

Commentary: Childhood blindness in India: Regional variations

Recent estimates show that there are 19 million children who are visually impaired globally, of which 1.26 million children are blind.^[1,2] Although the absolute numbers are lesser, control of childhood blindness (CB) is one of the priorities of Vision 2020: The Right to Sight, and there are several reasons for this.^[3] First, the cause of blindness in children is very different from that in adults. Therefore, the strategy to combat blindness in adults will not necessarily help in the control of blindness in children. Second, unlike in adults, a delay in treatment can lead to amblyopia. Third, children's eyes are small and they respond differently to treatment. Thus, specific expertise, equipment, and training are required. Moreover, a blind child has many years of blindness ahead of him or her. Finally, blindness in children is a cause of mortality. Therefore, strategies to reduce CB are needed to be developed to alleviate the emotional, social, and economic cost to the child, his or her family, and the society and positively influence the child's future, in education, occupation, and social life.^[4]

Given the practical difficulties in undertaking epidemiological research on visual impairment in children, an understanding of the pattern and cause of blindness in children can be obtained by examination of children in school for the blind.^[5] Repeating the exercise at an interval of 5–10 years would be useful in detecting changes in trends for the cause of CB.^[5]

There are limited data on prevalence and causes of blindness in children from developing countries. The proportion of the various causes of CB varies region to region and the time frame, but estimates range from 0.4/1000 to 1/1000. In the past 20 years, there are a couple of studies done in schools for the blind in India;^[6–15] however, these are mostly from Southern India,^[8,10–13] and there are very few studies and limited data from other parts.^[6,7,9,15] Only one study was undertaken in nine states and 40% of the sample was from Southern India.^[14] Hence, this study is a useful addition to the

data of what is known from northern part of India.^[16] All these studies have shown a huge variation in causes over a period of time as well as between regions. Apart from this, there is variation in gender, with over-representation of males in these children cohort, especially from North India.^[6]

The studies from India have shown that overall, congenital globe anomalies have increased over the past two decades, and recent studies show that it contributes to nearly 40% of the causes of CB.^[6,7,9,10,12] There is a variation in retinal disease as the cause of blindness, and it is more common in the southern part of the country.^[8,10–13] Cataract as a cause of blindness varied from 7% to 14%. While corneal infections (due to measles, vitamin A deficiency, etc.) declined in the more affluent states (especially in South India),^[10,12,13] it continues to be a problem in north and north-east part of the country.^[6,7] One of the reasons for the decline in some of the states is good immunization coverage for measles and good nutritional programs run by the government.

Looking at the etiological causes, childhood disorders (mainly corneal infections) as a cause of blindness have declined in the southern part of the country but are still prevalent in north and north-east part of the country (especially in the rural pockets).^[6,7,10,12,13] Data also show that congenital anomalies and retinal causes are increasing in certain regions of the country.^[8,10–12] However, the etiology is still not known for a majority of causes. One of the possible reasons could be that in the absence of parents during school screening, proper history could not be elicited. Hence, in future, it would be helpful to examine/screen the parents of these children also so that a proper history could be elicited to determine the causes for blindness. Interacting with the parent would also give an opportunity for identifying the etiology as well as counseling them about the risks of consanguineous marriages.

These studies also show that about 30%–40% of the children suffer from easily preventable and treatable causes of blindness, mainly corneal diseases and lens-related disorders.^[6–15] The remaining were due to relatively unavoidable causes such as congenital anomalies and genetic diseases. However, due to regional variations in causes and differences between urban and rural areas, strategies should be customized to each region

rather than developing a generic strategy for the entire country. It is also found that 15%–25% of these children could benefit from low vision services. Hence, low vision and rehabilitation services should be an integral component of all the services provided in schools for the blind.

The findings from this study are similar to those seen in other studies done in north or north-eastern states.^[6,7,16] However, the striking feature is that there is quite an under-representation of female children, i.e., only 22.6% of female students in school, as well as 22.6% of children were not visually impaired. This low representation of female children indicates that the parents are either reluctant to send a female child who is blind to school or most of these female children do not survive. However, these are only speculations and it would be necessary to do a survey to identify the cause. Apart from this, unlike other schools for the blind, a huge percentage of normal children were studying in this school for the blind, again a reason worth exploring.

The studies from India have identified only a few rare cases of retinopathy of prematurity (ROP) in these schools for the blind. With this epidemic on the increase in ROP, there may be a rise in blindness from ROP in the future. As far as control of blindness in children is concerned, with the reduction in avoidable causes over a period of time, nonavoidable causes are gaining significance and controlling them will become a challenge. Research is required to identify the causes of whole globe involvement and hereditary retinal diseases. There is also a need for good genetic counseling, considering the complex social, economic, and cultural factors involved in these conditions.

There are some inherent biases in any study of children conducted in schools for the blind. Children with multiple disabilities, preschool aged children, those who have died, and children from the lower socioeconomic group and from rural communities are likely to be under-represented in schools for the blind, compared with population-based studies where these children are also covered. In addition, while the results from studies in schools for the blind give an understanding of the relative magnitude of different causes of blindness in a particular region, they do not give any information on cause-specific prevalence in the population. However, the advantage of blind school studies is that they are cheaper and quicker to perform and can be handled by a single observer.

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References

- Chandna A, Gilbert C. When your eye patient is a child. *Community Eye Health* 2010;23:1-3.
- Pascolini D, Mariotti SP. Global estimates of visual impairment: 2010. *Br J Ophthalmol* 2012;96:614-8.
- Muhit M, Gilbert C. A review of the epidemiology and control of childhood blindness. *Trop Doct* 2003;33:197-201.
- Gilbert C, Foster A. Childhood blindness in the context of VISION 2020 – The right to sight. *Bull World Health Organ* 2001;79:227-32.
- Gilbert CE, Anderton L, Dandona L, Foster A. Prevalence of visual impairment in children: A review of available data. *Ophthalmic Epidemiol* 1999;6:73-82.
- Bhalerao SA, Tandon M, Singh S, Dwivedi S, Kumar S, Rana J, *et al.* Visual impairment and blindness among the students of blind schools in Allahabad and its vicinity: A causal assessment. *Indian J Ophthalmol* 2015;63:254-8.
- Bhattacharjee H, Das K, Borah RR, Guha K, Gogate P, Purukayastha S, *et al.* Causes of childhood blindness in the Northeastern States of India. *Indian J Ophthalmol* 2008;56:495-9.
- Gilbert CE, Canovas R, Hagan M, Rao S, Foster A. Causes of childhood blindness: Results from West Africa, South India and Chile. *Eye (Lond)* 1993;7 (Pt 1):184-8.
- Gogate P, Deshpande M, Sudrik S, Taras S, Kishore H, Gilbert C, *et al.* Changing pattern of childhood blindness in Maharashtra, India. *Br J Ophthalmol* 2007;91:8-12.
- Gogate P, Kishore H, Dole K, Shetty J, Gilbert C, Ranade S, *et al.* The pattern of childhood blindness in Karnataka, South India. *Ophthalmic Epidemiol* 2009;16:212-7.
- Hornby SJ, Adolph S, Gothwal VK, Gilbert CE, Dandona L, Foster A, *et al.* Evaluation of children in six blind schools of Andhra Pradesh. *Indian J Ophthalmol* 2000;48:195-200.
- Krishnaiah S, Subba Rao B, Lakshmi Narasamma K, Amit G. A survey of severe visual impairment in children attending schools for the blind in a coastal district of Andhra Pradesh in South India. *Eye (Lond)* 2012;26:1065-70.
- Prakash MV, Sivakumar S, Dayal A, Chitra A, Subramaniam S. Ocular morbidity patterns among children in schools for the blind in Chennai. *Indian J Ophthalmol* 2017;65:733-7.
- Rahi JS, Sripathi S, Gilbert CE, Foster A. Childhood blindness in India: Causes in 1318 blind school students in nine states. *Eye (Lond)* 1995;9 (Pt 5):545-50.
- Titiyal JS, Pal N, Murthy GV, Gupta SK, Tandon R, Vajpayee RB, *et al.* Causes and temporal trends of blindness and severe visual impairment in children in schools for the blind in North India. *Br J Ophthalmol* 2003;87:941-5.
- Agarwal P, Maan V, Omaer M, Gupta K, Chauhan L, Khurana A. Clinical profile of childhood blindness and inappropriate enrolment of children in schools for visually impaired in Uttar Pradesh, India. *Indian J Ophthalmol* 2018;66:1456-61.

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