Original Article

Prevalence of Oculo-Visual Disorders amongst University Students in Varanasi District, North India

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Purpose : (a) To estimate the magnitude of various Oculo-visual disorders amongst the University students (b) to find out the factors responsible for the cause of ocular disorders and (c) to suggest possible intervention and preventive strategies for the same.

Material and Methods: This Prospective study was conducted in Student Health Care Complex and Department of Ophthalmology, Sir Sundar Lal Hospital, Institute of Medical Sciences of Banaras Hindu University, Varanasi, India. 20,680 students between 15 – 45 years age group were included in this study, which was carried out from September 2009 to August 2010. A detailed clinical history and complete ophthalmic examination of all the students was conducted including best corrected visual acuity, refraction, slit lamp biomicroscopy, Intra Ocular Pressure (IOP) measurement, extra ocular movements and fundus evaluation with direct ophthalmoscope. Clinical details were recorded in a pre-designed and pre-tested proforma. After a thorough examination, a provisional ocular diagnosis was made and treatment started accordingly.

Result: Out of the 20680 students who visited university students' health care complex, 4054 had various ocular disorders. The commonest ocular morbidities observed were refractive errors (39.78%) followed by conjunctivitis (30.64%), blepharitis (16.85%), computer vision syndrome (10.73%), stye (8.68%), ocular injuries (8.16%) and others (1.92%). 18.92% students had more than one ocular disorders.

Conclusion: Majority of these ocular morbidities need attention as they are preventable and treatable. Hence health education, regular eye checkup and screening are advocated.

Ocular problems are frequently noted in the student community can affect the student's performance in University and restricts their chances in educational and occupational opportunities. Studies on ocular morbidities amongst University students are few and largely confined to school children[1-7]. This study was therefore designed to estimate the prevalence of ocular disorders among students of a large residential university and also to determine the factors responsible for ocular disorders and to suggest possible intervention and preventive strategies. Information obtained from the study will help university administration in planning primary eye care in university student's health care complex.

MATERIAL AND METHODS

This prospective, non-randomized, selectively analyzed, single-centre pilot study was conducted amongst university students of a large residential university with more than 30,000 students enrolled. Out of 20680 students who attended the university student's health care complex for various health problems, 4054 students with various ocular disorders

were included in this study from September 2009 to August 2010.

All the students underwent a detailed clinical history including present and past complaints, their routine study hours, use of computers and spectacles history. Ocular examination included visual acuity (unaided, pinhole and with glasses) assessed by using Snellens chart from a distance of six meters, extra ocular movements, alignment, cover tests, convergence test using RAF rule, retinoscopy under mydriasis and subjective refraction. Colour vision test with the help of Ishihara chart, anterior segment examination with torch, magnifying binocular loupe, fundus examination with direct ophthalmoscope and slit lamp biomicroscopy were also done. The particulars were recorded in a pre-designed and pre-tested Proforma.

The diagnostic criteria of refractive errors used in our study are as follows: Myopia was diagnosed if refractive error was minus 1.0 diopter spherical or more, hypermetropia was diagnosed if it is plus 1.0 diopter spherical or more and astigmatism was recorded if it is more than 0.75 diopter cylinder and anisometropia with difference of one dioptre spherical equivalent in between two eyes.

Data was analyzed by using SPSS. The Chi Square test of significance was applied to analysis. A p value of less than 0.05 was considered as significant.

RESULTS

Out of 20680 students who visited the university student's health care complex in one year period, 4054 (19.6%) had ocular diseases. Amongst them 2894 (71.39%) were males and rest 1160 (28.61%) were females. 1873 (46.20%) were those students who belonged to IT, Medical, Management and research stream (technical students) and 2181 (53.80%) were from arts, science, social sciences and other allied subjects (general stream students). The prevalence of ocular diseases was highest (38.83%) amongst 20-24 years age group, followed by the 25-29 years (25.33%) and 15-19 years of (25.06%) (Table 1).

Ocular disorders were more prevalent in male study subjects (2894, 71.39%). The major ocular disorders observed in the study were refractive errors, conjunctival disorders, lid disorders, computer vision syndrome and eye injuries (Table 2). 3287 (81.08%) students had single ocular morbidity while 767 (18.92%) had more than one ocular morbidity (Table 3). Out of 767 study subjects who presented with more than one ocular morbidity, 263 (6.49%) belonged to age group 20 – 24 years.

Refractive error was the most prevalent ocular disorder occurring in 1613 (39.78%) students. The prevalence rate for myopia was 21.41% as compared to hypermetropia (14.89%) and astigmatism (3.48%), which was statistically significant (χ^2 test of significance). The refractive error was more prevalent among males (967, 23.85%) as compared to females (646, 15.93%) (Table 4). Refractive error was more common among the technical students (22.20%) like students of IT, Medical, Management and research stream as compared to students of general stream (17.58%). In this study myopia of less than -3 diopter spherical was found in 12.38% and relatively high myopia (more than -6 diopter spherical) was observed in 9.03% cases. Higher grades of myopia was more prevalent in female students. The incidence of myopia gradually decreased with advancement of age.

Conjunctival diseases were the second most common ocular morbidity observed in 1242 (30.64%) students. Allergic conjunctivitis was observed in 603 (14.87%) students. Infective (bacterial/viral) conjunctivitis due to epidemics was seen in 618 (15.24%) students while 21 (0.52%) students had contact lens related conjunctival disorders. Disorders of the lid were the third common cause of ocular morbidity. 683 (16.85%) students had blepharitis, 352 (8.68%) had stye while 435 (10.73%) students had computer vision syndrome. 331 (8.16%) study subjects had various eye injuries including insect crawling and foreign body (Table-2). Other less common ocular disorders observed in this study were squint (0.52%), ptosis (0.30%), posterior segment pathology (0.91%) and colour blindness (0.07%) (Fig. 1). Prevalence of ocular disorders weas higher during March to October, with peak in month of September (13.07%) and August (11.98%).

DISCUSSION

Out of the 20680 study subjects, 4054 (19.6%) had ocular disorders. Prevalence rate of ocular morbidity amongst school going children as reported in various studies were Rajesh Kumar et al. (24.6%)[1], Ajaiyeoba AI et al. (15.5%)[8], Rosek et al. (28.8%)[9] and Nepal BP et al. (11.0%)[3]. In our study prevalence of ocular morbidity decreased with age, with minimum of 152 (3.75%) in age group 35 years and above and maximum of 1574 (38.83%) in 20 – 24 years age group, which was clinically significant ($P<0.05$, χ^2 test of significance). Unlike this study Rajesh Kumar et al[1]

Table 1: Distribution of ocular morbidity according to age and sex

Age group (Yrs)	Male n %)	Female n (%)	No. of patients n (%)
15-19	706(17.41)	310(7.64)	1016(25.06)
20-24	1166(28.76)	408(10.06)	1574(38.83)
25-29	689(17.00)	338(8.34)	1027(25.33)
30-34	159(3.92)	79(1.95)	238(5.87)
35-39	104(2.57)	19(0.47)	123(3.04)
>40	70(1.73)	6(0.15)	76(1.87)
Total	2894(71.39)	1160(28.61)	4054(100.0)

Table 3: Distribution According to Age and Number of Morbidity

Age group (Yrs)	One Disease n (%)	Two Disease n (%)	No. of patients n (%)
15-19	844 (20.82)	172(4.24)	1016(25.06)
20-24	1311(32.34)	263(6.49)	1574(38.83)
25-29	817(20.15)	210(5.18)	1027(25.33)
30-34	140(3.45)	98(2.42)	238(5.87)
35-39	102(2.52)	21(0.52)	123(3.04)
>40	73(1.80)	3(0.07)	76(1.87)
Total	3287(81.08)	767(18.92)	4054(100.0)

Table 4: Distribution of Refractive Errors

Type of Refractive error	Male n (%)	Female n (%)	No. of patients n (%)
Myopia	476(11.74)	392(9.67)	668(21.41)
Hypermetropia	401(9.89)	203(5.00)	604(14.89)
Astigmatism	90(2.22)	51(1.26)	141(3.48)
Total	967(23.85)	646(15.93)	1613(39.78)

Table 2: Distribution of Ocular Morbidity by Type

Ocular morbidity	No. of patients n (%)
Refractive errors	1613(39.78)
Conjunctivitis	1242(30.64)
Blepharitis	683(16.85)
Computer Vision Syndrome	435(10.73%)
Stye	352(8.68%)
Traumatic Eye Injury	331(8.16%)
Others	78(1.92%)
Total	4054(100.0)

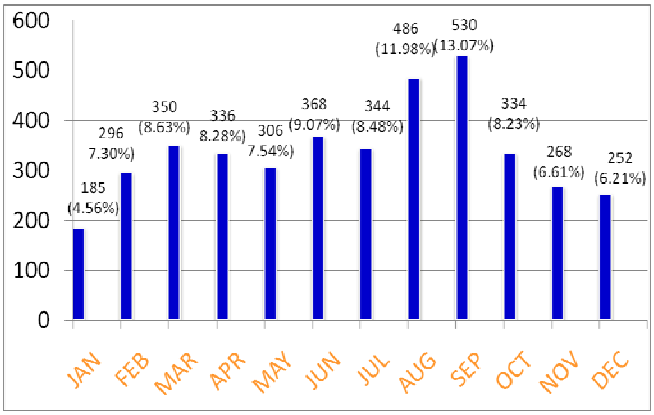

Fig. 1 : Month wise distribution of ocular morbidity

reported increased prevalence of ocular morbidity with age, being minimum (17.5%) in 5 – 6 years age group and maximum (37.5%) in 30 – 40 years age group. This is because both the study used population of non-comparable age. Studies of ocular morbidity among University students could not be found in literature despite our best efforts.

The distribution of ocular morbidities in this study were refractive errors (39.78%), Conjunctivitis (30.64%), Blepharitis (16.85%), computer vision syndrome (10.73%), Stye (8.68%), eye injury (8.16%) and others (1.9%) quite in contrast to the study done in school children where refractive errors (5.4%) are followed by conjunctivitis (4.6%), trachoma (4.3%) and vitamin A deficiency (4.1%)[1].

The number of students with two or more ocular diseases was 767 (18.92%), which was higher as compared to studies on school children (4%)[1]. This is due to cumulative effect of diseases like refractive error and conjunctivitis, as there is possibility of greater exposure to pathogen/allergen in older students on account of more outdoor activities leading to higher incidence of conjunctivitis. The ocular morbidities were more in summer and rainy seasons with peak during month of August (11.98%) and September (13.07%), this is most likely due to outbreaks of epidemic conjunctivitis and entomological factors like insect crawling, insect bite etc. The prevalence was least in month of January (4.54%) due to cold climate, which limits outdoor activities, University examination and low attendance of students in university students in health care complex.

In this study, refractive error was the most prevalent ocular disorder seen in 1613 (39.78%) students, which is greater than the WHO's range of 2-10%.[10] Refractive errors were the most common ocular problems in the various studies conducted by Ajaiyeoba AI et al (5.8%),[8] Rajesh Kumar et al (5.4%),[1] Nepal BP et al (8.1%),[3] Adegbehingbe BO et al (13.5%)[11] and Ho C-SD et al (22.3%).[12] In our study refractive error was slightly more common in technical students (22.2%) than non-technical ones (17.58%). Similar pattern was observed in study conducted amongst the Singapore teenagers (uncorrected refractive error among express students 19.6%, normal academic students 20.5% and technical students were 31.1%)[12]. Among the refractive errors, myopia was most common, constituting 21.41% followed by hypermetropia (14.89%) and astigmatism (3.48%). However, findings of Kleinstein RN et al. study (Myopia 9.2%, hyperopia 12.8% and astigmatism 28.4%)[9] and Nepal BP et al. study (Myopia 4.3%, hypermetropia 1.3% and astigmatism 2.5%)[3] are contrary to our findings. Amongst diseases of conjunctiva, infective (15.24%) and allergic conjunctivitis (14.87%) were the most common, which may be due to increase in concentration of allergens in University campus, over crowding and poor ocular hygiene among students. Contrary to our finding prevalence of allergic conjunctivitis was reported to be 49% by Adegbehingbe BO et al[11] and 7.4% by Ajaiyeoba AI et al[8]. Third common cause of ocular disorders was diseases of lids like blepharitis (16.85%) and stye (8.68%), which did not pose any threat to vision. The environmental factors including poor ocular hygiene, acne, seborrhic dermatitis or dandruff may contribute to the aetiology of above diseases of the eyelids in our study.

Computer vision syndrome was seen in 10.73% university students, majority of whom belonged to technical students having tendency of late night study and prolonged work on computer.

CONCLUSION

Majority of ocular problems observed in our study were either preventable or treatable. To reduce ocular morbidity amongst university students, health education towards eye care, regular eye examination, correction of refractive errors and use of protective eyewear are advocated.

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REFERENCE

1. **Kumar R, Dabas P, Mehra M, et al.** Ocular morbidity amongst primary school children in Delhi. Health and Population-prospective and Issues. 2007, 30; 222-9.
2. **Gupta M, Gupta B.P., Chauhan A.** Ocular Morbidity prevalence among school children in Shimala Himanchal, North India. Indian Journal of Ophthalmology, 2009; 57: 133-8.
3. **Nepal BP, Koirala S, Adhikary S., et al**. Ocular Morbidity in School Children in Kathmandu. Br J Ophthalmol. 2003; 87: 531-4.
4. **Fotouhi A, Hashami H, Khabazkhoob M, et al.** The prevlanece of refractive errors among school children in Dezful, Iron. Br. J. Ophthalmol. 2007; 91: 287-92.
5. **Wedner SH, Ross DA, Todd J et al.** Myopia in secondary school students in Mwanza City, Tanzania : The need for a national screening programme. Br J Ophthalmol. 2002; 36: 1200-6.
6. **Maul E, Barroso S, Munoz SR et al.** Refractive error study in children : Results from La Florida, Chile. Am J Ophthalmol. 2000; 129: 445-54.
7. **Zhao J, Pan X, Sui R, et al.** Refractive error study in children results from Shunji District China. Am J Ophthalmol. 2000; 129; 427-35.
8. **Ajaiyeoba AI, Sawumi MAI, Adeoye AO, et al.** Ohileye. Prevalence and causes of eye diseases amongst students in South Western Nigeria. Annals of African Medicine. 2006; 5:, 197-203.
9. **Rose K, Younan C, Morgan I et al.** Prevalence of undetected ocular conditions in a pilot sample of school children. Cln. Exp. Ophthalmol. 2003; 31: 237-40.
10. **Wedner SH, Foster A.** Prevalence of eye diseases in primary school children in a rural area of Tanzania. Br J Ophthalmol. 2000; 84: 1291-7.
11. **Adegbehingbe BO, Oladehinde MK, Majemgbasan TO, et al.** Screening of Adolescents for eye diseases in Nigerian High schools. Ghana Medical Journal. 2005, 39, 138-42.
12. **Ho C-SD, Ng C-BC, Chan E, Ngeon A et al.** Uncorrected refractive error in Singapoore teenagers. Br J Ophthalmol. 2006; 90: 202-7.
13. **Kleinstein RN, Jones LA, Hullett S, et al.** Refractive error and ethnicity in children. Arch Ophthalmol. 2003; 121: 1141-7.