Clinical profile of childhood blindness in a tertiary eye care centre in central India

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Abstract

Objectives: To determine institution based incidence of childhood blindness and to study its clinical profile.
Type of Study: An observational retrospective, institution based study.
Materials and Methods: This study was conducted in a tertiary centre in central India from July 2014 to September 2016. Children who met the inclusion criteria were enrolled in the study. They were thoroughly examined in each of details. Data was entered in a prescribed format and was analyzed to know the clinical profile of childhood blindness.
Results: A total of 44064 patients were examined in the study. 47 cases met the inclusion criteria. Institutional prevalence was 1.06 /1000 population and incidence was 0.34/1000 population. Maximum cases of blindness belong to 0-5 year's age and was more in females as compared to males. Corneal pathologies were leading cause of childhood blindness followed by trauma and congenital globe anomalies. Keratomalacia was a major cause of preventable childhood blindness.
Conclusion: Childhood blindness is an important problem in the community. It should be dealt with proper planning. High percentage of childhood blindness is either preventable or treatable, so early detection and treatment is necessary.

Keywords: Childhood blindness, Visual acuity, Keratomalacia, Corneal blindness.

Introduction

Amongst all the senses, eyes have the prime importance in our life.

According to WHO, blindness is visual acuity worse than 3/60 with best correction in better eye[1] Childhood blindness is a devastating physical condition and has a deep emotional and economic impact. It is an important cause of blindness worldwide.[2] It refers diseases and conditions occurring in less than 16 years of age, if left untreated, leads to severe visual impairment that are not likely to be treatable later in life.[3] World Health Organization's (WHO) "Vision 2020: the right to sight" was launched in 1999. Its main aim is to eliminate avoidable blindness worldwide by the year 2020.[4]

Approximately 1.4 million children are suffering from blindness worldwide. Out of which 75% live in Africa and Asia.[5]

Blindness in children does not show any coherence across regions. Socioeconomic development, availability of eye care services and primary health care are some of the major factors determining this issue.[5]

In high-income countries, optic nerve and higher visual pathway lesion are important cause of blindness.[5] Whereas uncorrected refractive error, keratomalacia due to malnutrition and poor immunization, congenital cataract and glaucoma, ophthalmia neonatorum and other ocular infection, trauma, consanguineous marriage leading to increase in congenital abnormalities, are the major causes in low-income countries.[5] In middle-income countries an increases in cases of Retinopathy of prematurity is observed

Materials and Methods

A retrospective, observational study was carried out on children less than 16 years of age who attended eye OPD and eye ward of the department of ophthalmology at Gandhi medical college Bhopal from July 2014 to September 2016.

Children below16 years with vision less than 3/60 in their better eye were enrolled. Personal details like age, sex and address were noted down. Detailed family, ocular and system history was noted down. Visual acuity was tested on snellens chart and refraction was done. Anterior segment was thoroughly examined with the help of slit lamp. Posterior segment was evaluated with the help of indirect ophthalmoscope, and if not visualized B scan was done. All the data entries were done in the prescribed format in uniform manner, and were analyzed to know the clinical profile.

Inclusion Criteria: All children under 16 years of age, attending eye OPD at the department of ophthalmology Gandhi Medical College Bhopal. With best corrected visual acuity less than 3/60

Exclusion Criteria

1 All patients above 16 years of age.
2 Lost Patients after first follow up.
3 Patients who had best corrected visual acuity >3/60 in better eye.

Result

Present study included 47 cases of childhood blindness out of which 22 were males and 25 were females. Total no. of OPD patients during the study period were 44064

$$\text{Prevalence} = \frac{\text{Total number of cases}\,(\text{new} + \text{old})\,\text{x}\,1000}{\text{Population at risk}}$$

Institutional prevalence = 47/ 44064× 1000 = 1.06 per thousand patients attending the OPD in our institute.

Z score when calculated for prevalence comes out to be 0.61. The prevalence calculated in our study is not significant as overall prevalence of childhood blindness in India 0.8.

$$\text{Incidence} = \frac{\text{Total no of new cases detected in one year x 1000}}{\text{Population at risk during the same year}}$$

Newly detected cases of childhood blindness in the year 2015= 8

Total no of OPD patients attending department of ophthalmology in the year (2015) = 23005

Incidence of 2015= 8/23005 * 1000= 0.34 per 1000 patients attending the ophthalmology OPD in our institute.

Maximum number of blind children belonged to age group <5 yr (40.43%). As the age increased number of blind children decreased.

Table 1: Age-wise distribution of cases with childhood blindness (n= 47)

Age group(years)	No. of cases	Percentage
0-5	19	40.43%
5-10	14	29.79%
10-15	12	25.53%
>15	2	4.25%
Grand Total	47	100%

In the present study 53.2% blind children were female (25) and 46.80% (22) were male

Table 2: Gender-wise distribution of cases with childhood blindness

Gender	No. of cases	Percentage
Male	22	46.80%
Female	25	53.20%
Grand Total	47	100%

Table 3: Clinical presentation of childhood blindness (n=47)

	N=47	Percentage
Corneal Pathologies	15	31.91%
Congenital globe anomalies	11	23.40%
Congenital /developmental Cataract	6	12.77%
Congenital Glaucoma	1	2.13%
Optic nerve diseases	3	6.38%
Retinal dystrophy	3	6.38%
Retinoblastoma	1	2.13%
Trauma	7	14.89%
Total	47	100%

Diseases of cornea leading to childhood blindness was seen in 31.91% (n=15) patient.

Development anomalies of eye causing blindness was seen in 23.4% (n= 11) patient.

Trauma leading to childhood blindness was seen in each 14.9% (n=7).

Congenital /developmental cataract was present in 12.77% (n=6) patient.

Optic nerve disorder and retinal dystrophy was seen in 6.38% (n=3) patient each.

Rare cause of childhood blindness was congenital glaucoma and retinoblastoma, seen in 2.13% (n=1) patient each.

Table 4: Corneal pathologies responsible for childhood blindness

Corneal pathologies	No. of cases	Percentage
Keratomalacia	7	46.66%
Healed keratitis	3	20.00%
Anterior staphyloma	3	20.00%
Stevens Johnson syndrome	1	6.67%
Ophthalmia neonatorum	1	6.67%
Total	15	100%

Amongst 15 patient of corneal cause of childhood blindness keratomalacia, 46.66% (n=7) was the leading cause. Followed by healed keratitis and anterior staphyloma. 20% each (n=3). Steven Johnson and ophthalmia neonatarum 6.67% (n=1) each were rare cause of corneal blindness.

Table 5: Distribution of cases with preventable and treatable causes of childhood blindness (n=25)

Preventable and treatable causes of childhood blindness	Number of cases	Percentage
Keratomalacia	7	28%
Ophthalmia neonatorum	1	4%
Congenital cataract	6	24%
Congenital glaucoma	1	4%
Optic atrophy secondary to infection	3	12%
Trauma	7	28%

In the present study 25(53.1%) cases were due to preventable and treatable cause.

Preventable causes included keratomalacia 7(28%), trauma 7(28%), optic atrophy due to secondary infection 3(12%) and ophthalmia neonatarum 1(4%).

Treatable causes included congenital cataract 6 (24%) and congenital glaucoma 1 (4%).

Discussion

It's difficult to estimate accurate prevalence and incidence as very large sample is required.[7] In present study 47 cases fell under our criteria and prevalence of blindness in children was 1.06 per thousand populations. Prevalence ranges from 0.3/1000 children in well-developed communities to 1.5/1000 in poorest communities.[8] As per survey in 2006-07 by NPCB (National Programme for Control of Blindness),[9] childhood blindness in India was 0.8/1000 children. Dorairaj SK et al in their study found prevalence of 1.06/1000 population.[10] Incidence in the year 2015 was 0.34/1000 patients in current study.

We found that as the age increased, cases of childhood blindness decreased. Maximum proportion (40.43%) belongs to 0-5 years. Reason for high proportion of blindness in this age group is because; congenital anomaly and keratomalacia are the two most common causes for blindness in the present study. Keratomalacia is common in children below 6 years. Steinkuller L et al found similar result in their study.[11]

In present study, out of 47 cases of childhood blindness, 53.20% were females and 46.80% were males. Female preponderance is probably due to delay in seeking treatment in cases of female child in family with low socioeconomic status. Similar observations were seen in the study conducted by S Misra et al.[12] However a study conducted by Sushank Ashok Bhalerao et al[13] in a blind school in Allahabad found male preponderance in their study.

In the present study corneal pathologies (31.91%) were the leading cause of blindness followed by congenital globe anomalies (23.40%), trauma (14.89%) and congenital cataract (12.77%).

Similar result was found by a study conducted by Harsha Bhattacharjee et al[14] and Hornby et al[15] however in a study conducted by Sushank Ashok Bhalerao et al[13] congenital globe anomaly was the major cause of blindness followed by corneal blindness.

Keratomalacia (46.66%) due to vitamin A deficiency was the leading cause of corneal blindness in this study which was similar to a study conducted by Harsha Bhattacharjee et al.[14] It was also the major preventable cause identified. It can be easily prevented by vitamin A supplementation. Corneal blindness can be benefitted by corneal transplantation. So efforts should be made to educate and improve awareness among people about eye donation so that these cases can be treated and the burden of blindness in the society can be reduced.

In the present study, overall 53.1% of children were blind from potentially preventable or treatable conditions. This large proportion of children if identified early and given proper treatment can reduce the load of childhood blindness.

Keratomalcia, ophthalmia neonatarum, trauma, and optic atrophy secondary to infection are the preventable cause of blindness. Educating parents, implementation of public health strategies, increased awareness regarding immunization, promotion of breastfeeding, and continued programs for the control of vitamin A deficiency can reduce the load of preventable blindness.

Treatable causes included congenital glaucoma and cataract. Training pediatrician in screening for early detection with appropriate referral to a tertiary care center can help in prompt treatment and prevent blindness.

Conclusion

Childhood blindness is an important problem in the community. It should be dealt with proper planning. Early detection and prompt treatment can reduce the load. In the study, prevalence was 1.06/1000 patients and incidence in year 2015 was 0.34 /1000 patients. Maximum patient belong to 0-5 age. Blindness was more common in female. Corneal pathologies were the major cause of blindness, amongst which keratomalacia was major preventable cause.

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How to cite this article: Kubrey S. S, Jareda J. Clinical profile of childhood blindness in a tertiary eye care centre in central India. Indian J Clin Exp Ophthalmol. 2018;4(4):503-506.