

Common causes of red eye presenting in northern Iran

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Abstract

Aim. This study aimed to determine the causes of red eye disease among patients of Mazandaran-Northern Iran.

Methods. This cross sectional study included 840 patients who referred to eye clinics 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 eye was conjunctivitis - 30% (252/ 840), foreign bodies 23.2%, trauma including penetrating or blunt 8.6%, respectively. There was a significant relationship between the red eye trauma, with acute onset and duration of less than a week ($P < 0.0001$). Diagnoses of red eye were conjunctivitis in 31.3% of the cases separately, viral causes (19.5%), allergic (7%) and bacterial (4%), foreign bodies 22.9%, pterygium 7%, and trauma 6.5%, respectively.

Conclusion. 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.

Keywords: red eyes, conjunctivitis, diagnosis of red eye

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.

Materials & methods

This study was descriptive, sectional, conducted on 840 patients formerly referring to the ophthalmological clinics of the central hospital. 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), degenerative conjunctivitis changes (pterygium and pinguecula), 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), eye lid diseases (blepharitis, hordeolum, chalazion, and eye lid deformation), tear system involvement (dacryocystitis and eye dryness).

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, job, living place) and factors concerning red eyes (exact red eye location, duration of eye redness from the symptom beginning to the diagnosis of the causes, manner of beginning, symptoms with red eyes, ocular clinical findings and causes leading to red eyes, background diseases (diabetes, hypertension, lipid disorders, thyroid disorder), previous records of red eyes and referring to the doctor, using medicine under the doctor's supervision or optionally, initial diagnoses and final diagnosis which were recorded in data forms by interviews and comprehensive ophthalmological examinations. The form content validity was confirmed by ophthalmological professors.

The sample size was calculated in 575 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%). However, because the patients were easily available, this research was made on 840 patients with red eyes, which increased our study accuracy. 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 20) and descriptive statistical tests were used to analyze the data.

Results

Of the 840 patients under study, 525 (62.5%) were male and 315 (37.5%) were female. 394

patients (46.90%) were over 39 years old, 331 (39.40%) between 15 and 39 years old and 115 (13.69%) were under 15 years old.

The causes of red eyes were the following: conjunctivitis (30.3%), foreign bodies (23.2%), trauma (8.6%), pterygium (7.2%), keratitis (6%), episcleritis (5.5%), glaucoma (2.5%), blepharitis (2.1%), dacryocystitis (2%), Uveitis (1.9%), vessel problems (1.3%), chemical burns (1.1%), touch the UV (0.9%), chalazion (0.5%), scleritis (0.3%), and other causes (5.8%).

Conjunctive causes, foreign bodies, pterygium, glaucoma, dacryocystitis and vessel problems had a meaningful and significant statistical relation to the patients age, respectively as $P < 0.0001$, $P < 0.0001$, $P < 0.0001$, $P < 0.0001$, $P = 0.021$, $P = 0.003$.

Of the causes of red eyes, conjunctivitis was more often met in patients below 16 years old, foreign bodies in patients between 16 and 39 and trauma in patients over 39 (Table 1).

Table 1. The reasons of red eyes in patients with different age groups

| causes | Below 16 | 16-39 | Above 39 | P value |
|-----------------|-------------|-------------|------------|---------|
| Conjunctivitis | 173 (63.5%) | 92 (27.8%) | 90 (22.8%) | <0.0001 |
| Foreign bodies | 7 (6.1%) | 107 (32.3%) | 81 (20.6%) | <0.0001 |
| Trauma | 10 (8.7%) | 28 (8.5%) | 35 (8.9%) | 0.98 |
| Keratitis | 5 (4.3%) | 17 (5.1%) | 29 (7.4%) | 0.324 |
| Pterygium | 0 | 20 (6%) | 41 (10.4%) | <0.0001 |
| Episcleritis | 9 (7.8%) | 15 (4.5%) | 23 (5.8%) | 0.314 |
| Uveitis | 1 (0.9%) | 8 (2.4%) | 7 (1.8%) | 0.56 |
| Blepharitis | 1 (0.9%) | 12 (3.6%) | 5 (1.3%) | 0.055 |
| Dacryocystitis | 2 (1.7%) | 2 (0.6%) | 13 (3.3%) | 0.023 |
| Chemical burns | 1 (0.9%) | 6 (1.8%) | 3 (0.8%) | <0.405 |
| Scleritis | 1 (0.9%) | 0 | 2 (0.5%) | 0.319 |
| Glaucoma | 0 | 0 | 21 (5.3%) | <0.0001 |
| Chalazion | 0 | 173 (0.6%) | 3 (0.8%) | 0.646 |
| Vessel problems | 0 | 0 | 11 (2.8%) | 0.003 |
| UV | | 6 (1.8%) | 2 (0.5%) | 0.104 |
| Others | 5 (4.3%) | 16 (4.8%) | 28 (7.1%) | 0.328 |

The causes of red eyes based on manner of outbreak (acute and gradual) and duration of the symptoms were also investigated (Table 2,3).

Table 2. The reasons for red eyes based on the outbreak manner

| causes | | | P value |
|-----------------|------------|-------------|---------|
| | acute | gradual | |
| Conjunctivitis | 49 (25.9%) | 205 (31.5%) | 0.143 |
| Foreign bodies | 62 (32.8%) | 124 (20.6%) | 0.001 |
| Trauma | 25 (13.2%) | 48 (7.4%) | 0.014 |
| Keratitis | 8 (4.2%) | 43 (6.6%) | 0.229 |
| Pterygium | 6 (3.2%) | 55 (8.4%) | 0.016 |
| Episcleritis | 5 (2.6%) | 41 (6.3%) | 0.067 |
| Uveitis | 4 (2.1%) | 12 (1.8%) | 0.998 |
| Blepharitis | 1 (0.5%) | 17 (2.6%) | 0.092 |
| Dacryocystitis | 0 | 18 (2.8%) | 0.019 |
| Chemical burns | 5 (2.6%) | 5 (0.8%) | 0.051 |
| Scleritis | 0 | 3 (0.5%) | 0.594 |
| Glaucoma | 2 (1.1%) | 19 (2.9%) | 0.191 |
| Chalazion | 0 | 5 (0.8%) | 0.357 |
| Vessel problems | 3 (1.6%) | 7 (1.1%) | 0.702 |
| UV | 3 (1.6%) | 5 (0.8%) | 0.389 |
| Others | 16 (8.5%) | 33 (5.1%) | 0.11 |

Table 3. The reasons for red eyes based on the symptom duration

| Causes | Less than 2 weeks | 1-3 weeks | More than 3 weeks | P value |
|-----------------|-------------------|------------|-------------------|---------|
| Conjunctivitis | 171 (31.1%) | 59 (36.2%) | 24 (18.9%) | 0.005 |
| Foreign bodies | 174 (31.6%) | 20 (12.3%) | 2 (1.6%) | <0.0001 |
| Trauma | 69 (12.5%) | 3 (1.8%) | 1 (0.8%) | <0.0001 |
| Keratitis | 21 (3.8%) | 17 (10.4%) | 13 (10.2%) | 0.001 |
| Pterygium | 9 (1.6%) | 15 (9.2%) | 37 (29.1%) | <0.0001 |
| Episcleritis | 20 (3.6%) | 20 (12.3%) | 6 (4.7%) | <0.0001 |
| Uveitis | 8 (1.5%) | 6 (3.7%) | 2 (1.6%) | 0.181 |
| Blepharitis | 6 (1.1%) | 3 (1.8%) | 9 (7.1%) | <0.0001 |
| Dacryocystitis | 3 (0.5%) | 4 (2.5%) | 11 (8.7%) | <0.0001 |
| Chemical burns | 10 (1.8%) | 0 | 0 | 0.069 |
| Scleritis | 1 (0.2%) | 1 (0.6%) | 1 (0.8%) | 0.488 |
| Glaucoma | 6 (1.1%) | 4 (2.5%) | 11 (8.7%) | <0.0001 |
| Chalazion | 2 (0.4%) | 2 (1.2%) | 1 (0.8%) | 0.432 |
| Vessel problems | 8 (1.5%) | 2 (1.2%) | 0 | 0.395 |
| UV | 8 (1.5%) | 0 | 0 | 0.119 |
| Others | 34 (6.2%) | 6 (3.7%) | 9 (7.1%) | 0.392 |

The suggested diagnoses of red eyes were the following: foreign bodies (22.9%), Viral conjunctivitis (19.5%), Bacterial conjunctivitis (4%), Allergic conjunctivitis (7%), Pterygium (7%), Trauma (6.5%), Conjunctive bleeding (5.1%), Episcleritis (5%), Keratitis (3.3%), Glaucoma (2.9%), Herpes (2.6%), Blepharitis (2.5%), Corneal abrasion (2.3%), Uveitis (2.1%), Dacryocystitis (2.1%), Keratoconjunctivitis (0.7%), Myiasis (0.5%), Chemical burns (1.1%), Chalazion (0.9%), Trichiasis (0.5%) and Scleritis (0.3%).

Most of the diagnoses of foreign bodies in people with red eyes were in male patients living in rural areas, but viral conjunctivitis was more often diagnosed in women living in urban areas. There was a significant statistical relation among the diagnoses of foreign bodies, viral conjunctivitis, Pterygium, Episcleritis, Corneal abrasion and glaucoma to sex (gender), which were the following: $P<0.0001$, $P=0.003$, $P<0.0001$, $P=0.001$, $P=0.017$, $P=0.007$.

There was a significant statistical relationship between the diagnoses of viral conjunctivitis, trauma and dacryocystitis to the place of living ($P=0.018$, $P=0.003$, $P=0.018$).

Among the suggested diagnoses, foreign bodies ($P<0.0001$), viral conjunctivitis ($P<0.0001$), allergic conjunctivitis ($P<0.0001$), Pterygium ($P<0.0001$) and conjunctive bleeding had a significant statistical relationship with age, so foreign bodies, allergic conjunctivitis, corneal abrasion, uveitis, Blepharitis, Myiasis, and Chemical burns were more prevalent in age the group of 16 to 39 years old. Viral conjunctivitis, bacterial conjunctivitis, pterygium, episcleritis, keratitis, trauma, herpes, conjunctiva bleeding, dacryocystitis, scleritis, keratoconjunctivitis, trichiasis, and chalazion were more prevalent among the people of 39 years old.

Diagnoses of foreign bodies, viral conjunctivitis, allergic conjunctivitis, pterygium, episcleritis, corneal abrasion, keratoconjunctivitis, dacryocystitis, have been suggested to appear in spring and after winter. Keratitis trauma, conjunctive hemorrhage, blepharitis, glaucoma, trichiasis have been suggested to appear more in winter and after spring.

Herpes has been suggested to appear more in summer and winter, uveitis more often in winter and after summer, myiasis of eyes more often in spring and after summer and chalazion

more often in spring and after summer and winter.

Discussion

In this study, the patients were divided into age groups of below 15 year old, 16 to 39 years old and over 39 years old. The age group of 39 years old included the largest frequency distribution of 46.9%. 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 Shahid Rahnemoon ocular clinic during the summer and winter of 2003, the largest age group (51.5%) being the patients of 15 to 39 years old [10].

In the present study, 840 patients were under study, 525 males (62.5%) and 315 females (37.5%). In Besharati and col.' study (2003), 400 patients were under study, 59% males and 41% females. In Qasemzadeh's 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, 55.7% of the patients lived in cities and 44% lived in villages. In Qasemzadeh's study (2010), 98% of the children lived in the urban area and rest in the rural area [11].

In this study, the most prevalent cause of red eyes was conjunctivitis (30.3%) and had a significant statistical relationship with age, so it was more often met in patients of less than 16 years old with a duration of less than three weeks. 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 under 15 and no difference in red eye causes as far as seasons were concerned [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.

66% of the patients had the problem in

one eye. 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 - 23.2%, more prevalent in ages 15 to 39. In addition, red eyes with foreign bodies with an acute onset was more prevalent and most of the cases had a duration of less than a week.

The third prevalent cause was trauma, either sharp (penetrating) or blunt, with a prevalence rate of 8.6%. 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 Laroche's 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 and the manner of acute onset and the duration of less than a week. In this study, pterygium had a prevalence of 7.2% and there was a significant statistical relationship between red eyes following pterygium and age, being more prevalent in the age group over 39 years. In addition, it started gradually and its duration was more than three weeks in most cases.

Pterygium is a prevalent external ocular disease met in the entire world, which involves people in tropical and sub-tropical communities. Working outside, the exposure to ultraviolet rays and environmental factors are important in the prevalence of pterygium. In Wuk's study in China (2002), pterygium was of about 33.1% in patients with red eyes, being more prevalent in women than in men and, at the same time, the most prevalent cause of red eyes in people over 50 years old [18]. In Besharati's study, red eyes were the result of pterygium and pinguecula in the nasal part (58.3%) and, like in our study, the people over 39 years old were the largest group suffering from pterygium, being observed more in female patients (17.7%) [10].

In Panchapak's study in Australia (1998) on 3564 patients over 49 years old, 7.3% of them had pterygium, and 63.5% had pinguecula, being remarkably more prevalent in men than in women [19]. In the present study, keratitis (6%) was one of the causes of red eyes, having no significant statistical relationship with age but having a significant statistical relationship with the duration of the illness; the longest duration being over one week. Episcleritis (5.5%) was another cause of red eyes in the present study, having no

significant statistical relationship with age and manner of onset but having a relation with the disease duration, being observed between 1 to 3 weeks.

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 2.5% that had a significant statistical relationship with age and duration of symptoms and was largely observed in the age group of over 39 years, having a duration of over 3 weeks.

Blepharitis was another cause of red eyes in this study, with a prevalence of 2.1%, having a significant statistical relationship with the duration of symptoms and a prevalence of over 3 weeks. Uveitis had the prevalence of 1.9% and the blood vessel problems had a prevalence of 1.3% in the study that had a significant statistical relationship with age, being more prevalent in people over 39 years old.

In the present study, dacryocystitis had a prevalence of 2% and also a significant statistical relationship with age, being more prevalent in patients over 39 years old. There were 2 cases of congenital dacryocystitis that had a significant statistical relationship with the manner of onset and the duration of the disease so, largely, its onset was gradual and its duration was over 3 weeks. In Besharati's study, there was no case of dacryocystitis in people under 15 years old [10]. In Qasemzadeh's study, 16% of the ocular dacryocystitis were due to congenital obstruction of tear meatus [11].

In the present study, conjunctivitis diagnoses had the prevalence of 31.3%, being separated as it follows: Viral conjunctivitis (19.5%), allergic type (7%) and bacterial type (4%), in addition, there was a significant statistical relationship among viral conjunctivitis and gender and the living place. It was more prevalent in females and people living in urban regions, and all types of conjunctivitis were more prevalent in people under 15 years old, respectively viral, bacterial, and allergic types.

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 22.9% and having a significant statistical relationship with gender and age, being more prevalent in males and people between 16 and 39 years old. Pterygium with frequency distribution of 7% was the third prevalent diagnosis in our study, having a significant statistical relationship with gender and age, and being more prevalent in females and in people over 39 years old.

In this study, the diagnosis of trauma had a prevalence of 6.5% and a significant statistical relationship with the living place and being more prevalent in people living in rural places. Subconjunctivitis hemorrhage was another diagnosis of red eyes in this study, which was more prevalent in patients over 39 years old. In addition, in the present study, episcleritis had a frequency distribution of 5% and it was more prevalent in females than in males. In addition, keratitis had a frequency distribution of 3.3% and glaucoma of 2.9%. 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 2.3%. Dacryocystitis had a frequency distribution of 2.1% and it was significantly more prevalent in the rural inhabitants and also in patients over 39 years old.

Conclusion

Acute red eyes are the symptoms of a broad spectrum of benign diseases that are potentially ocular diseases, vision risks or systemic diseases [22].

The most prevalent causes of red eyes include conjunctive eye edema, foreign bodies, non-penetrating trauma and penetrating trauma, eye dryness, keratitis, iris inflammation, acute glaucoma, conjunctive hematoma, and corneal abrasion. The differential diagnoses of red eyes include painful red eyes (conjunctivitis, sclera inflammation and round sclera, keratitis and corneal abrasion, iris inflammation and intra ocular infection, acute or chronic glaucoma, traumatic conditions, sun conjunctive

hemorrhage, subconjunctival foreign bodies of cornea, corneal abrasion, cornea burns, chemical burns, penetrating and non penetrating traumas of the eyes, and other common causes (eye dryness and blepharitis). The most serious and dangerous causes happening with pain or trauma, chemical burns and penetrating strikes, must be referred to ophthalmologists immediately [2].

Patients with bacterial cornea infection, Uveitis, sclera inflammation or acute angle glaucoma need urgent reference to ophthalmologists. Also, most of the patients with red eyes, wearing contact lenses, people whose eyes are hit, people with vision changes, people with intensive pain, vomit, bad headaches, clear infectious discharge or secretion and people with cornea abnormalities or abnormalities in the anterior parts must be referred to ophthalmologists [23]. Before starting any treatment for the red eyes, an accurate, and careful differential diagnosis must be established. No topical steroid must be prescribed for doubtful keratitis. Moreover, topical anesthetic must not be prescribed at all because cornea may be poisoned [24]. It is recommended to perform some studies regarding the treatment of the patients with red eyes and to evaluate its efficiency.

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Declaration

There is no conflict of interest in this study.

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