

Research Article

Etiological Factors Contributing to Red Eye in Basrah: A Clinical Study

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Abstract

Background: Redness of the Eye (RE) results from alterations in the ocular blood vessels, specifically the dilation of conjunctival vessels, sclera or surrounding scleral structures, attributable to trauma, chemical burns, immunologic responses and inflammatory reactions. This study sought to identify the causes of RE disease in cases from Mazandaran, Northern Iran.

Methods: The 540 patients that had previously been referred to the ophthalmological in-clinics were the subjects of a descriptive research. All examples displaying RE were included in the selection criteria. The ophthalmologists at the hospital's in-clinic reviewed the patients after collecting the necessary case history information. An ophthalmoscope, fluorescein paper, a slit lamp, a Snellen chart for measuring visual acuity, flashlights for pupil evaluation and other instruments are required for the ophthalmological examination. All parts of the eye, including the lids and eyebrows, were examined during the ophthalmological examination. Changes in eye color and elevation of conjunctival vessels, as detected by slit lamp examination and observation, were the criteria for the right eye.

Results: The gender breakdown of the 540 cases examined was 325 males (62.5%) and 215 females (37.5%). Most people were 39 years old. The following conditions were found to be the causes of Res: conjunctivitis, trauma, keratitis, pterygium, episcleritis, glaucoma, blepharitis, dacryocystitis, uveitis, vascular issues, burns, UV of sun, chalazion and scleritis. For conjunctive causes, vascular problems, dacryocystitis, glaucoma, pterygium and foreign bodies, respectively, there was a statistically significant connection with patient age. In cases with reactive epitheliopathy, men living in rural regions were more likely to be diagnosed with a foreign body, whereas women residing in urban areas were more likely to be diagnosed with

viral conjunctivitis.

Conclusion: Conjunctival edema, foreign bodies, ocular dryness, iritis, keratitis, acute glaucoma, corneal abrasion, conjunctival hemorrhage and penetrating trauma are the main causes of REs. Painful Red Eye Syndrome (RED) can have many different causes, including but not limited to: conjunctivitis, inflammation of the scleral sac, keratitis, corneal abrasion, inflammation of the iris, infection within the eye, glaucoma (acute or chronic), trauma, subconjunctival hemorrhage, corneal burns, chemical burns, foreign bodies in the cornea, ocular trauma (both penetrating and non-penetrating) and other common conditions like eye dryness and blepharitis. Research evaluating the effectiveness of treating patients with REs should be undertaken.

Keywords: Red Eyes; Conjunctivitis; Keratitis; Corneal Abrasion; Dacryocystitis; Glaucoma

Introduction

Redness of the Eye (RE) results from alterations in the ocular blood vessels, specifically the dilation of conjunctival vessels, sclera or surrounding scleral areas. This phenomenon can be attributed to trauma, chemical burns, immunologic responses and inflammatory reactions, including bacterial, viral and fungal infections [1,2]. RE are generally considered benign conditions;

however, they may pose risks to vision and can potentially result in fatal outcomes [3].

The diagnosis of RE necessitates a thorough history and a comprehensive eye examination, with treatment determined by the specifics of the condition as advised by the ophthalmologist [4]. The physical examination of RE is crucial and encompasses: assessment of vision, evaluation of external eye muscle movements, measurement of intraocular pressure, examination of anterior chamber depth, detection of cells or proteins in the anterior chamber [5], assessment of light reflex and pupil shape, slit lamp examination for corneal edema and scratches, eyelid assessment and evaluation of the tear sac [3,4]. Accurate differential diagnoses of RE facilitate appropriate treatments and assist in identifying cases that require referral [6-9].

Given that RE can indicate various ocular conditions, from mild conjunctivitis to serious infections and trauma and considering the importance of ophthalmological health alongside the insufficient research in Iraq, a study was undertaken to identify the causes of RE in Basrah city.

Methodology

Descriptive research was carried out on 540 instances that were previously referred to the ophthalmological hospital-based clinics. All instances with RE were considered for selection. The ophthalmologists at the hospital's in-clinic reviewed the cases after collecting their medical histories.

Lights to check the pupils, chart snellen to measure the sharpness of vision, ophthalmoscope, fluorescein paper and a slit lamp were all necessary for the ophthalmological examination.

Eyes, eyelids and eyebrows were all part of the ophthalmological exam and changes in eye color and elevation of conjunctive vessels were RE criteria, as established by slit lamp observation and inspection.

We looked at the likely causes of REs in eight categories, including:

- Allergic, bacterial or viral conjunctivitis
- Pterygium and pinguecula changes associated with degenerative conjunctivitis.
- Keratitis, an inflammation of the cornea
- Scleritis and episcleritis, which affect the scleral tissue.
- Foreign substances, chemical burns and physical force injuries, as well as uveitis and glaucoma that affect the iris and angle
- Conditions affecting the eyelids (such as horneolum, chalazion, blepharitis and deformities)

The tear system is involved, which can lead to dacryocystitis and ocular dryness. The tonometer is the primary instrument utilized for measuring intraocular pressure. Increased intraocular pressure complicates the leveling and concavity of the cornea. The typical intraocular pressure ranges from 10 to 20 mmHg.

The data collection tools encompassed demographic information of the cases, including age, sex, occupation and residency, as well as factors related to REs, such as the precise location of RE, duration of eye redness, onset characteristics, associated symptoms, ocular clinical findings, causes of REs and comorbidities including diabetes mellitus, hypertension, dyslipidemia and thyroid disorders.

Data analysis was conducted using SPSS software (version 20) and descriptive statistical tests.

Results

A total of 540 cases were examined, with 325 (62.5%) being male and 215 (37.5%) being female. The average age of the inhabitants was 39. The subsequent factors may be regarded as the causes of REs: Conjunctivitis (30.3%), retinitis pigmentosa (23.2%), traumatic injury (8.6%), keratitis (6%), pterygium (7.2%), glaucoma (2.5%), episcleritis (5.5%), dacryocystitis (2%), blepharitis (2.1%), uveitis (1.9%), vascular issues (1.3%), burns of chemical (1.1%), ultraviolet exposure (0.9%), chalazion (0.5%), scleritis (0.3%) and other causes (5.8%), as detailed in Table 1. A statistically significant and pertinent correlation existed between patient age and pterygium, conjunctive reasons, FB, dacryocystitis, glaucoma and vascular conditions, respectively. The below enumeration comprises potential diagnosis for REs: FB (22.9%), conjunctivitis (viral (19.5%), bacterial (4%) and allergic (7%)),

trauma (6.5%), pterygium (7%), conjunctival HH (5.1%), glaucoma (2.9%), keratitis (3.3%), herpes (2.6%), corneal abrasion (2.3%), blepharitis (2.5%), uveitis (2.1%), dacryocystitis (2.1%), keratoconjunctivitis (0.7%), myiasis (0.5%), chemical burns (1.1%), trichiasis (0.5%), chalazion (0.9%) and scleritis (0.3%). The majority of foreign body detects in individuals with reactive epitheliopathy were observed in males residing in rural regions, whereas viral conjunctivitis was more frequently identified in females with urban living settings.

Reason	No.	%
Conjunctivitis	167	30.3
FB	126	23.2
Trauma	47	8.6
Keratitis	32	6
Pterygium	39	7.2
Episcleritis	30	5.5
Uveitis	11	1.9
Blepharitis	12	2.1
Dacryocystitis	11	2
Burns	6	1.1
Scleritis	2	0.3
Glaucoma	14	2.5
Chalazion	3	0.5
Vessel problems	7	1.3
Ultra violet	5	0.9
Others	31	5.8

Table 1: Etiology of RE.

Discussion

This study classified patients into two age groups: under 15 years and over 39 years. The observed age distribution corresponds with that documented by Farokhfhar, et al., who investigated the etiology and prevalence of REs in 400 patients at the Shahid Rahnmooon ocular clinic in 2016, where the predominant age group (51.5%) consisted of persons aged 15-39 years [10].

This study examined 540 cases, including 325 men (62.5%) and 215 girls (37.5%). Farokhfhar, et al., studied 400 cases, consisting of 59% men and 41% females. The research conducted by Ghasemzadeh, et al., investigated refractive defects in children at the ocular clinic of Kamkar Hospital, revealing that 60% of the subjects were male [11]. Lawan's analysis indicated a male-to-female ratio of 2:1 [12].

The primary cause of REs discovered was conjunctivitis, representing 30.3% of patients. The research conducted by Farokhfhar, et al., found the predominant causes of REs as follows: conjunctivitis at 35.8%, trauma at 22% and conjunctival degenerative alterations at 15%. Conjunctivitis was recognized as the predominant cause of REs in both genders, with the greatest prevalence in those under 15 years old, with no seasonal fluctuations in the causes of REs noted [10].

Ghasemzadeh, et al., found conjunctivitis, trauma and congenital occlusion of the tear meatus as the primary causes for clinic referrals [11]. Lawan's research identified the principal causes of REs as allergic conjunctivitis (40%), microbiological conjunctivitis (17%), corneal abrasion (11%) and inflammatory pterygium (11%) [12].

Cronau's research demonstrated that conjunctivitis was the primary cause of REs. The possible contributing factors encompassed viral, bacterial, Chlamydia or non-infectious elements such as allergies. Additional prevalent causes were blepharitis, corneal abrasion, foreign materials, subconjunctival hemorrhage, keratitis, iritis, glaucoma, chemical burns and scleral inflammation [4]. Karki's research in Nepal, which analyzed 400 instances of acute conjunctivitis, determined that viral and bacterial conjunctivitis were the predominant etiologies. Bilateral incidence was noted in 73.5% of the instances [13]. Passaro's investigation involving 200 students with REs revealed that the diagnosis was pandemic conjunctivitis [14].

Our research indicates that the second most prevalent cause of REs was the presence of foreign bodies, representing 23.2%, with a notably higher incidence among individuals aged 15 to 39. Moreover, the incidence of REs linked to foreign bodies and characterized by an acute onset was notably prevalent, with most instances persisting for less than one week.

The third most prevalent cause was trauma, whether sharp or blunt, occurring at a rate of 8.6%. According to the research conducted by Farokhfar, et al., traumatic factors were responsible for 22% of the documented instances of REs, positioning it as the second most common cause. The causes of trauma were classified into the following categories: blunt trauma (9%), chemical burns (2.8%) and foreign bodies (10.3%). The incidence of blunt trauma was found to be less than that reported in other studies [11-14], probably because most cases of penetrating trauma were directed to the emergency departments. Nirmalan's research conducted in India identified trauma as the principal factor contributing to REs [15]. Blunt trauma demonstrated a greater frequency in comparison to other types of trauma across multiple studies.

Pterygium was found to be present in around 33.1% of instances with Refractive Errors (REs), with a greater frequency in women compared to males, according to the findings of the study conducted by Wuk. Additionally, it was found as the most prevalent cause of REs in adults over 50 years of age [16]. A study that was carried out by Jabs and colleagues involved 134 instances of scleritis and episcleritis. The researchers discovered that ocular effects were present in 13.5% of cases with episcleritis and in 58.8% of patients with scleritis [17].

A substantial statistical link was found between the length of symptoms that lasted for more than three weeks and the presence of blepharitis, which was shown to account for 2.1% of REs in this research. According to the findings of the study, the prevalence of uveitis was 1.9%, while the prevalence of blood vessel disorders was 1.3%. This indicates that there is a considerable statistical association between age and the occurrence of these conditions, particularly in persons who are over the age of 39.

There were 31.3% of cases of conjunctivitis, which were classified as follows: The most common types of conjunctivitis were bacterial (affecting 4% of cases), allergic (affecting 7% of cases) and viral (19.5% of cases). In addition, the correlation between viral conjunctivitis and gender and residency was shown to be statistically significant. The prevalence was higher in females and city dwellers and among children under the age of fifteen, viral, bacterial and allergic conjunctivitis were the most prevalent kinds. Researchers Petricek and colleagues surveyed primary care physicians and ophthalmologists in nine different nations throughout Europe and the Middle East. At 35%, allergic conjunctivitis was found to be the most common diagnosis, followed by 25% for eye dryness and 24% for bacterial conjunctivitis [18].

Acute red eye syndromes are signs of many different harmless medical disorders, including ocular illnesses, vision-threatening ailments and systemic diseases [19]. Oculists should be consulted in most cases involving REs, people who wear contact lenses, those who have had eye trauma, patients who are experiencing blurred vision, extreme pain, nausea, vomiting, headaches, clear infectious secretions or discharges and abnormalities in the cornea or anterior segment [20]. Obtaining a clear and comprehensive differential diagnosis is crucial prior to initiating treatment for the REs. A topical steroid shouldn't be used when the diagnosis of keratitis is unclear. Furthermore, topical anesthetics should never be used due to the risk of corneal toxicity [21].

Conclusion

Dry eyes, keratitis, inflammation of the iris, acute glaucoma, conjunctive hematoma, corneal abrasion, non-penetrating and penetrating trauma and conjunctive eye edema are among the many possible causes of REs. Painful red eye conditions can have many different causes. These include infections of the conjunctiva, sclera, iris and intraocular space, as well as traumatic events, sunburn, sun conjunctival hemorrhage, corneal abrasion, corneal burns, chemical burns, sunburn, penetrating and non-penetrating eye traumas and blepharitis and eye dryness. Researchers should look at the efficacy of treating instances using REs and report their findings.

Conflict of Interest

The authors declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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