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Exploring the demographic and risk profile of ocular diseases in a tertiary healthcare setting in Pakistan: a gender and age-based analysis

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ABSTRACT

Background: Early diagnosis is necessary for most eye diseases to prevent blindness. Healthcare services should be tailored based on the prevalence and incidence of ophthalmic disease in that region. To investigate the prevalence of ophthalmic diseases among patients seeking treatment at a tertiary care hospital and to identify the risk factors associated with their development, with a focus on age and gender stratification.

Methods: This hospital-based cross-sectional study examined all patients who visited the outpatient department of ophthalmology at a tertiary care hospital between August and November 2022 (i.e., over a period of four months). Each participant provided voluntary verbal informed consent before being examined by an ophthalmologist and optometrist. Information about the patients was gathered using a Performa, and the data was later analyzed using MS Excel Spreadsheet and SPSS (Version 26).

Results: Two thousand ophthalmic patients (n=2000) (100%), whose ages ranged from 5 to >65 years, with a mean age of 50.44 ± 17.08 years, were studied; 940(47%) males and 1060(53%) females. The distribution of ocular diseases identified via ophthalmological examinations showed that most prevalent ocular morbidity was cataract 450 (22.5%), followed by refractive errors 430 (21.5%). Other prevalent ocular diseases included pterygium 240 (12%), bacterial conjunctivitis 220 (11%), vernal kerato-conjunctivitis 180 (9%), glaucoma 120 (6%), and eyelid diseases 110 (5.5%). Reported significant risk factors for diagnosed eye disorders among study participants included aging, vitamin A deficient diet, excessive screen time, pollution, infections, past ocular disease, family history of eye diseases, poor hygiene, seasonal allergies, trauma, diabetes, and hypertension.

Conclusion: Prevalence of ocular diseases was higher in women than in men. The most prevalent ocular morbidity was cataract.

Key-words: Ocular Diseases, Cataract, Outpatient Department, Tertiary Care Hospital, Pakistan.

Introduction

An estimated 1.4 million blind children worldwide, with a prevalence of blindness of 0.78/1000. Three quarters of these children reside in developing nations in Africa and Asia[1]. Vision is necessary for everyday activities, and any decline is severe if it is not stopped or treated promptly, as this could result in permanent vision loss and blindness; finding the prevalence and trends of eye diseases is therefore essential[2]. Early diagnosis is necessary for most eye diseases to prevent blindness.[3]

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Environmental and social variables influence a community's or region's risk for developing various eye diseases; due to these geographic and socioeconomic disparities, eye disease patterns vary significantly globally[4]. The prevalence of eye diseases is anticipated to be higher in developing countries due to the low level of health care services there, even though many eye problems are treatable with good eye care services if available. [3] By providing the proper care for these patients will significantly reduce the burden of ocular health issues. Visual loss can be avoided in patients with various eye diseases. As a necessary consequence, healthcare services are tailored based on the prevalence and incidence of infections in that region.[5] Certain age groups, racial groups, genders, and professions are more likely to contact particular ocular diseases.[5, 6] This study investigates the prevalence and frequency of various eye diseases

among patients visiting the outpatient ophthalmology unit of a tertiary care hospital in Pakistan, with a focus on age and gender stratification. The research also aims to identify the associated risk factors for these eye diseases.

Methods

This cross-sectional study was conducted to investigate the ophthalmic conditions of patients who visited the outpatient department of a tertiary care hospital in Peshawar, Pakistan. The study population consisted of 2,343,000 individuals residing in Peshawar, Pakistan, as per the 2022 census. To achieve a confidence level of 99.99% and a margin of error of 5%, a sample size of 1,514 was calculated. However, for practical reasons, data were collected from 2,200 patients, of which only 2,000 were ultimately included in the analysis due to incomplete data or lack of consent. Non-probability voluntary response, sampling technique was used, and data was collected between August 2022 and November 2022, over a period of four months. The study was approved by the Institutional Review and Ethics Board of Northwest School of Medicine (IRB number: 057 dated 15-08-2022), and all patients were informed of the study's aim and purpose provided verbal consent before enrollment.

The ophthalmologist and optometrist examined the patients to identify their ocular problems, root causes and make management decisions. Beginning with the main complaints, the history was followed by visual examinations. A Performa that contained questions regarding age, gender, exposure to pollution, past ocular disease history, ocular family history, seasonal allergic history, and clinical diagnosis was used to collect information from patients. Information gathered after visual examinations were also included in the Performa. The Snellen chart, torchlight, E chart, direct ophthalmoscope, slit lamp, indirect ophthalmoscope, trial set, retinoscope, and trail frame were used to examine the patients. The examination of the patients was thorough and comprehensive. To begin with, the ocular motility was assessed and the Hirschberg test was conducted to check the alignment of the eyes. Next, pupil reactions were carefully observed and recorded using direct, indirect, and consensual light reflex tests. To further examine the eyes, a torch, and direct ophthalmoscope was used to detect any abnormal motions or positions. The visual acuity of both eyes was also tested independently with the help of an illiterate/ literate Snellen E chart from a distance of 6 meters in a well-lit room. Pinhole testing was also performed to gauge the clarity of vision. In cases where needed, objective and subjective cycloplegic and non-cycloplegic refractions were performed. With the help of a dilated pupil, the fundus was meticulously examined using a direct and indirect ophthalmoscope.

In necessary cases, applanation tonometry and Schiotz tonometry were used to measure the pressure inside the eye. Finally, a slit lamp examination was performed, if indicated.

Diagnosis of Myopia was established for cases having a refractive error of more than -0.5 diopter. Like myopia, hyperopia was noted if the change was more remarkable than +1.0 diopter after cycloplegic refraction. The categories of myopic and hypermetropic were categorically assigned without taking (myopic, hyperopic, or mixed) astigmatism into consideration. The corneal reflex was observed when doing the cover tests to identify strabismus.

Computer data entry was performed using an MS Excel spreadsheet, and data analysis was carried out using SPSS (Version 26). Descriptive statistics, such as means with standard deviation, frequencies, and percentages, were included in the analysis of the variables. The chi-square test, with an alpha level of 0.05, was used to determine the relationship between the variables.

Results

Two thousand patients (n=2000) (100%) with ophthalmic diseases were the subject of our study, of which 47% (n=940) were men and 53% (n=1060) were women. The mean age of the participants was 50.44 $\pm$ 17.08 years. Seven-hundred and eighty (39%) patients were aged between 5-45 years old, 41.5% (n=830) were between 46-65 years old, and 19.5% (n=390) were older than sixty-five years of age. Statistics showed significant differences in the age-specific distribution of ophthalmic disorders [$\chi2$=170.025] [p=0.000]. Table *1.*

Table 1: Age-wise distribution of ophthalmic patients

Age Groups (Years)	Number Of Patients (n)	Percentage of Patients (%)	Age Based X^2 value [P-value]
5-15 years	50	2.5%	$\chi2$=170.025 [p=0.000]
16-25 years	150	7.5%	
26-35 years	140	7%	
36-45 years	440	22%	
46-55 years	280	14%	
56-65 years	550	27.5%	
>65 years	390	19.5%	
Total	**2000**	**100%**	

Gender-based distribution of ocular diseases in this study revealed statistically significant differences [$\chi2$=25.857] [p=0.018] Table *2.* Refractive error [$\chi2$=8.016] [p=0.005], pterygium [$\chi2$=4.235] [p=0.04], and glaucoma [$\chi2$=4.018] [p=0.045] showed statistical differences with maximum significance.

Table 2: Types of ophthalmic diseases prevalent in the study population, segmented by gender

Ophthalmic Diseases	Male Patients (n) (%)	Female Patients (n) (%)	Total Number of Patients (n) (%)	Gender Based X^2 value [P-value]
Refractive Errors	120 (6%)	310 (15.5%)	430 (21.5%) *[χ2= 8.016] * [p= 0.005] *	
Pterygium	160 (8%)	80 (4%)	240 (12%) *[χ2= 4.235] * [p= 0.04] *	
Glaucoma	90 (4.5%)	30 (1.5%)	120 (6%) *[χ2= 4.018] * [p= 0.045] *	
Cataract	240 (12%)	210 (10.5%)	450 (22.5%)	
Eye Lid Diseases	40 (2%)	70 (3.5%)	110 (5.5%)	
Strabismus	40 (2%)	20 (1%)	60 (3%)	χ2= 25.857 [p= 0.018]
Bacterial Conjunctivitis	100 (5%)	120 (6%)	220 (11%)	
Vernal Kerato-Conjunctivitis	50 (2.5%)	130 (6.5%)	180 (9%)	
Trachoma	30 (1.5%)	30 (1.5%)	60 (3%)	
Corneal Opacities	20 (1%)	20 (1%)	40 (2%)	
Episcleritis	10 (0.5%)	10 (0.5%)	20 (1%)	
Uveitis	20 (1%)	0 (0%)	20 (1%)	
Trauma	20 (1%)	0 (0%)	20 (1%)	
Diabetic Retinopathy	0 (0%)	30 (1.5%)	30 (1.5%)	
Total	**940 (47%)**	**1060 (53%)**	**2000 (100%)**	

** Maximumly Significant X2 values and p values.*

Four hundred and thirty cases (21.5%) of refractive error involved both male and female patients [χ2=8.016] [p=0.005]. There were 300 (15%) myopes, while 130 cases (6.5%) had hypermetropia. Table *3*.

Table 3: Gender-based distribution of the different types of refractive errors

Refractive Errors	Male Patients (n) (%)	Female Patients (n) (%)	Total number of Patients (n) (%)	X^2 Value [P Value]
Myopia	110 (5.5%)	190 (9.5%)	300 (15%)	
Hypermetropia	50 (2.5%)	80 (4%)	130 (6.5%)	χ2= 8.016 [p= 0.005]
Total	**160 (8%)**	**270 (13.5%)**	**430 (21.5%)**	

One hundred and ten (5.5%) patients had diseases of the eyelids. With a total of fifty cases (2.5%), chalazion was the most prevalent lid infection. A stye on the upper or lower eyelid was present in forty cases (2%). Blepharitis was only present in twenty cases (1%). Table *4*.

Table 4: Gender-based frequency of eyelid diseases

Eyelid Diseases	Male Patients (n) (%)	Female Patients (n) (%)	Total number of Patients (n) (%)
Chalazion	10 (0.5%)	40 (2%)	50 (2.5%)
Stye	20 (1%)	20 (1%)	40 (2%)
Blepharitis	10 (0.5%)	10 (0.5%)	20 (1%)
Total	**40 (2%)**	**70 (3.5%)**	**110 (5.5%)**

The significant risk factors that were reported by the consultant ophthalmologists among the study's participants for the diagnosed disorders were aging, unbalanced diet (i.e., a diet low in vitamin A), excessive screen time, pollution, infections, past ocular disease, ocular family history, poor hygiene, seasonal allergies, trauma, diabetes, and hypertension.

Discussion

Study findings indicated that there were more (53%) (n=1060) female patients than (47%) (n=940) male patients. Additionally, this was noted in research conducted in Pakistan[3], Ghana[7], Africa[8], and Sudan[9]. For the most part, this is because those women are more health-conscious than men, so they perform routine physicals and promptly consult doctors when experiencing any symptoms. A better community awareness regarding the significance of regular ocular check-ups and the prevention of blindness may also exist. In this study, visual issues were more prevalent in adults than children. Scott et al.[10], Khan et al.[11], Lakho et al.[9], and Ajaiyeoba et al.[12], reported an equivalent pattern. Potential factors include children's inability to communicate their issues effectively, which may cause them to delay seeking medical attention until symptoms are severe enough to make the cut as ocular morbidity.

Cataract was the most prevalent diagnosis, with 10.5% women and 12% men among them. Cataract was also the leading cause of ocular morbidity in studies conducted in Pakistan[3], Nigeria[13], and Sudan[9]. The dry, bright sunshine and grimy weather may be responsible for the high prevalence of cataracts in the population under consideration. Refractive errors left uncorrected are a significant global issue for eye health. It has socioeconomic and educational repercussions, and it influences quality of life.[14] Refractive Error was the second most frequent cause of ocular morbidity in the current study. Myopia, which was more prevalent, while 6 % had hypermetropia. Rashwan et al.[15] also identified refractive error as the second most pervasive ophthalmic disease in their study. Similarly, a study by Riaz et al.[16] revealed that 49.76% of all patients had refractive errors; patients with (19.10%) myopia were more prevalent than those with (5.44%) hypermetropia. The current sample's higher prevalence of refractive errors could be attributed to excessive screen use. Viral and bacterial conjunctivitis combined affected 20 percent of the 2000 patients in the current study. Contrarily, 7.12% of participants in a study conducted in Iran had

conjunctivitis[17]. Nevertheless, the study by Kang et al.[8] in Africa found that conjunctivitis was the most prevalent cause of eye disease. Increased cases of conjunctivitis in the study under consideration may be caused by unhygienic practices, dusty environments, and pollution. Pterygium was present in our research in 12 % of cases, with 4% of female patients and 8% of male cases. In contrast, 2.6% of subjects in a study by Hussain et al.[18] had pterygium, with 0.77% of men and 1.8% of women. This study revealed that the prevalence of Glaucoma was 6% out of the total 2000 patients. Compared to a survey conducted in Peshawar, the prevalence of Glaucoma was 4.5%.[19]

Conclusion

Ocular diseases are more prevalent in older age groups. In comparison to men, women were more impacted. Cataract was the most prevalent eye disease. The second most frequent contributor to ophthalmic disorder was refractive errors.

Conflicts of Interest: None declared.

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