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Original Article

Visual Impairment Due to Refractive Errors among Female School Students Attending Tertiary Care Hospital, Ananthapuramu

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Abstract

Introduction: Refractive errors are of various types, predominantly affecting school going children. Mostly in developing countries, refractive errors are responsible for either visual impairment of blindness. The aim of this study is to know the prevalence of refractive errors among female schoolchildren of 7-18 years age group and assessment of socio-demographic features among myopia children.

Materials and Methods: This is a prospective cross-sectional study conducted for 1 year (2014) among female schoolchildren attending the Department of Ophthalmology at Government General Hospital, Ananthapuramu. A total of 1600 female schoolchildren presenting with complaints of visual impairment were examined by standard ophthalmic procedures such as Snellen chart, slit-lamp examination, retinoscopy, and ophthalmoscopy to detect refractive errors.

Results: Out of 1600 schoolchildren, 1424 (89%) had myopia, 75 (4.6%) had hypermetropia, and 101 (6.3%) had astigmatism. Most of the female schoolchildren were presented to the outpatient department complaints of difficulty in seeking blackboard from back benches and headache/eye ache. Out of 1600 children, only 768 (48%) were attending routine eye checkups yearly once at various hospitals, 262 (16.3%) and 112 (7%) were attending 2 and 3 years once, respectively, and 458 (28.6%) did not have eye checkups at all.

Conclusion: Government and non-government organizations are helping a lot in India in reducing the incidence of visual impairment. Individuals should aware and support these organizations by seeking medical advice, which will reduce the visual impairment incidence.

Key words: Female schoolchild, Myopia, Refractive errors

INTRODUCTION

Since the last three decades, recognition of concept of avoidable blindness (i.e., preventable or curable) is rising. For prevention of blindness, major global initiatives have taken. They are: WHO: Prevention of Blindness Programme (1978), Vision 2020 - The right to sight (1999) and vision for the future (2001). Refractive errors are the one among five major blinding eye conditions taken by WHO globally for immediate attention to achieve the goals of Vision 2020.[1]

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Blindness problem has gained importance globally; its magnitude is much higher in India. Of the estimated 45 million, India alone has 9 million blind people, which comes to one-fifth of the total in world.[2]

Refractive errors are of various types, predominantly affecting school going children. It is one of most common public health problem, which is treatable eye condition. Refractive errors are common cause of visual impairment, second treatable blindness. It is estimated that there are 35 million people in the world who require low vision care and 8 million (18%) are blind due to refractive errors.[2] During survey period, blindness National Programme for Control of Blindness survey (2001-2002)[3] reported 19.7% refractive

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errors, and rapid assessment of avoidable blindness survey (2006-2007)[4] reported 6.3% of refractive errors responsive for blindness.

Mostly in developing countries, refractive errors are responsible for either visual impairment of blindness.[5] Children may not be aware of this problem. Usually, they will not complain of defective vision. Visual impairment problems hinder their education, personality development, and career opportunities, in addition to causing an economic burden on society.[6]

Awareness has to create among schoolchildren, parents, guardians, and teachers regarding refractive errors. School health programs are helping to screen schoolchildren with visual impairment. Many school health programs were supplementing the vitamin A to reduce the nutritional deficiency visual impairment.

The aim of this study is to know the prevalence of refractive errors among female schoolchildren of 7-18 years age group and assessment of socio-demographic features among myopia children.

MATERIALS AND METHODS

This is a prospective cross-sectional study conducted for 1 year (2014) among female schoolchildren attending the Department of Ophthalmology at Government General Hospital, Ananthapuramu. The study has started after Institutional Ethical Committee approval and consent form studied population.

Female schoolchildren with the age group of 7-18 years were included in this study. Children presenting in ophthalmology outpatient department (OPD) with complaints of ocular manifestations other than refractive errors were excluded from the study.

Based on various literature, sample size was estimated. A total of 1600 female schoolchildren presenting with complaints of visual impairment were examined. Children wearing spectacles were also examined, and change in visual acuity was noted.

Details regarding age, socio-demographic features, and standard questionnaire related to visual impairment were documented. All the data were entered into excel sheet and kept unlinked anonymously.

Children were examined by standard ophthalmic procedures such as Snellen chart, slit-lamp examination, retinoscopy, and ophthalmoscopy to detect refractive errors. Visual acuity was measured and advised for correction, those with uncorrected visual acuity of 20/40 or worse in either eye underwent refraction under cycloplegia. Children with ocular morbidities were treated accordingly.

RESULTS

A total of 1600 female schoolchildren were included in this study. Age group of 7-18 years children presenting with complaints of visual impairment were selected to do this study.

Refractive errors were predominantly seen in the age group of 11-15 years followed by 7-10 and 16-18 years. Out of 1600 schoolchildren, 1424 (89%) had myopia, 75 (4.6%) had hypermetropia, and 101 (6.3%) had astigmatism. Myopia was the predominant type among refractive errors (Table 1).

Most of the female schoolchildren were presented to the OPD complaints of difficulty in seeking blackboard from back benches and headache/eye ache (Table 2). Out of 1600 schoolchildren, 1225 (76.5%) were complaining of difficulty in seeking blackboard from back benches, 984 (61.5%) were complaining of headache/eye ache, 35.1% were suffering from eye strain after near work like reading, 50.8% were half-shutting their eyes for better vision, 51.4% were having discharge from eyes, and 19.6% were presented with itching of eyes.

On assessing the correlation of family history of schoolchildren regarding refractive errors, it was observed majority of female schoolchildren had family history of visual impairment in single parent followed by no family

Table 1: Age distribution of refractive errors

Type of Refractive errors	Age (%)			Total
	7-10 years	11-15 years	16-18 years	
Myopia	363 (25.4)	878 (61.6)	183 (12.8)	1424
Hyper metropia	19 (25.3)	47 (62.6)	9 (12)	75
Astigmatism	26 (25.7)	54 (53.4)	21 (20.7)	101
Total	408 (25.5)	979 (61.1)	213 (13.3)	1600

Table 2: Various presenting complaints of school children

Presenting complaints	Number of children *n*=1600 (%)
Difficulty in seeing blackboard from back benches	1225 (76.5)
Headache, eye pain	984 (61.5)
Eye strain after near work-like reading	562 (35.1)
Half-shutting of the eyes for better vision	814 (50.8)
Discharge from eyes	823 (51.4)
Itching of eyes	314 (19.6)

history of refractive errors (Figure 1). Among 1600 schoolchildren, 872 (54.5%) had family history of single parent, 453 (28.3%) had no family history, 218 (13.6%) had family history of siblings, and 57 (3.5%) had both parents refractive error. 132 (8.2%) children had family history of both siblings and single parent refractive error.

Refractive errors were assessed by correlating with various socio-demographic features. Socioeconomic status (SES) was assessed by modified Kuppuswamy scale. Out of 1600 children, 658 (41.1%) were upper lower class, and 565 (35.3%) were lower middle class. Many of the female children with refractive errors belong to lower SES (Table 3).

Out of 1600 children, only 768 (48%) were attending routine eye checkups yearly once at various hospitals, 262 (16.3%) and 112 (7%) were attending 2 and 3 years once, respectively, and 458 (28.6%) did not have eye checkups at all (Figure 2).

DISCUSSION

Refractive errors were the second most common cause of visual impairment. Refractive errors are treatable cause and can decrease its incidence by school health programs or health education in communities.

We have selected female gender of schoolchildren to investigate refractive errors in this study because female gender is usually neglected in few communities since birth, reasons for these may be low SES, illiteracy, bad beliefs, less food supplements, and also showing less interest in seeking to medical care toward female child. Many studies also reported that refractive errors were common in females.[7-9]

Table 3: Socio-demographic profile of female school children

Socio-demographic features	Number of schoolchildren (%)
SES	
Upper	79 (4.9)
Upper middle	204 (12.75)
Lower middle	565 (35.3)
Upper lower	658 (41.1)
Lower	94 (5.8)
Religion	
Hindu	804 (50.2)
Muslim	518 (32.3)
Christian	226 (14.1)
Others	52 (3.2)
Caste	
ST	216 (13.5)
SC	442 (27.6)
BC	357 (22.3)
OC-General	585 (36.5)

SES: Socioeconomic status

Refractive errors were predominantly seen in the age group of 11-15 years followed by 7-10 and 16-18 years in the present study. Khader *et al.*[10] found lowest for the youngest age group (7.8%) and increased until it reaches 20.6% for 14 years children. After that age, prevalence decreased gradually. Lin *et al.*[11] documented that among the schoolchildren in the age 7, 12, and 15 years, the prevalence of myopia was 20%, 61%, and 81%, respectively, and Kalikivayi *et al.*[12] reported that the prevalence of myopia was significantly higher among children aged >10 years compared to those <10 years.

In this study, out of 1600 schoolchildren, 1424 (89%) had myopia, 75 (4.6%) had hypermetropia, and 101 (6.3%) had astigmatism. Myopia was the predominant type among refractive errors.

Kumari and Lakshmi[13] documented that major refractive error was myopia (89.8%) followed by astigmatism (6.1%) and hypermetropia (4.1%). A study by Dulani and Dulani[14] found myopia at 63.4% and astigmatism (25.8%) followed by hypermetropia (11.35%). Rohul *et al.*[15] observed that myopia as 59.59% followed by astigmatism (35.23%) and hypermetropia (14.17%). In contrast to this study, lesser prevalence of myopia was observed by Kalikivayi *et al.*[12] and Dandona and

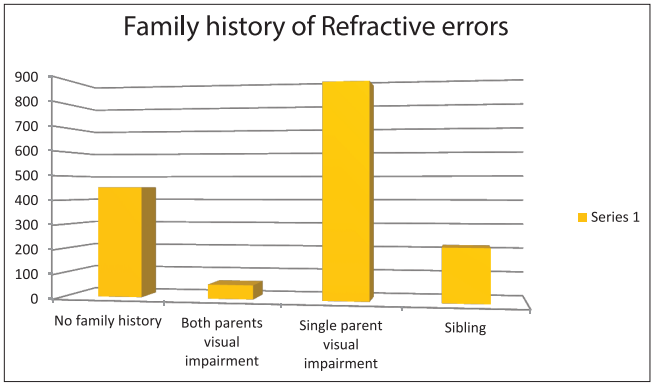

Figure 1: Number of students with family history of refractive errors

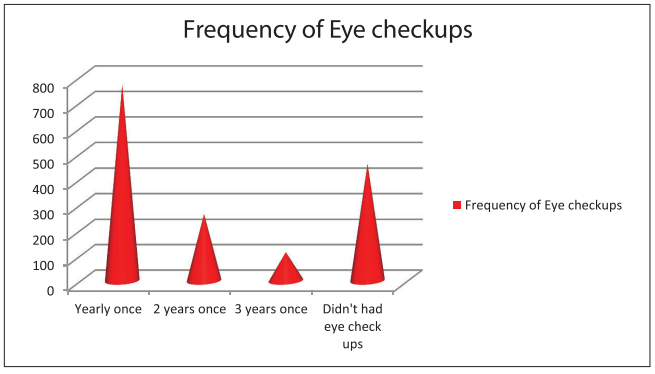

Figure 2: Frequency of eye checkups by schoolchildren

Dandona[6] was found to be 10%, 8.6%, and 4.44%, respectively.

As per this study, out of 1600 schoolchildren, 1225 (76.5%) were complaining of difficulty in seeking blackboard from back benches, 984 (61.5%) were complaining of headache/eye ache, 35.1% were suffering from eye strain after near work like reading, 50.8% were half-shutting their eyes for better vision, 51.4% were having discharge from eyes, and 19.6% were presented with itching of eyes.

Among 1600 schoolchildren, 872 (54.5%) had family history of single parent, 453 (28.3%) had no family history, 218 (13.6%) had family history of siblings, and 57 (3.5%) had both parents refractive error. 132 (8.2%) children had family history of both siblings and single parent refractive error. Studies done by Rohul *et al.*,[15] Ip *et al.*,[16] and Khader *et al.*[10] found that among myopic children 39.9%, 58.5%, and 56.4%, respectively, had a family history of myopia.

SES was assessed by modified Kuppuswamy scale. Out of 1600 children, 658 (41.1%) were upper lower class, and 565 (35.3%) were lower middle class. Many of the female children with refractive errors belong to lower SES. Ahmed *et al.*[8] observed that students from low socioeconomic conditions were having a higher prevalence of myopia when compared to students from higher SES.

Out of 1600 children, only 768 (48%) were attending routine eye checkups yearly once at various hospitals, 262 (16.3%) and 112 (7%) were attending 2 and 3 years once, respectively, and 458 (28.6%) did not have eye checkups at all as per this study. 28.6% of students did not have eye checkups, which is a quite significant; it signifies that less awareness regarding visual impairment.

Approach of vision 2020 toward refractive errors is to eliminate visual impairment (visual acuity <6/18) and blindness due to refractive errors or other causes of low vision.

CONCLUSION

From this study, we conclude that among refractive errors, myopia is the most common. Refractive errors were common in the age group of 7-15 years, students from low SES, with family history of myopia.

Health administrators or organizations should create awareness among schoolchildren, and their parents regarding refractive errors and also should demand them to seek medical advice as refractive services. Screening is necessary, as a school health programs among individuals with poor vision, refractive services, optical services, low vision services, all those needed for to avoid blindness resulting due to refractive errors. Government and non-government organizations are helping a lot in India in reducing the incidence of visual impairment. Individuals should aware and support these organizations by seeking medical advice, which will reduce the visual impairment incidence.

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