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Prevalence of refractive errors in school going children in tribal belt of India

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Abstract
Aim: to study the prevalence and types of refractive errors in children of school going age-group (6-18 years) in the tribal belt of Jharkhand and hence prevent visual impairment by proper intervention.
Materials and Methods: This observational hospital based study was performed in Ophthalmology department of RIO, RIMS Ranchi between July 2018 to June 2019. Tribal children of school going age-group (6-18 years), who visited eye OPD with complains of diminution of vision were thoroughly evaluated. The study parameters were visual acuity (V_A) and ocular examination. V_A was measured with the Snellen E/ alphabet chart while students with subnormal vision were examined using pinhole, retinoscopy and subjective refraction. Data was analysed using SPSS software and all differences associated with chance probability of ≤0.05 was considered statistically significant.
Results: Total 937 children were included in the study out of which 511 children had refractive errors (54.54%). Out of 511 children, there were 357 males and 154 females (sex ratio- 2.31:1).Of these 511 children with refractive errors, 252 children had visual acuity <20/40 (49.31%). Most of the children with refractive errors belonged to age group 16-18 years (38.94%) followed by age group 14-16 years (20.16%). Among refractive errors, myopia was found to be most common.
Conclusion: Refractive errors among school going children is a common problem and needs to be assessed regularly for early intervention.

Keywords: refractive errors, school going children, tribal population, myopia, hypermetropia

Introduction
Refractive errors are one of the most common causes of visual impairment around the world and the second leading cause of treatable blindness [1]. The result of refractive errors is blurred vision, which is sometimes so severe that it causes visual impairment [2].Visual impairment due to refractive errors is defined as visual acuity less than 6/18 in the better eye.
Children in school going age group (6-16 years) represent 25% of population in developing countries and fall in preventable age group for correction of refractive errors [4]. An estimated 19 million children are visually impaired and of these, 12 million are visually impaired due to refractive errors [3]. The presence of refractive errors in school going children affects their physical, mental and behavioral development as well. [5]
Children do not complain of defective vision, and may not even be aware of their problem. This warrants early detection and treatment to prevent permanent disability. [6] School eye screening programme was initiated by National programme for control of blindness in 1994. Vision 2020-the right to sight is a global initiative launched by WHO in 1999 to eliminate avoidable blindness like cataract, xerophthalmia, refractive errors, trachoma and other causes of childhood blindness by 2020. [7] Considering the fact that 30% of India's blind lose their sight before the age of 20years, the early detection of ocular morbidity in young children is obvious.

Aims and Objectives
The purpose of this study was to study the prevalence and types of refractive errors in children of school going age-group (6-18 years) in the tribal belt of Jharkhand and hence prevent visual impairment in them by proper intervention.

Materials and Methods
This observational hospital based study was performed in the Ophthalmology department of RIO, RIMS Ranchi between July 2018 to June 2019, after taking proper approval from the Institutional Ethics Committee.
Tribal children of school going age-group (6-18 years), who visited eye OPD of RIO, RIMS Ranchi between July 2018 to June 2019 with complains of diminution of vision were thoroughly evaluated.

Inclusion criteria were
- Tribal children of age group 6-18 years
- Visual acuity poorer than 6/6

- Those who gave consent for the study

Exclusion criteria were
- Media opacities (corneal opacity, cataract, vitreous haemorrhageetc)
- Retinal disorders
- Previous intraocular surgery

Total 937 children of age group 6-18 years were enrolled in the study. The study parameters were visual acuity (V_A) evaluation and ocular examination. V_A was measured with the Snellen E/ alphabet chart while students with subnormal vision were examined using pinhole, retinoscopy evaluation and subjective refraction.
Data was analysed using SPSS software (Statistical Package for Social Sciences, SPSS version 22.0; SPSS Inc., Chicago, IL, USA). All differences associated with chance probability of ≤0.05 was considered statistically significant.

Results
Total 937 children were included in the study out of which 511 children had refractive errors (54.54%). Out of 511 children, there were 357 males and 154 females (sex ratio- 2.31:1).Of these 511 children with refractive errors, 252 children had visual acuity <20/40 (49.31%). Proportion of Children with Refractive Error Is Given In Figure 1

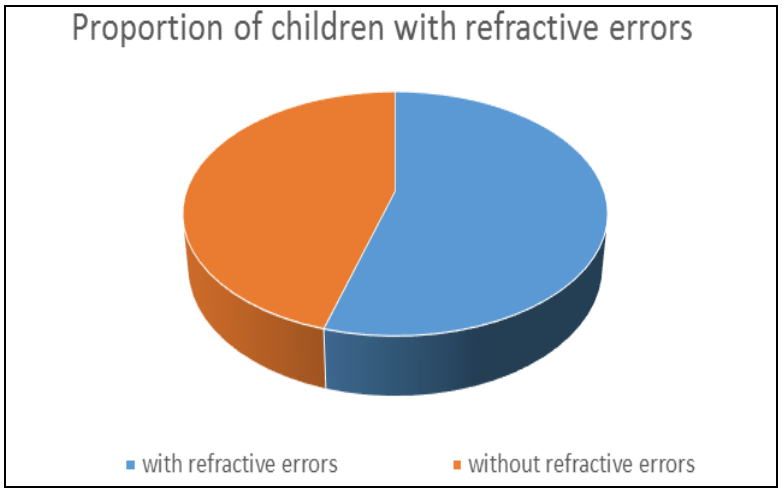

Fig 1: Age Wise Distribution of Patients with Refractive Errors Is Given In Table 1

Table 1: Types, Age and Sex Distributed Proportion of Patients with Refractive Errors Is Given In Figure 2

Sl.no.	Age group	No. of patients
01	6-8 years	33 (6.46%)
02	8-10 years	41 (8.02%)
03	10-12 years	66 (12.92%)
04	12-14 years	69 (13.50%)
05	14-16 years	103 (20.16%)
06	16-18 years	199 (38.94%)

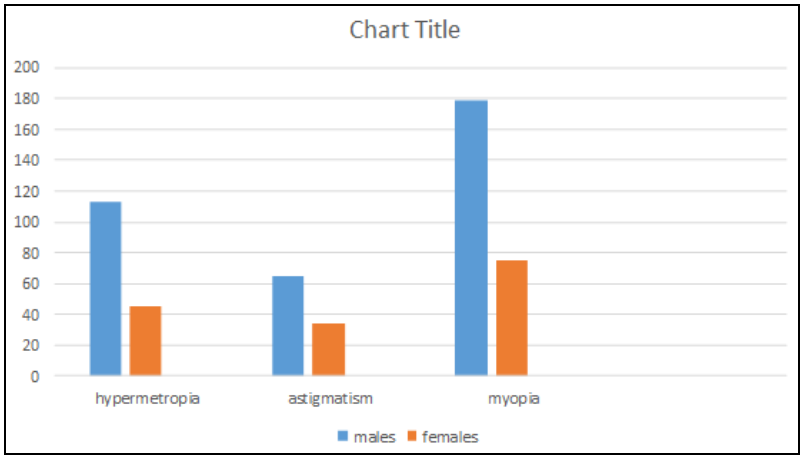

Fig 2

Most of the children with refractive errors belonged to age group 16-18 years (38.94%) followed by age group 14-16 years (20.16%). Among 511 children, maximum were males (69.86%). Among the refractive errors, myopia was found to be most common, both among males (50.14%) as well as females (48.70%), followed by hypermetropia. Out of 511, 252 children had visual acuity <20/40 (49.31%).

Discussion

This study showed that among 937 children in school going age group, 511 children had refractive errors, which is quite a higher percentage (54.54%). This is in contrast to a study published by *Jayanth et al* (10.12%) [8] and *Vidusha K S et al* (10.50%) [9].

In our study, males had a higher prevalence of refractive errors (69.86%) than females (30.14%). This may be due to the reason that in the tribal belts of the state, very few females went to schools as compared to males and females were mostly involved in household chores so, refractive errors in them remained unnoticed and thus very few number of them turned to hospitals for eye-checkup.

Among different age groups, maximum children with refractive errors were found in higher age groups- 16-18years followed by 14-16 years. This was found to be consistent with the studies performed by *Pavithra et al* [10], *Vidusha K S et al* [9], *Saad et al* [11] which showed that refractive error increased significantly with increased in age. This was perhaps because children of higher classes spent most of the time in near work, studies and indoors. Among the refractive errors, myopia showed the highest prevalence both in males (50.14%) and females (48.70%), which was consistent with the studies published by*Vidusha K S et al* [9], *Assefa WY et al* [12], *Pavithra et al*[10], *Ore et al* [6].This was because myopia is more common in younger ages and significant number of children improve with age. Our study has several limitations. We only collected data from those children who came to OPD for eye check-up and thus missed out many cases, who actually have refractive errors but fail to come to hospital due to lack of awareness, social, economic and many other factors. Also, we failed to follow up many patients after prescribing spectacles.

Conclusion

Refractive errors among children is a common problem and needs to be assessed regularly for early intervention. The present study indicates that the school age represents high risk group for refractive errors and screening of the children for vision at the time of school admission and periodical eye examination of the children is recommended for early rectification of impaired vision.

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