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Original Research Article

A Cross-Sectional Study Assessment of the Prevalence of Refractive Errors among the School-Going Children in Bihar Region

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Abstract

Aim: To report the prevalence of refractive error among the school students of Bihar region, India.

Material & Method: A cross-sectional study was conducted among the school children of Bihar over a period of 2 years. The screening was carried out in 5 schools which included primary and higher secondary schools. A total of 1002 children were screened for refractive errors.

Results: A total of 1002 school children were screened from 5 different schools of Bihar. Refractive error was highly prevalent in the age group of 14–17 years (*n* = 63). Regarding gender, out of 320 males, 11.25% (n=36) had refractive errors whereas 12.9% (n=88) out of 682 females. From a total of 1002 students studying in different schools, the prevalence of refractive errors was 12.4% (*n* = 124) among which myopia was the most common with 47.58% (*n* = 59), followed by 29.8% (n = 37) with astigmatism, and the remaining 22.5% of hypermetropia (*n* = 28).

Conclusion: The study gives relevant and baseline information on refractive error in Bihar school children. To acquire a fuller picture of refractive error and other eye-related disorders, broader research should be done in all of the state's schools to uncover vision problems as early as feasible.

Key words: Hyperopia, myopia, prevalence, refractive error

Introduction

An estimated 153 million people over 5 years of age are visually impaired as a result of uncorrected refractive errors, of which 8 million are blind. Approximately 12.8 million children in the age group 5-15 years are visually impaired from uncorrected or inadequately corrected Refractive errors, estimating a global prevalence of 0.96 %. [1] Poor vision and an inability to read material on the chalkboard due to refractive error can profoundly affect a child's participation and learning in the classroom. [2]

Many ocular diseases have their origin in childhood and the morbidity may go unnoticed and adversely affect the child's performance in school and may also cause severe ocular disability in the later part of life. [3] The pattern of ocular diseases varies in different part of the world and is influenced by racial, geographic, socioeconomic and cultural factors. [4] Ocular Morbidity is one of the recognized causes of poor performance of a child. It may be a source of performance anxiety among school children. [5]

Active screening and timely intervention at the right time will not only help in vision restoration but will also influence a child's growth and development. [6,7] In 1960, the Government of India constituted a school health committee which recommended medical examination of the children at the time of entry into school but this has hardly been in practice in our country. [8]

Hence, this study aims to report the prevalence of refractive error among the school students of Bihar, India.

Material & Method:

A cross-sectional study was conducted among the school children of Bihar region over a period of 2 years. The screening was carried out in 5 schools which included primary and higher secondary schools.

A total of 1002 children were screened for refractive errors. Permission was taken from the principals of the selected schools.

Methodology

An eye team consisting of a senior optometrist, junior resident and a senior resident visited the selected schools. The teachers were selected depending upon the total number of students in the school for the training program organized by the optometrists under the guidance of junior and senior residents. The teachers were sensitized about the magnitude of childhood blindness, their role in the early detection of vision problems, and other eye diseases. They were trained to screen the vision in each eye separately using the Snellen chart in their respective schools and to record questionnaires. An eye health education program was conducted for the students and teachers to make them aware of eye health. The children detected to have any ocular anomaly by the trained teachers were referred first to an optometrist, who did subjective correction by placing the appropriate lenses in the trial frame. The visual acuity tested with the Snellen chart placed at 6 m for any children with refractive errors and for children below 10 years cycloplegic refraction was done using Homatropine 2% eye drops after 2 h of instilling the drops. Lastly, those who still did not improve were referred to the base hospital for further complete ophthalmic examination by the ophthalmologist.

Refractive errors was diagnosed when the presenting visual acuity was less than 20/40 and improved to >20/40 with correction. Myopia was defined as measured objective refraction of >_-0.5D spherical equivalent in one or both eyes. Hyperopia was considered when the measured objective refraction of >_+2.0D spherical equivalent in one or both eyes was present. Astigmatism was considered when the measured objective refraction of >_0.75 D cylinder was there in one or both eyes. These refractive errors were categorized according to the Refractive Error Study in Children (RESC) Survey group.

The data were entered into the Excel sheet and analyzed using the Statistical Package for the Social Sciences version 16.0 (SPSS Inc, Chicago, IL, USA). The data were expressed as proportions (*n*, %).

Results:

Table 1: Age distribution of refractive error in primary school children

Age group (years)	Total no. of students	Refractive error	%
6‑9	470	23	4.9
10‑13	322	38	11.8
14‑17	210	63	30.0
Total	1002	124	12.4

A total of 1002 school children were screened from 5 different schools of Bihar. Refractive error was highly prevalent in the age group of 14–17 years (*n* = 63) followed (*n* = 38) in the age group 10–13 years. However, the age group between 6 and 9 years had comparatively less prevalent refractive errors with 4.9% (*n* = 23). [Table 1].

Table 2: Gender distribution of refractive errors in the primary school

Gender	No. of students examined	Refractive error	Refractive error (%)
Male	320	36	11.25
Female	682	88	12.9
Total	1002	124	12.4

Regarding gender, out of 320 males, 11.25% (n=36) had refractive errors whereas 12.9% (n=88) females [Table 2].

Table 3: Refractive error based on myopia, hyperopia, and astigmatism among the school children

No. of students (%)	Myopia (%)	Astigmatism	Hypermetropia (%)
124 (12.4)	59(47.5)	37 (29.8)	28(22.5)

From a total of 1002 students studying in different schools, the prevalence of refractive errors was 12.4% (*n* = 124) among which myopia was the most common with 47.58% (*n* = 59), followed by 29.8% (n = 37) with astigmatism and the remaining 22.5% of hyperopia (*n* = 28), [Table 3].

Discussion:

Poor vision in childhood affects performance in school or at work and has a negative influence on the future life of a child. Moreover, planning of the youth's career has a strong relation with visual acuity. Refractive errors are the most common reasons for a visit to an ophthalmic surgeon or an ophthalmic assistant. [9]

In Sapkota (2008), 12 the prevalence of vision impairment was reported in 0.86 % had best corrected visual acuity less than 6/ 12 in both eyes. [10]

Parmar A. et al. [11] reported significantly higher prevalence in older children than younger one. Study by Pavithra et al. in Bangalore [12], Vidusha KSS et al. VidushaKSS et al. [13] where refractive error increased significantly with increased in age. In Saad et al.study prevalence of refractive error was significantly higher among subjects aged >12 years. [14]

The overall prevalence of refractive errors in the study was 6.7% which is in consort with the study reported by Warad C et al. [15] in Karnataka (6.4%). However, a few studies have reported a higher prevalence and this could be due to multiple factors like population size, geographical locations, and race leading to various disparities. [16]

Observation made by Rose et al. [17] and Khan A N et al. [18] concluded in their study that higher levels of total time spent outdoors, rather than sport per se, was associated with lesser incidence of myopia.

myopia was the most common with 47.58% (n = 59) followed by astigmatism with 29.8% (n = 37) with and followed by 22.5% of hyperopia (n = 28) and many studies have reported similar results. [19, 20]

Conclusion:

The study gives relevant and baseline information on refractive error in Bihar schoolchildren. To acquire a fuller picture of refractive error and other eye-related disorders, broader research should be done in all of the state's schools to uncover vision problems as early as feasible.

References:

1. Dandona R, Dandona L. Ref ract ive error blindness. Bull World Health Organ. 2001;79: 237-243.
2. Negrel AD, Maul E, Pokharel GP, Zhao J, Ellwein LB. Ref ract ive error study in children: sampling and measurement methods for a mult icount ry survey. Am J Ophthalmol. 2000;129:421-426
3. Desai S, Desai R, Desai N C, Lohiya S. School eye health appraisal. Indian Journal of Opthalmology 1989; 37 (4):173-175.
4. Sharma S, Bashisth BM, Kalhan M, Goel M. Ocular infection in school children in a rural block of Haryana. The Internet Journal of Epidem iology 2009; 6 (2).DOI number: 10.55 80/1b57.
5. Kumar S, Srivastava D, JaiswalKirti. Undetected Ocular Morbidity-A cause of performance anxiety among school children. Indian Journal of Public Health Research & Development 2010; 1 (2): 39-40.
6. Reichman NE, Corman H, Noonan K. Impact of child disability on the family. Matern Child Health J 2008;12:679-83.
7. Bourne RR, Dineen BP, Huq DM, Ali SM, Johnson GJ. Correction of refractive error in the adult population of Bangladesh: Meeting the unmet need. Invest Ophthalmol Vis Sci 20 04;45:410-7.
8. Singh S, Singh H, Joshi VS. Eye diseases among primary school children. Indian J Ophthalmol 1974;22:1-3.
9. Gupta M, Gupta BP, Cauhan A, Bhardwaj A. Ocular morbidity prevalence among school children in Shimla. Indian J Ophthalmol. 2009; 57:133-8.
10. Sapkota YD, Adhikari BN, Pokharel GP, Poudyal BK, Ellwein LB. The prevalence of visual impairment in school chi ldren of upper-middle socioeconomic status in Kathamndu. Ophthalmic Epidemiol. 2008;15:17-23.
11. Singh V, Malik K P S, Malik V K, Jain Kirti, Indian Journal of Ophthalmology Volume 65 Issue 6: 500-508.
12. Pavithra M, Maheshwaran R, Rani M. A study on the prevalence of refractive errors among school children of 7-15 years age group in the field practice areas of a medical college in Bangalore. Int J Med Sci Public Health. 2013; 2(3):619.
13. Vidusha KSS, Damayanthi M. N. Prevalence of refractive errors among school children in the rural field practice area of a tertiary care hospital, Bengaluru Int J Community Med Public Health. 2018 Apr;5(4):1471-1476.
14. Saad A, El-Bayoumy B. Environmental risk factors for refractive error among Egyptian school children. Eastern Mediterranean Health J. 2007;13(4):819-27.
15. Warad C, Suranagi PV, Poornima MS, Nagveni. Refractive errors among school children in and around Davangere. J Pub Health Med Res 2014;2:28-31.
16. Shakee T, Mitta KS. Pattern of refractive errors in primary school children in Dehradun city of Uttrakhand State. Delhi Journal of Ophthalmology 2016;27:106-10.
17. Rose KA, Morgan IG, Ip J, Kifley A, Huynh S Et Al. Outdoor activity reduces the prevalence of myopia in children. Ophthalmol; 2008 ;115: 1279–1285
18. Khan A N et al, Khan A H, Memon J I. Incidence of Myopia in Relation to Close Work

at Indus Medical College Hospital, Tando Mohammad Khan. JOJ Ophthal 2(2): JOJO.MS.ID.555583 (2017).
19. Rai SK, Thapa HB, Gurung N, Bhari AM, Sharma MK. Pattern of refractive error in primary school children in Rupandehi district, Nepal. J Univers Coll Med Sci 2015;31:31-6.
20. Panda L, Nayak S, Rohit CK, Das T. Tribal Odisha eye disease study (TOES)#7. Prevalence of refractive error in children in tribal Odisha (India) school screening. Indian J Ophthalmol 2020;68:1596-9.