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OCULAR MORBIDITY IN RURAL POPULATION OF NARAINGARH, AMBALA, INDIA.

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Abstract: *It has been hypothesized that the prevalence of eye disorders increases indifferent age groups in a rural population in India. Therefore, middle-income countries should prioritize providing health preventive and rehabilitation programmes. The study aimed to determine the pattern of ocular eye disorder in patients attending the outpatient eye department of a rural eye hospital in Naraingarh, Ambala, India. It is Hospital-based descriptive cross-sectional study. This study incorporated all the patients reported in secondary eye care hospitals and initially written consent forms taken formally the participants, followed by demographic information and detailed case history. A detailed ocular examination was done for all the participants to determine any ocular morbidity. All the data were entered in a Microsoft Excel 2020andanalyzedusing IBM Statistical Package for Social Sciences (SPSS) version 20. Descriptive statistics such as frequency and percentage were calculated. Out of a total of 3321subjects,1562(47.01%) were male, and1759(52.9%) were females. The most common ocular morbidity was cataract (19.59%), followed by Presbyopia (15.32%), Refractive error (13.51%), allergic conjunctivitis (12.13%), and dry eye (5.29%). The percentage of low-vision patients was 8.98%. Refractive error was the most common ocular morbidity in the 4-17 age group, followed by allergic conjunctivitis and dry eye. Prevention and treatment of ocular disease can be made easy by regular screening of the eye, simple, safe, easy, and cost-effective tools of few surgical procedures. Education about health should be imparted to the community regarding healthy eye care practices.*

Introduction

Eye diseases have become a significant public health concern, yet eye care still tends to have a low priority rating in most developing countries in general health care.1Ocular morbidity is considered one of the most under-diagnosed and untreatable public health issues in many developing countries, especially in Asia.2–4 According to WHO, 285 million people worldwide have a visual impairment, of which 39 million are blind and another 246 million have low vision.5,6 As per the National Program for Control of Blindness (NPCB), the prevalence of avoidable blindness in India was 1.1% in 2001-2002, which was reduced to 1% in 2006-2007.7 Vision2020:theRighttoSight is a global initiative to eliminate avoidable blindness, prioritizing blinding eye diseases like cataracts, glaucoma, trachoma, and retinaldisease,90%ofwhichoccurinlow-incomecountries.

Other eye conditions, which may affect an individual's quality of life and cause people to seek care but do not necessarily lead to blindness, have been overlooked. As a consequence, the epidemiology and impact of many non-blinding ocular diseases (e.g. allergic and infective conjunctivitis, dry eye syndrome, mild refractive error, and presbyopia) has not been sufficiently taken care of, especially in developing countries, where the availability of evidence is limited by the lack of population-based studies, unreliable hospital activity data, and extensive use of informal care providers.8 The spectrum of eye defects can be termed "ocular morbidity." Ocular morbidity describes eye diseases that are either significant to the individual or to professionals (an eye health professional determines that the solitary would benefit from advice, further review, or treatment). There is limited information about the prevalence, incidence, and pattern of ocular morbidity in populations in developing

countries. The only few studies that have been conducted that suggest the majority of eye diseases do not cause visual loss may be a significant hindrance to the population and health system.

Various reports have suggested the fact that 80% of the global burden of visual impairment can be prevented, treated, or cured. Globally, the leading causes of blindness are cataracts, uncorrected refractive errors, glaucoma, and age-related macular degeneration. Other major causes include corneal opacities, diabetic retinopathy, and trachoma9 even in our country, preventable and treatable causes like cataract (62.6%) and refractive error (19.70%) still contribute to more than 80% of preventable blindness. Factors which strongly influence the occurrence, burden, and pattern of ocular diseases in a particular community include the age structure of the population, socioeconomic condition, educational status, occupational profile, environmental condition, etc.

In recent years, there has been a dramatic increase in the geriatric population worldwide and more old people are wants to alive now a days. According to a survey done in 2001, there were 71 million elderly persons above 60 years of age in India. This number is expected to increase to 179 million by 2031.10

The lack of knowledge about the prevalence and distribution of various ocular diseases within populations has implications for planning and delivery of eye care services, particularly at the primary care level, where many of these conditions could be effectively managed. However, primary care services in low-income countries are often insufficiently developed to manage eye diseases. As a result, many individuals with eye complaints, regardless of severity, seek care at more expensive secondary-level facilities or do not seek care at all, missing opportunities for early treatment. For example, a study in rural India found that over 58% sought treatment from a general hospital rather than a locally based provider, while two thirds of people with severe visual impairment (e.g., cataracts, glaucoma) did not access any healthcare.11

The ocular morbidity varies with different region.12 With the help of this study we are able to know about the pattern of ocular morbidities in rural population across the different age groups. It will help to focus in rural area to prevent the different types of ocular morbidities may be due to lack of awareness, lack of facility available in rural area.13

Considering the complicated epidemiology of visual impairment14, region specific intervention strategies are required for every community. Therefore, comprehensive studies of the changing trends ocular problems are required to reduce the load of ocular morbidity.15 Hence, the present study attempts to determine the Pattern of common ocular morbidityin a rural community of Naraingarh across different age group. The main of the study was to determine the prevalence of the ocular morbidity across different age group in rural population of Naraingarh, Ambala, India.

Subjects and Methods:

The committee's Ethical Board approved the study. A hospital-based descriptive cross-sectional study was done in the outpatient eye department of a rural eye hospital (Sanjivni Health Care) in Naraingarh Ambala district, India. The eye hospital serves a population of about 1.5 million residing in 182 villagesand4Tahsil.ThestudyoccurredfromMarch1st,2020, to the end of May 31st 2021. All consecutive patients with ocular problems seen in the eye outpatient department for the first time were included in the study. The data collection for the study was conducted for a period of one year, with all patients attending an eye clinic at a rural eye hospital from August 1st, 2020, to July 31st, 2021. The Participants were selected by serial recruitment of all patients, that is, through (Random Sampling method) attending the eye clinic after their written informed consent.

The subject included ages between 4 to 95 years and who were willing to participate in the study. Mental developmentally disabled patients aged below four and above 95 years were excluded from the study.

Study design and protocol

Informed written consent was taken after explaining the purpose of the study to the subjects. Demographic data and detailed history were taken involving all the ocular and systemic aspects of the subject. Visual acuity was tested with the help ofSnellens'Echart'atadistanceof6meters; for illiterate patients, a "C chart" was used. Objective and subjective refraction was performed; children up to 15 years undergo cycloplegic refraction. Anterior segment examination, including lids, lacrimal sac, conjunctiva, cornea, anterior chamber, pupil, iris and lens, was done with the help of a slit lamp (under diffuse light illumination). Posterior segment examination was performed with the help of a +90 D lens. Intraocular pressure was checked with Goldman Applanation Tonometer (GAT). Colour vision was tested with the help of 38 plates Ishihara chart. If the patient had a retinal problem, the examiner sent him/her to the tertiary eye care centre for further management. Strabismus assessment was done using an occluder (cover uncover test) and the Hirschberg test. Schirmer's strip was used for the assessment of dry eye. The ocular disorder was divided on its anatomical basis as disorders affecting the conjunctiva, cornea, lens, uvea, retina, optic nerve, ocular muscles, nasolacrimal duct system, lids, orbit and refractive system. We only report the primary diagnosis of each patient. The patient's primary diagnosis in the study represents the diagnosis, condition, problem, or other reason for the encounter/visitants chiefly responsible for the outpatient services provided.

Results:

All the data were entered in a Microsoft excel 2020 and analyzed using IBM Statistical Package for Social Sciences (SPSS) version 20. Descriptive statistics such as frequency and percentage were calculated. Paragraph statistics methods were applied for this study.

A total of 3321 subjects were enrolled for the study during that period. The subjects included were 1562 (47.01%) Males and 1759 (52.9%) Females (Table 1).

Gender	Number of cases	Percentage
Male	1562	47.01%
Female	1759	52.9%
Total	3321.	

Table1 – Gender distribution of total population.

Out of which 443 (13.34%) were children, 1730 (52.07%) were Adults, and 1148 (34.56%) were Elderly (Table 2) patients took part in the study.

Age group	
4-17 years	Children group
18-50years	Adult group
51- 95	Elderly group

Table 2 – Age group distribution.

The mean age of all the patients was 42.12 ± 19.46 years and ranged from 4 years to 95 years.

	No. of cases (n)	**Percentage**
Children	443	13.34%
Adult	1730	52.07%
Elderly	1148	34.56%
Total	3321	

Table3-Differentagegrouppopulationdistribution.

The most common ocular morbidity seen across overall population (Figure1) was Cataract seen in 651(19.59%) subject followed by Presbyopiain509 (15.32%), Refractiveerror449 (13.51%), Allergic conjunctivitis403(12.13%), Dryeye176 (5.29%), Pseudophakia165(4.96%), Cornealforeignbody98 (2.95%), Subconjunctival haemorrhage84(2.52%), Pterigium 72(2.16%), Cornealscar60(1.80%), Cornealulcer59(1.77%), Viralconjunctivitis56(1.68%), Corneal abrasion52(1.56%), Stye37(1.11%), Glaucoma30(0.90%), Diabetic Retinopathy seenin29(0.87%), Other retinal problemin27(0.81%), Episcleritisin25(0.75%), keratitisin21(0.73%), Conjunctival foreignbodyseenin20(0.60%), Blephritisin15(0.48%), Iritis in 14 (0.42%), Chalazion and Optic atrophy seen in 12 (0.36%) eachsubject,AmblyopiaandAphakiaseenin8(0.24%)subject, Chemical injury in 7(0.21%), Lid mass and Ptosis in 6(0.18%), Squint seen in 5 (0.15%), Meoibomion Gland Dysfunction(MGD), Age Related Macular Degeneration (ARMD), Central Serous Retinopathy (CSR), Retinal Detachment(RD), Convergence anomaly, Nystagmus, Ocular trauma seen in 4 (0.12%) subject each, Scleritis and Corneal edema seen in 3 (0.09%), Lid tear, Iris coloboma, vitreous haemorrhage seen in 2 (0.06%) each, 6th nerve palsy, Congenital Nasolacrimal Duct Obstruction(CNLDO),Dislocated lens, keratoconous seen in 1 (0.03%) each.

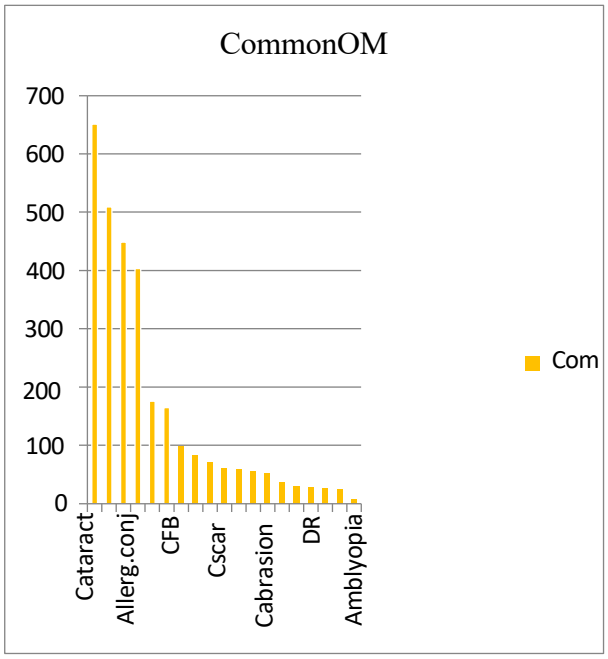

Figure 1 - Ocular morbidity in overall population. Source: Original

The most common ocular morbidity in the Children group (Figure2) was Refractive error which was seen in 127(28.66%), followed by Allergic conjunctivitis in 120 (27.09%), Retinal problemwasfoundin68(15.33%), Dryeyein36(8.13%), Glaucomain30(6.77%), Subconjunctivalhaemorrhagein14 (3.16%), opticatrophyin12(2.70%), acornealscarin11 (2.48%), Blephritis in 10 (2.25%), Amblyopia in 8 (1.80%), Corneal abrasion and corneal foreign body seen in 6 (1.35%) subject each, Chalazion in 5 (1.13%), Conjunctival foreign body, cataract, Convergence anomaly, Nystagmus, Ocular trauma, Squint seen in 4 (0.90%) each, Ptosis, Corneal oedema, Corneal ulcer, Pseudophakia, Scleritis in 3 (0.68%), Lid mass, Episcleritis, iris coloboma, Vitreous hemorrhage seen in each 2 (0.45%) while sixth nerve palsy, Congenital nasolacrimal duct obstruction, Iritis seen in 1 (0.23%) subject each.

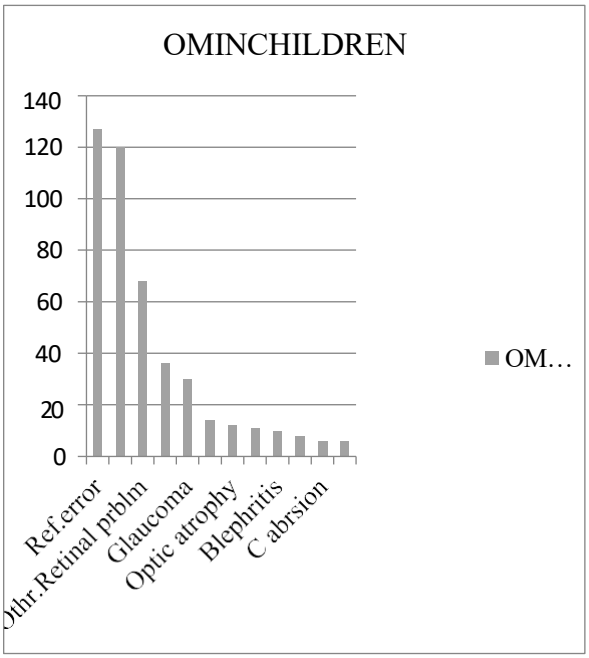

Figure2-Ocularmorbidityinchildrenage group.

The most common ocular morbidity in Adult group (Figure 3) was Presbyopia which was seen in 390 (22.54%) followed by Refractiveerrorin254(14.68%), Allergicconjunctivitisin242 (13.98%), Dry eye in 134 (7.74%), Cataract in 115 (6.64%), Corneal foreign body in 87 (5.02%), Sub conjunctival hemorrhage in 60 (3.46%), Viral conjunctivitis in 48 (2.77%), Corneal aberasion and corneal ulcer in 38 (2.19%), Pterigiumin 31 (1.79%), Corneal scar in 26 (1.50%), Episcleritis and Stye in 19 (1.09%) each, Conjunctival foreign body and retinal problem in16(0.92%),keratitisin13(0.75%), Diabetic retinopathy in 12 (0.69%), Pseudophakia in 11 (0.63%), Iritis in 9 (0.52%), Chalazion and chemical injury seen in 7(0.40%), Blephritis, Central Serous Retinopathy, Amblyopia, Convergence anomaly seen in 4(0.23%), Lid mass and scleritis seen in 3(0.17%), Ocular trauma, Aphakia, Lid tear in 2(0.11%) subject while Meiobomian Gland Dysfunction, Corneal edema, keratoconous, dislocated lens, iris coloboma, Retinal Detachment, 6th Nerve palsy and Squint seen in each 1(0.05%).

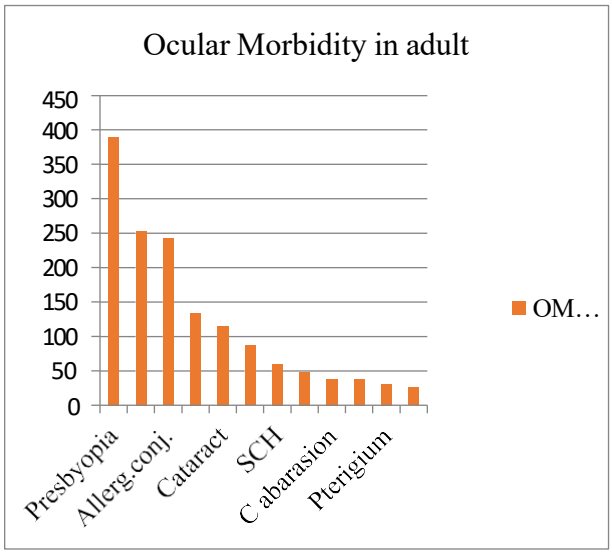

Figure3– Ocular morbidity in adult age group.

Cataract was the most common leading cause of ocular morbidity in the Elderly age group population (Figure 4), which was seen in 532 (46.34%) subject, followed by Pseudophakia in 151(13.15%), Presbyopia in 119(10.36%), Refractive error in 68(5.92%), Allergic conjunctivitis and Pterigium seen in each 41(3.57%) subject, Glaucoma in 30(2.61%), Corneal scar in 23(2%), Corneal ulcer in 18(1.56%), Diabetic Retinopathy in 17(1.48%),Opticatrophyin12(1.04%), Other retinal problem in 11(0.95%), Sub conjunctival hemorrhage in 10(0.87%),keratitis in 9(0.78%), Corneal abrasion in 8(0.69%), Stye, Dry eye and Aphakia seen in each 6(0.52%) subject, Corneal foreign body in 5(0.43%), Episcleritis, Iritis, ARMD in 4(0.34%), RD, viral conjunctivitis, MGD in 3(0.26%), Corneal oedema seen in 2(0.17%) while Blephritis, lid mass, Ptosis and ocular trauma seen in 1(0.08%) each subject.

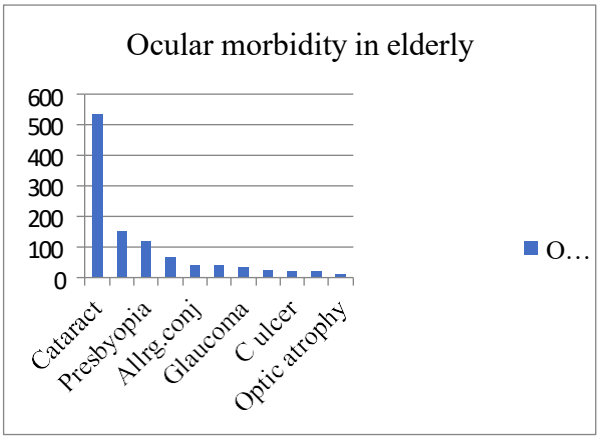

Figure 4- Ocular morbidity in elderly age group. Source: Original

The highest occupation found in the overall population is Housewife (n=1158), followed by Student (n=657), Farmer (n=583),Teacher(n=250),Shopkeeper(n=183),Driver(n=114), Retired employee (n=91), Banker (n=68), Aanganwadi worker (n=34), Electrician (n=30), Clerk (n=28), Police (n=22), Goldsmith (n=17), Tailor (n=14),Nurse(n=12),Lawyer (n=10), Carpenter (n=9), Engineer (n=8), Doctor and Manager (n=5), Cobbler and Maid (n=3), Architect, Businessman, Chef, Dietician, Technician, Peon (n=2), Government employee, Private job, Labour, Dentist and Barber (n=1).

Best corrected visual acuity (BCVA) was (Table 4) found 6/6 in 2396(72.12%),6/9in387(11.64%),6/12in239(7.19%),6/18 in70(2.10%),6/24in54(1.62%),6/36in25(0.75%),6/60in 136(4.09%)andlessthan6/60wasfoundin 14 (0.42%).

SnellensVA	Number of subject (n)	Percentage(%)
6/6	2396	72.12
6/9	387	11.64
6/12	239	7.19
6/18	70	2.10
6/24	54	1.62
6/36	25	0.75
6/60	136	4.09
<6/60	14	0.42

Table4-DistributionofVisualAcuityacrossParticipants.

Discussion:

In the present study, the prevalence of ocular morbidity sociodemographic factors and other individual factors associated with ocular morbidity were more or less similar to other studies. Cataract was the leading cause (19.59%) of visual impairment in the present study population. Marmamula et al. report that cataracts and refractive error were the leading cause of blindness[16]. Cataract was most prevalent in the age group of 51-95 years (46.34%). According to Mehari ZA et al. and Puri DS, Cataract was also most prevalent in the age group of 51-70years (19.3%) and the second significant contributor to ocular morbidities occupied by this cataract[17,18]. In the present study, the second major cause of ocular morbidity was a refractive error, followed by Allergic conjunctivitis, Dry eye, Pseudophakia, Corneal FB, SCH, Pterygium, Corneal scar, corneal ulcer, Glaucoma, diabetic retinopathy, etc.

Sehgal et al. reported that 36.10% of people belong to the elderly with refractive error and22.48% with cataracts. More or less similar results were observed by Singh et al. (25.8%), who found that 40.8% of participants with the refractive error were present in rural central India. In other studies by Mishra, Srivastava et al. found that older age and education were strongly associated with ocular morbidity. Although the odds of ocular morbidity were higher in females, it was not statistically significant (p>0.05).4,16,19,20

According to Singh et al., the leading cause of ocular morbidity was cataracts (41.9%), uncorrected refractive error (21.59%), Xerophthalmia (10.20%) and glaucoma (4.83%) in an elderly population. The difference in the pattern of ocular morbidity may be due to ethnic variations partly because of living and lifestyle conditions in addition to different methodologies used.

In this study, the prevalence of ocular morbidity in the children age group was found to be 87.81% which is higher than the study conducted in Shilling city by Sarkar A et al., which was 76.7%.[21] In our study, the most common ocular morbidity in the children age group was Refractive error followed by allergic conjunctivitis, which was similar to the study done by Sarkar A et al. finding shows that highly reported ocular morbidity was Refractive error followed by Vitamin A deficiency. Mehari Z et al. found that ocular trauma was the most common ocular morbidity in central Ethiopia in the paediatric population.[17] The proportion of ocular injuries is higher in developing countries and consists of a largely preventable cause of monocular visual impairment and Blindness. Kumar A et al. found 41.3%, while Singh et al. observed it to be 9.56%. Shrote et al. reported32.1%, and Aggrawal et al. reported 53%. In the present study, Refractive error was the most common ocular morbidity in the agegroup4-17, with a prevalenceof28.66%. These results were comparable with Gupta et al.[22] who also found refractive error as the most common disorder with a prevalence of 22%. Das et al.[23] in Kolkata and Desai et al. in Jodhpur also reported a similar prevalence of 25.11% and 20.8%, respectively.

Blepharitis was present in 2.25% of children in our study, comparable to the 1.6% prevalence reported by Desai et al.[24] In difference may be due to differences in race, region, and weather conditions. Amblyopia was 1.80% in our study in the children age group, while Wedner et al.[25] reported a similar rate of Amblyopia which was 1.04%. The prevalence of glaucoma (1.3%) in the age group 18-50 years is lower than the several studies reported. The prevalence of glaucoma has been found to range from 2.6 to 7.2%.

The prevalence of corneal opacity in the adult age group was 2.19% in this study, less than the study done by Singh et al. Reported 2.99% of people over 50 years of age. Poor knowledge about ocular health coupled with poor availability of resources and the use of eye healthcare services might be a possible cause for corneal opacity. Despite the encouraging results of the present study, caution should be exercised before generalizing the results in a rural population.

Conclusion:

Prevention and treatment of ocular disease by regular screening of students would reduce ocular morbidity. Regular screening of school children is essential to improving the quality of their eyes. Screening and early referral of populations in need of specialized ophthalmic care should be emphasized. Campaigns regarding surgical correction for cataracts should be strengthened. Health education should relay to the community regarding healthy eye care practices, causes, preventive measures, appropriate treatment of morbid ocular conditions, a diet rich in vitamin A, ocular hygiene, and vitamin A prophylaxis programs, especially for the mothers of under-fives. The present study exposes the demographic factors and clinical parameters of ocular disease. The community-based cross-sectional study provides data related to the quantity of risk of ocular morbidity with individual factors, which will be beneficial to get a solution and reducing the risk. People should

get aware of eye care services and appropriate treatment. The government and healthcare practitioners should take responsibility for reducing ocular morbidity.

As this study includes an age group of 4- to 95 years of people, people less than four were excluded from the study. If we find out the pattern of ocular morbidity in less than four years of age group, it could give a better result for a particular area.

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