Original Article

Ophthalmology and Allied Sciences
Volume 5 Number 1, January - April 2019
DOI: http://dx.doi.org/10.21088/oas.2454.7816.5119.18

Prevalence of Ocular Morbidity in School Going Children in Solapur District of Maharashtra

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Abstract

Background: Majority (80%) of all visual impairment globally is considered to be avoidable or reversible if identified early in life. Children are the most venerable group as they do not identify / notify the early signs of visual impairment.

Aims and Objective: To estimate prevalence of ocular morbidity in School going children in Solapur district of Maharashtra.

Methods: This cross-sectional study was conducted in 10 selected schools, 4 urban and 6 rural schools. Detailed ophthalmic examination was done by an ophthalmologist. A total of 3212 school going children, 1664 boys and 1578 girls, were examined between August 2017 and February 2018.

Results: A total of 436 children with different ocular morbidities were detected in the study, revealing the prevalence of ocular morbidity equal to 13.57%. The overall prevalence of ocular morbidity in boys and girls was 14.18 % and 12.92%. The overall prevalence of ocular morbidity was not significantly different in boys and girls ($Z = 1.05$, $p=0.30$). The most common ocular morbidity was refractive errors (8.75%), followed by miscellaneous conditions which included infectious or allergic conditions like conjunctivitis, blepharities etc.

Conclusion: The study has concluded that the overall prevalence of ocular morbidity was 13.57%. The prevalence of refractive errors was significantly more in urban children than in rural children. Similarly refractive errors were significantly more in older children (> 11) years than in children below the age of 11 years.

Keywords: Ocular Morbidity; Prevalence; School Going Children; Refractive Errors.

How to cite this article:
Pratyush R. Kabra, Harish B. Raichur, Madhuri S. Kalyani et al. Prevalence of Ocular Morbidity in School Going Children in Solapur District of Maharashtra. Ophthalmol Allied Sci. 2019;5(1):102-106.

Introduction

Approximately 1.3 billion people, estimated globally, are living with some form of vision impairment, cataract, glaucoma, corneal opacity trachoma and macular degeneration. The reasons of vision impairment vary considerably across countries among children. With effective available intervention majority (80%) of all visual impairment globally are considered to be avoidable or reversible if identified early in life. Over the years, WHO has developed and implemented various tools to assess the presence of ocular morbidity and provision of eye care services in the country [1].

In India it is predicted that around 62.6 million people were having visual impairment in the year 2010 and this number is rising significantly and is likely to reach 139 million by 2020 [2,3].

Visual Impairment in children and the young

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Received on 22.02.2019, **Accepted on** 07.03.2019

has a lot of social and economical implications in the future. Children in schools are affected by vision problems such as refractive errors, vitamin A deficiency, squint and eye infections. The fact that 30% of Indian blindness has lost vision before the age of 20 years, the importance of early detection and treatment of ocular morbidity and visual impairment in young children is obvious [4]. Children are unaware of the symptoms and complications of the impaired vision or are scare of being teased form their friends hence they may not complain of defective vision and try to adjust by sitting in the front, holding the book close to the eyes, squeezing the eyes.

The earliest signs of refractive errors are strainful eyes with or without reddening in the evening, with watering and headache. The complaints of these children to the parents were unnoticed due to lack of awareness in the rural areas [5].

School children form a stable population, easily accessible and school is the best place to provide health education to the children and intern the community. Early identification and proper guidance on visual impairment will help these children in a long way to prevent the preventable causes of blindness. Hence the present study was undertaken in the school children to assess the prevalence of ocular morbidity.

Materials and methods

Type of study: Cross sectional.

Study setting: Ten selected schools in Solapur district, 4 urban and 6 rural.

Study period: August 2017 to February 2018.

This cross-sectional study was conducted by the department of Ophthalmology and Community Medicine of Ashwini Rural Medical College Hospital and Research Centre, Solapur. Ten schools were selected by purposive sampling, due to operational feasibility, for this study. A team of Ophthalmologists, Community Medicine teacher, Ophthalmic technicians, data entry operators etc visited every selected schools after obtaining due permission from the school authorities. The entire school going children from kinder garden to tenth class, present in the school were examined for any of the ocular morbidity. Multiple visits were paid to the schools to examine most of the children from each school. A pre-defined proforma was used to record the data of each child. If child was having any of the ocular morbidity, then the child was treated on the spot or he was referred to medical college hospital for further management. Data was analyzed using excel. Chi square test was wherever necessary.

Results

A total of 10 selected schools were included in the study. Out of that 6 were from rural area and 4 were from urban area. Operational feasibility was the purpose for selecting these schools. Table 1 shows the age and gender wise distribution of study population. There were 1664 boys and 1578 girls included in the study. Maximum number of children was in the age group of 11-13 years, 616 (19.18%), followed by the age group of 13-15 years, 567 (17.65%). A total of 1664 boys and 1548 girls were included in the study. Then mean of boys was 10.91 ± 3.39 and for girls 10.89 ± 3.37. There was no significant difference in the mean ages of boys and girls. ($Z = 0.17$, $p = 0.86$).

Table 1: Age and gender wise distribution of study population

Sr	Age	Boys	Percentage	Girls	Percentage	Total	
1	5-7	289	17.37	265	17.12	554	17.25
2	7-9	268	16.11	248	16.02	516	16.06
3	9-11	265	15.93	249	16.09	514	16.00
4	11-13	315	18.93	301	19.44	616	19.18
5	13-15	292	17.55	275	17.76	567	17.65
6	> 15	235	14.12	210	13.57	445	13.85
	Total	1664	100.00	1548	100.00	3212	100.00

Table 2: Urban – rural wise distribution of study population

Sr	Location of school	Boys	Percentage	Girls	Percentage	Total
1	Rural	851	52.08	783	47.92	1634
2	Urban	813	51.52	765	48.48	1578
		1664	51.81	1548	48.19	3212

A total of 1634 children in 6 rural schools and 1578 children in 4 urban schools were examined in this study. Table 2 shows the location wise distribution of examined school going children.

Table 3 shows the prevalence of different ocular morbidities in the study population. A total of 436 children with different ocular morbidities were detected in the study, revealing the prevalence of ocular morbidity equal to 13.57%. The overall prevalence of ocular morbidity in boys and girls was 14.18% and 12.92%. The overall prevalence of ocular morbidity was not significantly different in boys and girls (Z = 1.05, p=0.30). Similarly, there was no significant difference in the prevalence of any of the ocular morbidity in boys and girls.

comparatively less ranging from 0.06 % to 1.12%.

Table 4 shows school location wise prevalence of ocular morbidities. The study has observed that the prevalence of refractive errors in urban schools was significantly more than that in rural schools (p=0.02). There was no significant difference in the rest of the morbidities in urban and rural areas.

Table 5 shows the prevalence of ocular morbidities in the age group of ≤ 11 years and > 11 years. The prevalence of refractive errors was significantly more in older children (p=0.0001). The prevalence of developmental cataract was significantly more in the age group of ≤ 11 years than that in the age group of > 11 years (p = 0.0386). Similarly prevalence of convergence inefficiency

Table 3: Gender wise Prevalence of ocular morbidity in the study population

Sr	Ocular condition	Boys (N=1664)		Girls (N=1548)		Total (N=3212)		Chi square	p value
		Affected	Prevalence in%	Affected	Prevalence in%	Affected	Prevalence in%		
1	Refractive error	156	9.38	125	8.07	281	8.75	1.70	0.19
2	Vitamin A deficiency	5	0.30	4	0.26	9	0.28	0.05	0.82
3	Strabismus	1	0.06	1	0.06	2	0.06	0.00	0.96
4	Corneal opacity	2	0.12	3	0.19	5	0.16	0.28	0.60
5	Developmental cataract	7	0.42	4	0.26	11	0.34	0.62	0.43
6	Convergence inefficiency	21	1.26	15	0.97	36	1.12	0.62	0.43
7	Squint with amblyopia	11	0.66	12	0.78	23	0.72	0.15	0.70
8	Squint without Amblyopia	2	0.12	1	0.06	3	0.09	0.27	0.61
9	Miscellaneous	31	1.86	35	2.26	66	2.05	0.63	0.43

Table 4: Location wise prevalence of ocular morbidity

Sr	Ocular condition	Rural (N=1634)		Urban (N=1578)		Total (N=3212)		Chi square	p value
		Affected	Prevalence in%	Affected	Prevalence in%	Affected	Prevalence in%		
1	Refractive error	124	7.59	157	9.95	281	8.75	5.60	0.02
2	Vitamin A deficiency	6	0.37	3	0.19	9	0.28	0.80	0.37
3	Strabismus	1	0.06	1	0.06	2	0.06	0.00	0.96
4	Corneal opacity	1	0.06	4	0.25	5	0.16	2.03	0.15
5	Developmental cataract	5	0.31	6	0.38	11	0.34	0.18	0.67
6	Convergence inefficiency	17	1.04	19	1.20	36	1.12	0.31	0.58
7	Squint with amblyopia	13	0.80	10	0.63	23	0.72	0.21	0.65
8	Squint without Amblyopia	1	0.06	2	0.13	3	0.09	0.41	0.52
9	Miscellaneous	27	1.65	39	2.47	66	2.05	3.20	0.07

The most common ocular morbidity was refractive errors (8.75 %), followed by miscellaneous conditions which included infectious or allergic conditions like conjunctivitis, blepharities etc. Prevalence of rest of the morbidities was

was significantly more in in the age group of ≤ 11 years than that in the age group of > 11 years (p =0.0002). Prevalence of any of the other ocular morbidity was not significantly different in these two age groups.

Table 5: Age wise prevalence of ocular morbidity

Sr	Ocular condition	Age ≤ 11 (N=1584)		Age > 11 (N=1628)		Total (N=3212)		Chi square	p value
		Affected	Prevalence in%	Affected	Prevalence in%	Affected	Prevalence in%		
1	Refractive error	112	7.07	169	10.38	281	8.75	14.44	0.0001
2	Vitamin A deficiency	7	0.44	2	0.12	9	0.28	2.65	0.1035
3	Strabismus	0	0.00	2	0.12	2	0.06	2.06	0.1515
4	Corneal opacity	2	0.13	3	0.18	5	0.16	0.23	0.6325
5	Developmental cataract	9	0.57	2	0.12	11	0.34	4.28	0.0386
6	Convergence inefficiency	7	0.44	29	1.78	36	1.12	14.22	0.0002
7	Squint with amblyopia	11	0.69	12	0.74	23	0.72	0.08	0.7831
8	Squint without Amblyopia	2	0.13	1	0.06	3	0.09	0.31	0.5796
9	Miscellaneous	35	2.21	31	1.90	66	2.05	0.15	0.7002

Discussion

This cross-sectional study was planned in 10 schools, 4 urban and 6 rural, to estimate the prevalence of ocular morbidities in school going children. The study has observed that the overall prevalence of ocular morbidity was 13.57%.

Nepal et al. have reported a comparable prevalence of 11% in a study conducted at Kathmandu [6]. Prajapati et al. have reported a 13% prevalence in a study conducted in Gandhinagar [4]. Another study conducted by Nirmalan et al., the Kariapatti pediatric eye evaluation project, has reported a prevalence of 13.6% [7]. All these results were comparable with our study.

A study conducted by Kumar et al. has reported the prevalence of ocular morbidity as 22.7% [8]. A study conducted by Veer Singh et al. has reported the prevalence as 28.34% in western Uttar Pradesh [9]. Another study conducted by Gupta et al. in shimla has reported the prevalence equal to 31.6% [10]. Meriton Stanly A et al. has reported the prevalence equal to 22.3% [11]. Another study conducted by Chaturvedi and Aggarwal has reported it as 40% [12]. These studies have reported a higher prevalence than reported by this study. The difference may be due to different socio-demographic characteristics of the study population, seasonal variations in the ocular conditions etc.

The present study has reported that there was no significant gender wise difference in the ocular morbidities. The finding were comparable with the findings of Gupta et al. [10], who reported marginal difference in the prevalence of ocular diseases among males and females (32.5 and 30.6%) and Sehgal et al. (males 46.1% and females 48.3%) [13].

However, a study conducted by Khurana et al. has reported significantly higher prevalence of ocular morbidities in females (73.5%) as compared to males (49.4%) in Haryana [14]. In that study, higher prevalence of infectious diseases like trachoma, conjunctivitis amongst females was attributable to increased use of common ocular cosmetic material.

Conclusion

The present study has revealed that the prevalence of different ocular morbidities was 13.57%. The most common ocular morbidity was refractive errors followed by miscellaneous infectious and allergic conditions like conjunctivitis, blepharities etc. There was no significant difference in the ocular morbidity amongst boys and girls. However, refractive errors were significantly more in urban children than in rural children. Similarly refractive errors were significantly more in older children (> 11) years than in children below the age of 11 years.

Prior publication: Nil

Support: Nil

Conflicts of interest: Nil

Permissions: Nil

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