement and angle involvement (glaucoma and Uveitis), traumatic causes (foreign bodies and objects, chemical burns and blunt trauma).

Paying attention to the patients' clinical symptoms was helpful to differentiate the types of conjunctivitis. Bacterial causes emerged as infectious secretion. Sudden attacks of periocular lymphadenopathy often showed viral conjunctivitis and allergic conjunctivitis could be diagnosed easily by scratching, watery, and sticky secretion and involved both eyes.

To diagnose glaucoma, an oculist measured the eye pressure. The most common tool to measure the eye pressure is the tonometer. The more the pressure inside the

eyes, the more difficult the cornea leveling and concavity is. The normal pressure inside the eyes is of 10-20 mmHg. More attention should be given so as not to press the eyeball hard with the hands while using the tonometer.

Data collecting tools included the patients' demographic information (age, sex,) and factors concerning red eyes (painful or painless), ocular clinical findings and causes leading to red eyes, initial diagnoses and final diagnosis which were recorded in data forms by interviews and comprehensive ophthalmological examinations. The form content validity was confirmed by Dr. Ahmed Majeed.

The sample size was calculated in 50 people after consulting with the statistical experts and using the statistical formula to get the accuracy of 95% and illness prevalence regarding the previous studies (40%). All the ethical points were considered and the patients were sure that their personal information would be kept secret. The study method was explained to the patients and there was no obligation. No money and charges were requested from the patients. The clinical activities had no risks for patients and there was no performance limitation.

The software SPSS (version 23.0.1) and descriptive statistical tests were used to analyze the data.

Results

Of the 50 patients under study, 28 (56.0%) were male and 22 (44.0%) were female. 10 patients (20.0%) were over 39 years old, 28 (56.0%) between 16 and 39 years old and 12 (24.0%) were under 16 years old.

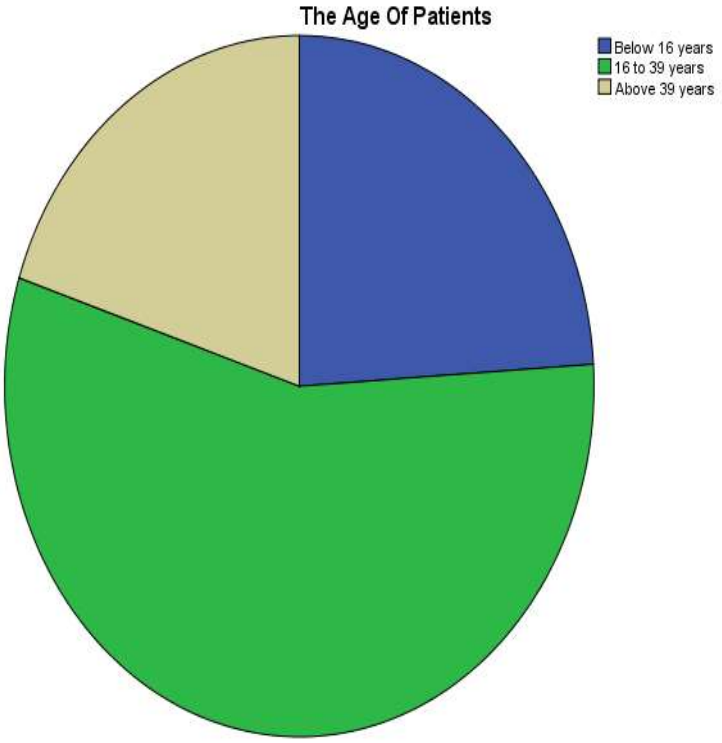

Figure1: the age of patients.

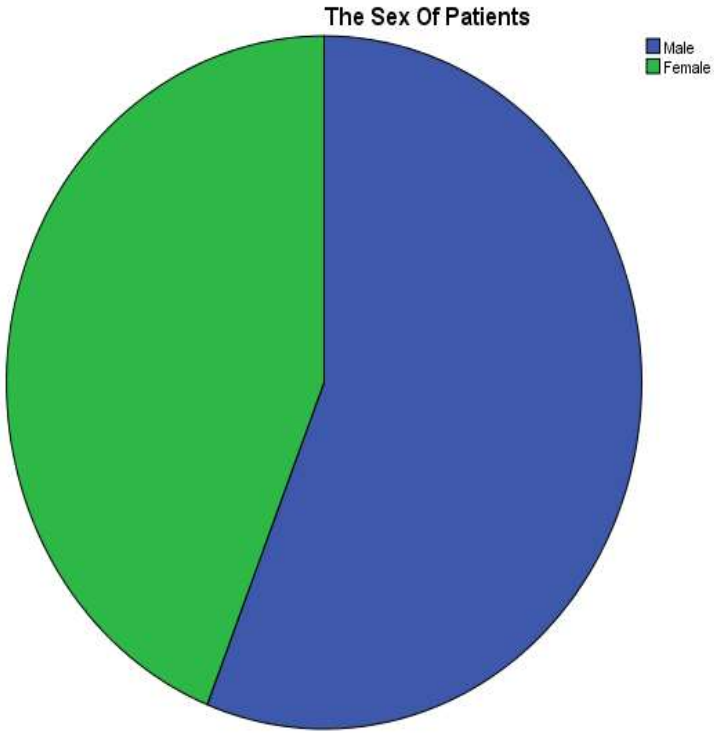

Figure2: the sex of patients.

The causes of red eyes were the following: conjunctivitis (30.0%), foreign bodies (14.0%), trauma (12.0%), keratitis (8.0%), glaucoma (14.0%), Uveitis (8.0%), recent eye surgery (6.0%), and corneal ulceration(8.0%).

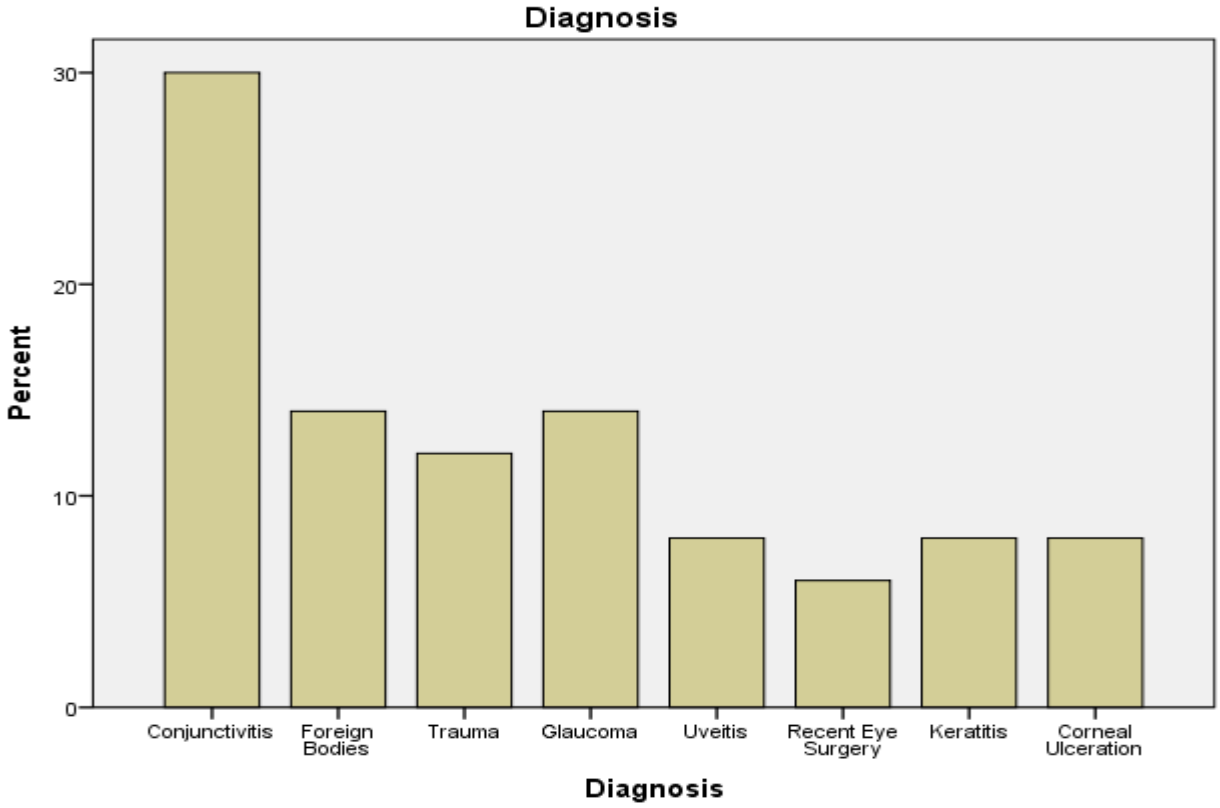

Figure3: Causes of red eye.

Conjunctive causes, foreign bodies, glaucoma, uveitis had a meaningful and significant statistical relation to the patients age, respectively as P<0.0001, P<0.0001, P<0.0001, P<0.0001.

Of the causes of red eyes, conjunctivitis was met in patients below 16 years but predominantly between 16 and 39 years old, foreign bodies in patients between 16 and 39 years (**Table 1**).

Table 1: The causes of red eyes in patients with different age groups

Causes	Below 16	16-39	Above 39	Total	P value
Conjunctivitis	5	10	0	15	<0.0001
Foreign bodies	3	4	0	7	<0.0001
Trauma	0	3	3	6	0.006
Glaucoma	0	4	3	7	<0.0001
Uveitis	4	0	0	4	<0.0001
Recent eye surgery	0	3	0	3	0.08
Keratitis	0	4	0	4	0.09
Corneal ulceration	0	0	4	4	0.07
Total	12	28	10	50	

Table 2: shows painful or painless causes of red eye. There were statistical significance in conjunctivitis, foreign bodies, Glaucoma, Uveitis include <0.0003, <0.0002, <0.0002, <0.0004 respectively.

Table2: painful or painless causes of red eye.

Causes	Painful	Painless	P value
Conjunctivitis	0	15	<0.0003
Foreign bodies	4	3	<0.0002
Trauma	6	0	0.007
Glaucoma	7	0	<0.0002
Uveitis	4	0	<0.0004
Recent eye surgery	3	0	0.08
Keratitis	4	0	0.09
Corneal ulceration	4	0	0.07
Total	32	18	50

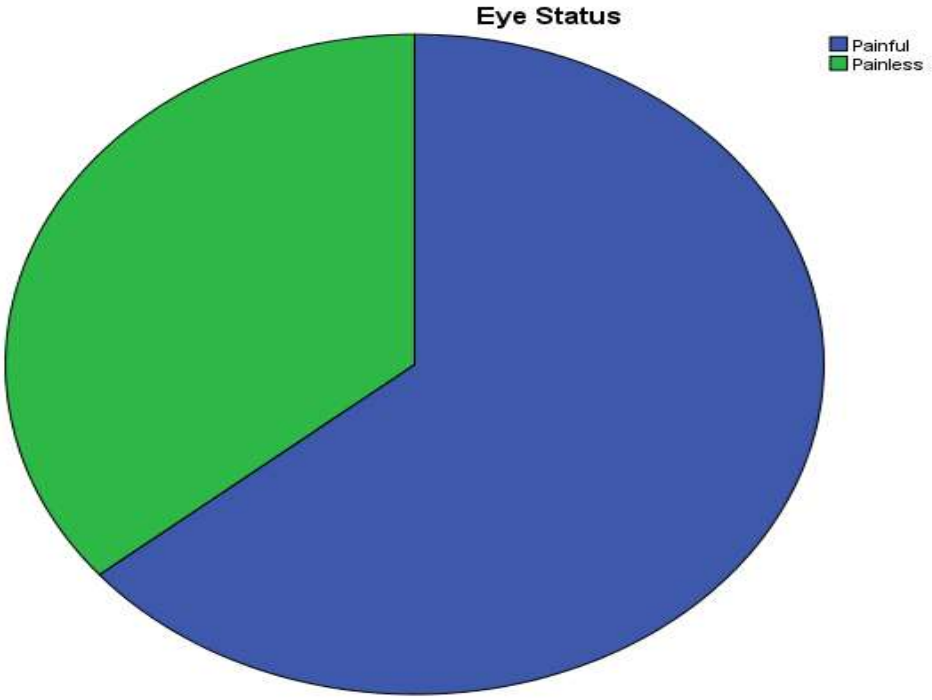

Figure4: Eye symptoms (painful or painless).

Discussion

In this study, the patients were divided into age groups of below 16 year old, 16 to 39 years old and over 39 years old. The age group of 16-39 years old included the largest frequency distribution of 56.0%. The age group divisions were similar to the ones in Besharati and col.'s study (2003), who investigated the causes and prevalence of red eyes among 400 patients with red eyes in ShahidRahnemoon ocular clinic during the summer and winter of 2003, the largest age group (51.5%) being the patients of 16 to 39 years old [10].

In the present study, 50 patients were under study, 28 males (56.0%) and 22 females (44.0%). In Besharati and col.' study (2003), 400 patients were under study, 59% males and 41% females. In Qasemzadehs' study (2010), that investigated red eyes among children in the ocular clinic of Kamkar Hospital, 60% of the patients were males [11]. In Lawan's study (2009), the proportion of men to women was 2 to 1[12].

In this study, the most prevalent cause of red eyes was conjunctivitis (30.0%) and had a significant statistical relationship with age, so it was more often met in patients of 16-39 years old. The results of Besharati and col.'s study (2003), showed that the most prevalent causes of red eyes were the following: conjunctivitis 35.8%, traumatic 22%, and conjunctive degenerative changes (pterygium and pinguecula) 15%. The most prevalent cause of red eyes in both males and females was conjunctivitis and had the largest frequency distribution in the age group 16-39 years old[10].

The results of Qasemzadeh and col.'s study (2010) showed that the largest causes of referring to the clinic were conjunctivitis, trauma, and congenital obstruction of tear meatus, infectious conjunctivitis being the most prevalent cause (56%). There was no significant relationship between gender and red eye causes.

There was no significant statistical relationship between age and sex with the red eye causes [11]. In Lawan's study (2009), the most prevalent causes of red eyes were allergic conjunctivitis (40%), microbial conjunctivitis (17%), corneal abrasion (11%) and inflamed pterygium (11%), respectively [12]. The results of

Cronau's study (2010) showed that conjunctivitis was the most prevalent cause of red eyes and one of the indications of taking antibiotics.

The possible conjunctive causes were infectious (viral, bacterial and Chlamydia) or non- infectious (allergies and stimulants). Most cases of viral and bacterial conjunctivitis were self-limited and had fewer serious effects. Since there was no specific diagnostic test to make a difference between viral conjunctivitis and the bacterial one, in most cases, they were treated by taking broad- spectrum antibiotics. Other prevalent causes were the following: Blepharitis, corneal abrasion, foreign bodies, sub conjunctivitis hemorrhage, keratitis, iris inflammation, glaucoma, chemical burns, and sclera inflammation [4].

In the study undergone by Karki (2003) in Nepal in an ocular hospital during a hemorrhagic conjunctivitis epidemic, on 400 patients with acute conjunctivitis, the most prevalent cause was conjunctivitis - viral and bacterial which were more prevalent than the allergic types. Bilateral or mutual involvement in 73.5% of the patients, cornea involvement in 4.3% of the patients were observed [13]. At the same time, the results of Passaro's study (2002) on 200 university students with red eyes showed that the diagnosis was conjunctivitis epidemic [14]. In Jorm's study (1994) in a boarding school in Sydney, Australia, conjunctivitis was the most prevalent epidemic after diarrhea [15]. In the present study, there was no conjunctivitis epidemic and all the cases referred sporadically.

The second most prevalent cause of red eyes in our study was foreign bodies – 14.0%, more prevalent in ages 16 to 39.

The third prevalent cause was trauma, either sharp (penetrating) or blunt, with a prevalence rate of 12.0%. In Besharati's study (2003), the traumatic cause was the second prevalent cause of red eyes (22%). In his study, the traumatic causes were investigated in three groups: blunt trauma 9%, chemical burns (2.8%) and foreign bodies (10.3%) (2010). In Laroches' study (1998) of 222 patients with eye trauma, 51% had red eyes due to blunt trauma, 28% due to penetrating trauma and 5% due to chemical burns and foreign bodies [16]. In the present study, the prevalence of blunt trauma was less than in Laroche's study, probably because most of the patients with penetrating trauma referred to the emergency departments.

In Nirmalan's study (2004) in India, trauma was the most traumatic cause of red eyes [17]. Blunt trauma had more prevalence than the other trauma types in different studies and its effects varied by study locations, job, lifestyle, and environment factors.

In the present study, there was a significant statistical relationship among red eyes following trauma.

In the study of Jobs (2000) performed on 134 patients with Scleritis and Episcleritis, ocular effects were observed in 13.5% of the patients as Episcleritis and in 58.8% of the patients as scleritis[20]. In present study, no investigation was made on the ocular effects. Moreover, glaucoma had a prevalence of 14.0% that had a significant statistical relationship with age and duration of symptoms and was largely observed in the age group of 16-39 years.

Petricek and Coworkers (2004) made an investigation among ophthalmologists and general practitioners from 9 European and middle eastern countries. Their study results showed that allergic conjunctivitis was the most prevalent diagnosis (35%), then eye dryness (25%) and finally bacterial conjunctivitis (24%) [21].

In the present study, foreign bodies were on the second place, with a frequency distribution of 14.0% and having a significant statistical relationship with gender and age, being more prevalent in males and people between 16 and 39 years old.

Glaucoma was more prevalent in females than in males and in patients over 39 years old.

Red eyes following corneal abrasion were meaningfully more often met in males than in females, with a frequency distribution of 8.0%.

CONCLUSION & RECOMMENDATIONS

- In the current study, the most common causes of red eyes were conjunctivitis, foreign bodies, and trauma respectively. Red eye was more common in males than in females.

- Conjunctivitis was most common cause in age between 16-39 yr. while foreign body was met below 16yr but more in age between 16_39 yr .

- painful causes of red eye were most common than painless causes .

- . An appropriate and proper training of risky factors of red eyes in the future could reduce the risk of serious visual problems.

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Questionnaire

Patient's Age:

Patient's Sex:

Painful or Painless:

Diagnosis: