Article Title: An observational study on the prevalence of refractive error in rural place of Tripura,India

Moumita Majumdar, Dr Kailash Chandra Verma, Dr Rabindra Das
Phd Scholar, Professor & Guide, Ophthalmologist & Co-Guide
Nims University,Rahasthan

Abstract:

In recent years, several epidemiological studies related common eye diseases, in addition, prevalence and its complications related to blindness and low vision problem, have been conducted in different regions of India. Although, here remains some significant ignorance due to prevalence of visual acuity problem within the Tripura state, especially among the residing people of the rural areas of state.

164 patients take part of this study; place defined the sample size. Patients were screened, and their visual acuity was measured by standard Snellen's distance visual acuity chart for educated patients and the 'Tumbling E' eye chart for illiterate participants from a distance of 6 meters. To ascertain refractive errors, both objective and subjective refraction were performed for the study. The anterior region of eye was checked by the torchlight and slit lamp biomicroscope as per need. The visual acuity of each patient was converted into Logarithmic visual acuity chart for the purpose of final statistical calculations. A total of n=164 patients were assessed and screened to evaluate ocular morbidity for the study. Among them, 64 patients reported experiencing dimness of vision at a distance, all of them have refractive errors. The majority of the individuals are using spectacles; however, 7 patients do not use any optical aids and are unaware of their visual impairment. Of the remaining participants, 93 have never had their vision or eyes examined, while others have checked their vision once or twice but do not have any visual issues. Particularly myopia is increasingly recognized as one of the biggest challenges for visual impairment, a substantial gap in awareness and corrective measures still exists. Boosting awareness campaigns and ensuring regular screenings in particularly rural areas could significantly lessen the risks posed by uncorrected refractive errors.

Keyword: Refractive errors, Myopia, visual impairment, blindness, low vision, visually handicap, vision awareness, prevalence study, vision screening

Introduction: Uncorrected vision is one of the extensive reasons for the avoidable visual impairment and effects on the person of each and every age group and socio-economic status. Usually, visual acuity problems are discovered at an early age. In addition, due to this rising problem, blind people's numbers are increasing day by day. This research shows the variations of the prevalence of nearsightedness and farsightedness and it continues with increasing the numbers of refractive errors.

Regardless of the vast amount of information in respect of refractive error's numbers in southeast Asia like Japan, Singapore, China, Taiwan, Hong Kong, etc.; some research reported with the huge number of ametropia and their causative factors have been confined to the northern regions. A public opinion survey was performed on the rural people near Hyderabad city in India3. Now, India is one of the largest populated countries. Some studies reveal that the study and discussion regarding the rising prevalence of visual acuity problem and its complications

between the people of India are limited. For that reason, this research needs to recognize this crucial situation and changing tendency of refractive error's prevalence as well as associated reasons for it.

Consequently, uncorrected refractive errors are one of the distinguishing causes of decreased visual acuity and it disturbs the academic performance of college going students. College going students are one of the effective groups for this type of research purpose, because maximum participants of this group are easily accessible for the examination purposes and offer excellent opportunities for health education and services.

Methods: The study was prospective research for investigating the prevalence of visual acuity problem in rural people of Tripura. Age-related patterns of refractive error, gender identity was analyzed in this study. When subjects come for eye check-up then only subjects included for the study.Vision was calculated by 6m using Snellen's distance vision chart. At first, the right eye (OD) was examined and then the left eye (OS), both vision (with or without spectacles), in case the participant brought the previous glass. A focimeter was used for checking previous glass power. With the help of a slit lamp biomicroscope, I checked the anterior portion of the eye. After the visual acuity check, I did the objective refraction by streak retinoscope. The subjective refraction was executed on the participant, whose vision was less than 6/9. After the examination process, a questionnaire was assessed by the individuals for awareness regarding vision and refractive error.

The inclusion standards for the research were subjects of 18years to 22years, whose vision was below 6/9 and subjects gave their consent and all of them residing in rural places of Tripura. Patients having refractive error only and other ocular degeneration and traumatic cases were eliminated from this study. While the subject visited for eye examination, her/his prevalence was calculated in percentage form. The sample was calculated by simple statistics.

Results: A quantity of 164 patients in the age group of 18 to 22years with refractive error participated in this study. The mean age of subjects was 20±2years (mean ± standard deviation). investigation of refractive error in the people in whom two eyes (328eyes) was involved revealed that maximum number Among them, 64 patients (128eyes) reported experiencing dimness of vision at a distance, all of them have refractive errors. The majority of the individuals are using spectacles; however, 7 patients do not use any optical aids and are unaware of their visual impairment. Of the remaining participants, 93 have never had their vision or eyes examined, while others have checked their vision once or twice but do not have any visual issues.

Among them a total number of 71 participants (142 eyes) detected by refractive errors. The most common causes of refractive error were found to be myopia in 61 participants(122eyes) and hypermetropia in 10participants(20eyes) as compared to 64participants having refractive error earlier but not using the glass in regular basis but unfortunately participants were newly detected by refractive errors in both eyes. Apart from this, 35male and 26female myopic participants were included for this study and 2male and 8female hyperopic patients were assessed here. Amongst all the subjects, 32.31% (53 participants) were aware about the refractive errors and remaining 67.68% (111 participants) not aware about the refractive errors and its complication.

Definition of factors used in this research are concluded in table 1, table2, table3 and table4.

Table1: Percentagewise distribution of Myopic patient and Hypermetropic patients

Types of Refractive errors	Total Number Patients
Myopia	61(85.91%)
Hypermetropia	10(14.08%)

Table2: Percentage distribution of patient's gender

Types of Refractive Errors	Male	Female
Myopic Participants	35(57.37%)	26(42.62%)
Hypermetropic Participants	6(60.0%)	4(40.0%)

Table3: Percentage distribution of using spectacle and not using spectacle participants

Refractive Error wise Distribution	Using Spectacle	Non using Spectacle
Myopic Patient	25(40.98%)	36(59.01%)
Hypermetropic Patient	2.0(20.0%)	8.0(80.0%)

Table4: Percentage wise distribution of aware and non-aware about refractive error and vision

Total participants	Aware Participants	Not Aware Participants
164	53(32.31%)	111(67.68%)

Discussion:

According to this study, 85.91% participants had myopia and 14.08% participants had hypermetropia. The strong association with visual difficulties means inability to see the board from the back of the classroom and students with refractive error need early identification and intervention. Unfortunately, in this modern era, the maximum number of participants were unaware of their vision status. In addition, amongst all the participants, 32.31% were aware about the refractive errors and its relevant complications and others 67.68% individuals were not aware about this.

Here, it had been established that the prevalence of refractive errors was little higher in male individuals in comparison with females. Uncorrected refractive errors can lead to several difficulties like academic issues, headache and potential progression to higher degrees of refractive errors. This lack of compliance with optical aids use may stem from factors such as social stigma, discomfort, cost issues or negligence – all of this need to be explored further in future studies. While this research comes up with profound understanding and it has some restrictions. The sample number, however adequate for initial analysis, should not fully represent a broader range of citizens of rural Tripura or other states. Additionally, factors such as genetic predisposition, screen time and outdoor activity lever were not analyzed here which also could provide a more comprehensive understanding of refractive error risk factors.

Conclusion: In this observational research, a total number of male subjects were aware about the refractive error and its relevant complication but female participants were little bit behind. Myopia is the major reason for refractive error in the Tripura state also but not knowing about the complication regarding this is highly alarming

for us. We need to check the refractive error on a regular basis and need collective efforts from the various contributors like health workers, educational professionals and parents to control the rising matter.

References:

1. Dr. Brien A Holden et al. Global Prevalence of Myopia and High Myopia and Temporal Trends from 2000 through 2050;2016 May;123(5).1036 42.doi:10/j.ophtha.2016.01.006.epub 2016 Feb 11
2. Dandona L, Dandona R. et al. Global visual impairment due to uncorrected refractive error. 2008; 86: B-C.
3. Dandona R, Dandona L, Srinivas M, et al. Refractive error in children in a rural population in India. Invest Ophthalmol Vis Sci. 2002;43:615-622.[PubMed]
4.Zhao J, Pan X, Sui R, Munoz SR, Sperduto RD, ellwein LB. Fefractive error study in children: results from shunyi district, China. Am J Ophthalmol. 2000; 129:427-435
5.Pokharel GP, Negrel AD, Munoz SR, Ellwein LB. Refractive error study in children: results from Mechi Zone, Nepal. Am J Ophthalmol.2000;436-444[CrossRef] [PubMed]
6. Maul E, Barroso, Munoz SR, Sperduto R, Ellwein LB. Refractive study in children: sampling and measurement methods for a multi-country survey. Am J Ophthalmol. 2000;129:421-426
7. Dandona R, dandona L, Naduvilath Tj, et al. Refractive errors in an urban population in southern India: The Andhra Pradesh eye Disease study. Invest Ophthalmol Vis Sci. 1999;40:2810-2818[pubMed]
8.Limburg H, Vaidyanathan k, Dalal HP.Cost effective screening of school children for refractive errors. World Health Forum.1995;16:173-178[PubMed]
9.the Framingham Offspring Eye Study Group. Familial aggregation and prevalence of myopia in the Framingham offsring eye study. Arch Ophthalmol. 1996;114:326-332[CrossRef][PubMed]
10. Fledelius H.c Myopia prevalence in Scandinavia.Acta Ophthalmol. 1988;185(suppl)44-50
11.Garner lF, Meng CK, Grosvenor TP, Mohiden N. ocular dimensions and refractive power in Malay and Melanesian Children. Ophthalmic Physiol Opt.1990;10:234-238[Crossref][pubMed]
12.Turacli ME, Aktan SG, Duruk K. Ophthalmic Screening of school children in Ankara. Eur J ophthalmol. 1995;5:181-186[PubMed]
13.Saw SM, Katz J, Schein OD, Chew SJ, Chan TK. Epidemiology of myopia.Epidemiol Rev. 1996;18:175-187.[CrossRef][PubMed]
14.Garner LF, Owens H, Kinnear RF, Frith Mj. Prevalence of myopia in sherpa and Tibetan children in Nepal.Optom Vis Sci. 1999;76:282-285[CrossRef][PubMed]