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Ocular morbidity pattern in Kashmir – A hospital-based study

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ABSTRACT

Background: In recent years, some epidemiological surveys of common eye diseases and prevalence and risk factors for blindness and low vision have been carried out in various parts of India. Still, very little information is available on the prevalence of ocular diseases in Jammu Kashmir, particularly those who live in the remote areas of Kashmir.

Methodology: A total of 234 patients attended the eye OPD, which constituted the study's sample size. The patient was screened, keeping COVID-19 guidelines in mind. Sanitization and social distancing were maintained. Visual acuity was evaluated using Snellen's chart for the literates and illiterate E chart for the illiterates from 6m. Both Objective and subjective refraction was performed on a patient to determine refractive error. Anterior segment was examined with torchlight and magnifying loupe & slit lamp if and where necessary. The fundus was examined on a slit lamp using the +90D or with Direct Ophthalmoscope. Refractive error was quantified in terms of spherical equivalent. The visual acuity of a patient was converted into LOG MAR for statistical calculation.

Result: A total of n=234 patients were examined for evaluation of ocular morbidity, of which 97(41.45%) were male %, and 137(58.55%) were female with a male to female ratio of 7: 10. The mean age of the patients was 36.96 ± 23.93 years.56.8% were diagnosed with refractive error and 30.8% with cataracts. There was a statistically significant relationship between increasing age and cataracts.

Conclusion: As Refractive error and cataracts were the emerging ocular morbidity, the population is living in the remote areas of Kashmir, especially children, should get quality eye care.

1. Introduction

Ocular morbidity tells us about the frequency with which a particular eye disease occurs in a particular region/community. The causes of ocular morbidity vary across the country as they have different environmental variables, socioeconomic, geographic, and ethnic backgrounds. In recent years, some epidemiological surveys of common eye diseases and prevalence and risk factors for blindness and low vision have been carried

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out in various parts of India.[1,2] Increased emphasis has been put on preventing and treating blindness and low vision worldwide. Still, very little information is available on the prevalence of ocular diseases in Jammu Kashmir, particularly those who live in the remote areas of Kashmir. The average elevation of the Kashmir valley is 5,300 feet above sea level. The tall mountains surrounding the valley rising to 16,000 feet ensure that the weather here is pleasant for most of the year.[3] The average temperature of Kashmir is 21.3 °C | 70.4 °F; July is the hottest month of the year. At 0.3 °C | 32.5 °F on average, January is the coldest month of the year. People living there spend most of their time indoor to protect themselves from the harmful health effects of cold. For countries with temperate or colder climates, 18 °C has been proposed as a safe and well-balanced indoor temperature to protect the health of general populations during cold seasons.[4] Considering the complicated epidemiology of visual impairment and the wide variety of factors involved, specific intervention strategies are required for every community living in various parts of India. Due to the absence of appropriate community-based data in and around Kashmir, the current research aims to evaluate the pattern of ocular morbidity in the Kashmiri regions. In future, specific interventions programs should be implemented to minimize the burden of eye disease.

2. Materials and Methods

All patients who attended the hospital from Jan 2021 to July 2021 were enlisted for this study. The patient data were collected from the prescription paper and were analyzed retrospectively. A total of 234 patients attended the eye OPD, which constituted the sample size of the study. A personal observation form was used to collect the data, which comprised detailed history and evaluation of the patients. The patient was screened, keeping COVID-19 guidelines in mind. Sanitization and social distancing were maintained. Visual acuity was evaluated using Snellen's chart for the literates and illiterate e-chart for the illiterates from 6m. Both objective and subjective refraction was performed on a patient to determine refractive error. Objective refraction was performed with retinoscopy and auto-refractometer. Dilated retinoscopy was performed on children so that the exact amount of refractive error could be estimated. Anterior segment was examined with torchlight and magnifying loupe & slit lamp if and where necessary. The fundus was examined on a slit lamp using the +90D or with direct ophthalmoscope. A fundus evaluation under mydriasis was done in relevant cases. For visual field estimation, a Humphrey visual field analyzer was used. The slit-lamp is the major instrument for the collection of data in the study. All the data was obtained through the study; statistical analysis was done using statistical analysis was performed with statistical package for the social sciences (SPSS) version 12.

2.1. Ethical statement

All participants are guaranteed anonymity and confidentiality of the information obtained. The approval took before the study from the patients participating in the study. Informed consent was accepted by all the participants included in the study. Subjects were informed about the duration and procedures of the study. the research was approved by the department

2.2. Definitions and analysis

Ocular morbidity was defined as an abnormality in any ocular structures that may or may not be visually significant. Refractive error was quantified in terms of spherical equivalent. The spherical equivalent of refractive error was obtained by adding half of the cylinder value to the spherical value of the eye's refractive error. The visual acuity of a patient was converted into LOG MAR for statistical calculation. CFFC (finger counting close to face) was replaced by a decimal acuity of 0.0025 and HM to 0.002, & 0.0016 for "light perception" (LP), and 0.0013 for NLP.[5] Myopia was defined as a spherical equivalent of −0.50 DS (diopter sphere) or greater in one or both eyes. Hyperopia was defined as a spherical equivalent of +0.50DS or more in one or both eyes. A cylindrical power of −0.50 DC (D cylinder) or greater was considered astigmatism.

2.3. Distance visual impairment was graded according to WHO as follows

Mild	Visual acuity worse than 6/12 to 6/18
Moderate	Visual acuity worse than 6/18 to 6/60
Severe	Visual acuity worse than 6/60 to 3/60
Blindness	Visual acuity worse than 3/60

2.4. Near Visual impairment was defined as

Near Visual Acuity worse than N6 or M.08 at their working distance
Glaucoma was diagnosed with either two features; high intraocular pressure > 21mmhg, significant disc changes (cup: disc > 0.6), or visual field defect. Other ocular diseases such as cataracts, conjunctivitis, pterygium, optic atrophy, etc., were diagnosed on clinical examination.

Statistical analysis was performed with statistical package for the social sciences (SPSS) version 12. P-value and confidence intervals were also used to indicate the level of significance of the findings. The study adhered to the tenets of the Declaration of Helsinki and was conducted after obtaining ethical approval from the respective hospital.

3. Results

The data mentioned in this study is acquired by the optometry inters doing their internship from the two government hospitals located in Kashmir during the ongoing covid pandemic from Jan 2021 to July 2021. A total of n= 234 patients were examined for evaluation of ocular morbidity, of which 97(41.45%) were male %, and 137(58.55%) were female with a male to female ratio of 7: 10. The mean age of the patients was 36.96 ± 23.93 years, with a minimum age of 3 years and a maximum of 80 years. The patients were divided into different age groups. The distribution of the patients in the different age groups based on their gender is shown in the given (Table 1).

The distribution of presenting visual acuity is shown in (Table 2). There was a statistically significant relationship between age and presenting visual category with P = 0.032. Only RE visual acuity was considered (Spearman correlation coefficient; r =0.458, P<0.01). Except for one male patient with corneal dystrophy, presenting visual acuity without a glass of all the patients (n=233) was checked. 32.3% of males & 48.2% of females fall into normal vision, presenting visual acuity between 6/6 - 6/12. Rest 67.7% of males and 51.8% of females were visually impaired based on their presenting visual acuity. 13.5% of males (n=96) & 10.9% of females (n=137) fall into the blindness visual category having to present visual acuity of less than 3/60.

As the Spearman correlation coefficient for SE in the left and right eye was high (r=0.80, P < 0.001), only right eye data was used to analyze the refractive error. 56.8% (n=131) of the patients from 3-80 years were diagnosed as refractive error in which 64.9% (n=85) had astigmatism (95% CI 56.8 – 73.5), 23.5% (n=31) had hyperopia (95% CI 16.7-20.3) and 11.4% (n=15) had myopia (95% CI 6.1 – 17.4). (Table 3) Astigmatism was found higher in the 11-20 age group (50.6%), gradually decreasing from 16.5% in the 21-30 age group to 4.7% in the 41-50 age group. The amount of astigmatism was significant, with age having p<0.01. Hypermetropia was also significantly associated with age with p <0.01. There was a gradual decrease in hyperopic patients from 41.8% less than 10 years old to 22.6% in the 11-20 age group and then to 6.4% in the 31-40 age group.

30.8% (n=72) patients were diagnosed with cataracts in one or both eyes, out of which 35% were males, and 27.8% were females. (Table 5) There was a significant relationship between increasing age and cataract with P=0.000. 17.8% of cataracts are in the 41-50 age group, which increases to 30.1% in the 51-60 age group and then to 49.3% above 60 years of age. The distribution of cataracts which started from 31-40 age group according to gender, is shown in (Table 4). 5 patients were diagnosed with glaucoma, of which 2 were males & 3 were females. 3.14% & 1.3% (n=131) were diagnosed with conjunctivitis & conjunctiva hemorrhage respectively. Other diseases include one case each of episcleritis, sentinel vessels, hypertensive Retinopathy, Keratitis, molluscum contagiosum, diffused congestion, entropion, chronic Dacryocystitis, atrophic bulbi, pinguecula & corneal dystrophy.

4. Discussion

The sample size of this study was 234 patients. Because of the ongoing pandemic restrictions, a little number of patients walks in. In our study, blindness was seen in 12.0% (28) and visual impairment in 58.36% (136) of the patients, higher than studies conducted in a different region of India. In a study conducted in northern India, blindness was seen in 8.0% (36) and visual impairment in 30% (135).[2] Similar results were shown in a study done by Pisudde PM et al.[1] This increase in the prevalence of blindness is due to the low availability of eye care providers in the area. People tend to travel long distances to reach district/sub-district hospitals. For the services that cannot be done, the patients get referred to the main hospital in Srinagar. Also, being the region of conflict, there are many restrictions for the people living in those areas to get access to eye care. Not getting access to eye care is one of the main causes of visual impairment in the world. In the year 1970, a study revealed that there was a high prevalence of refractive error (40.8%) and cataract (40.4%) among the elderly population (age>50yrs) in the rural area of central India.[6] This trend is still maintained till today, as studies conducted have shown the same.[6,7] One of the studies reported that astigmatism, hyperopia, and myopia were the most common refractive errors in children and adults in the mentioned order.[8] A similar result was obtained in this study. Most of the myopic patients diagnosed belong to the 11-20 age group, which is similar to the study done by Dandona in which myopia was significantly more frequent in subjects 10 to 15 years of age.[9] Kallklvayl V et al. reported that the prevalence of myopia was found to be significantly higher among children aged ≥ 10 years compared to those < 10 years (p <0.001).[10] Increase prevalence of myopia with 3.76% in the age group of 6–10, 4.9% and 6.16% in age groups of 11–15 and 16–22 had been reported in one of the studies done in Kashmir.[11] Studies conducted in different parts of the world reveal that the amount of astigmatism increases with age.[9,12,13] Still, in our study, astigmatism was reported higher in the 11-20 age group (50.6%), which gradually decreased. The results of myopia and astigmatism in children and adults are interesting. The relationship between near work and myopia has been shown in different. studies.[14,15] Some studies have reported that near work causes astigmatism due to cyclotorsion.[16,17] Therefore, excessive near work and use of phones/laptops in this age group may have caused astigmatism in those children due to cyclotorsion, manifesting astigmatism and myopia in adulthood. However, the role of ethnic, genetic, and environmental factors should be considered, as well.In

Table 1: Distribution of study population by age and sex

Age Group	Male n (%)	Female n (%)	Total n (%)
<10	17(17.52)	16(11.76)	33
11-20	24(24.74)	37(27.20)	61
21-30	4(4.12)	14(10.29)	18
31-40	3(3.09)	7(5.14)	10
41-50	9(9.27)	19(13.9)	28
51-60	13(13.4)	25(18.38)	38
> 61	27(27.83)	19(13.97)	46

Table 2: Comparison of visual acuity in different age groups.

Sex	Age Group	Visual Category					
		Normal 6/6 - 6/12	Mild 6/12-6/18	Moderate 6/18-6/60	Severe 6/60-3/60	Blindness less than3/60	Non-Cooperating
Male	<10	3	1	3	1	0	9
	11-20	10	3	7	2	1	1
	21-30	3	0	1	0	1	0
	31-40	2	0	0	0	0	0
	41-50	6	0	2	0	0	0
	51-60	3	0	3	1	4	0
	> 61	4	2	7	9	7	0
	Total	31(32.3%)	6(6.2%)	23(24%)	13(13.5%)	13(13.5%)	10(10.4%)
Female	<10	9	0	5	**1**	0	1
	11-20	21	1	11	3	0	0
	21-30	11	0	1	2	0	0
	31-40	4	1	1	1	0	0
	41-50	8	4	1	1	5	0
	51-60	7	4	7	3	6	0
	> 61	6	2	3	3	4	0
	Total	66(48.2%)	12(8.8%)	29(21.2%)	14(10.2%)	15(10.9%)	1(0.7%)

Table 3: Various ocular morbidity reported based on gender

Ocular Morbidity	Male n(%)	Female n(%)	Total n(%)
Refractive Error	48(49%)	83(61.02%)	131(56%)
Cataract	34(35%)	38(27.8%)	72(30.8%)
Glaucoma	2(2.04%)	3(2.2%)	5(2.14%)
Conjunctivitis	4(4.1%)	4(2.9%)	8(3.41%)
Hypertensive Retinopathy	1(1.02%)	0	1(0.42%)
Keratitis	1(1.02%)	1(0.73%)	2(0.85%)
Conjunctival Hemorrhage	1(1.02%)	2(1.5%)	3(1.3%)
Pterygium	0	1(0.73%)	1(0.42%)
Epi Scleritis	0	1(0.73%)	1(0.42%)
Hordeolum Internum	1(1.02%)	0	1(0.42%)
Corneal Ulcer	1(1.02%)	0	1(0.42%)
Sentinel vessels	0	1(0.73%)	1(0.42%)
Molluscum Contagiosum	1(1.02%)	0	1(0.42%)
Diffused Congestion	1(1.02%)	0	1(0.42%)
Entropion	0	1(0.73%)	1(0.42%)
Chronic Dacryocystitis	0	1(0.73%)	1(0.42%)
Atrophic Bulbi	1(1.02%)	0	1(0.42%)
Pinguecula	0	1(0.73%)	1(0.42%)
Corneal Dystrophy	1(1.02%)	0	1(0.42%)

Table 4: Distribution of refractive error in different age groups

	Age Groups(years)								
Types of Refractive Error	**<10**	**11- 20**	**21- 30**	**31- 40**	**41- 50**	**51- 60**	**above 60**	**Total(n=131)**	**P value**
Myopia n,(%)	1(6.6%)	10(66.6%)	3(0.2%)			1(6.6%)		15(11.4%)	P<0.01
Hyperopic n,(%)	13(41.8)	7(22.6%)	1(0.6%)	2(6.4%)	4(13%)	3(9.6%)	1(3.2%)	31(23.5%)	P < 0.01
Astigmatism n,(%)	15(17.64%)	43(50.6%)	14(16.5%)	2(2.3%)	4(4.7%)	4(4.7%)	3(3.52%)	85(64.9%)	P<0.01

Table 5: Distribution of cataracts in age groups based on gender

	Gender, n (%)		
	Male	**Female**	**total**
31 - 40	1(2.85%)	1(2.63%)	2(2.73%)
41- 50	4(11.42%)	9(23.68%)	13(17.8%)
51- 60	8(22.85%)	14(36.84%)	22(30.1%)
above 60	22(61.76%)	14(36.84%)	36(49.3%)
Total	34	38	72

this study, 23.5% (n=31) of the population was found to have Hypermetropia of > + 0.50 DS in which the majority of hyperopic patients were in the <10 & 11-20 age group with a cumulative percentage of 64.4% (n=20). The prevalence of hyperopia in children has varied in different studies in different populations, depending on the criteria used. It has been reported 1.8% (greater than +2 D) in South Africa,[18] 2.96% (at SERE greater than +3.5D) in Malaysia[19] but less than15.6% (at SERE greater than +4 D) in an Indian study[20] and 16.5% (at SERE greater than +0.5 D) in an Iranian study.[21] In this region of Kashmir where this study took place, cataract accounts for 30.8% of ocular morbidity. Advancing age was a leading risk factor for the development of cataracts. It is also evident from other studies that the prevalence of cataracts increases with age[6,22,23] glaucoma is the second leading cause of blindness worldwide and is of significant public health problem. Although it is the leading cause of irreversible blindness worldwide in our study, glaucoma accounted for 2.14% visual impairment in our study. A similar result was seen in the Botucatu eye study, where glaucoma accounted for 2.2% of visual impairment.[24] One of the studies conducted in 2010 estimated that there are approximately 11.2 million persons aged 40 years and older with glaucoma in India.[25] Most people don't even know that they have this disease until detected later in life. Screening & treating those people for glaucoma is still a challenge in India.

5. Conclusion

As Refractive error and cataracts were the emerging ocular morbidity, the population living in the remote areas of Kashmir, especially children, should get quality eye care. Mobile eye units should be arranged wherever providing eye care is a challenge.

6. Recommendation and Limitation

In this study, the ocular morbidities were more only in two conditions: refractive error and cataract, other morbidities were associated with other ocular conditions, but the ratio was not significant. This study was conducted during the Second Phase of the COVID-19 pandemic. So, there is a need to do further study on a large scale in large duration. There is a need to do school screening programs and awareness programs on a large scale to make people aware of Kashmir to avoid curable and treatable ocular morbidities.

7. Ethical Approval

The study got its approval from the Department of Paramedical Sciences Jamia Hamdard New Delhi

8. Source of Funding

This research did not receive any outside funding or support.

9. Conflict of interest

None.

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