



Prevention of Blindness and Visual Impairment in Children through Innovative Strategies in India: An Experience from a Sankara Eye Foundation India

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Abstract

Purpose: To estimate the magnitude of childhood blindness in India and understand the innovative strategies to tackle this blindness.

Methods: One of an innovative program “Rainbow” was reviewed over a period of time and determined the magnitude of childhood blindness in India. The magnitude of the childhood blindness was extrapolated to the Indian population as per the Census 2011 estimates.

Results: The Rainbow program screened a total of 5,660,655 children of 29,216 schools/Anganwadis. Of these, a total of 84,468 (1.492%; 95% Confidence Intervals (CI): 1.482, 1.502) children were found to have refractive error problem for which the spectacles were distributed. The prevalence of childhood blindness was estimated to be 0.169% (95% CI: 0.166, 0.173).

Conclusions: If the prevalence estimate of 0.17% is extrapolated to the Indian children population, There would be 802,358 children would have been blind in India in the year 2011.

Keywords: Childhood blindness; School screening programs; Rainbow; India

Introduction

Every minute one child goes blind globally. It was estimated that there are 1.4 million blind children in the world, two thirds of whom live in the developing countries and causes vary as per the geographic distribution. Globally there are 153 million suffering from visual impairment, with 12.8 million children (5-15 years old) affected by uncorrected Refractive Error (RE) in both developed and developing world [1,2]. Therefore, uncorrected RE is a significant public health problem and needs a high priority in program design and implementation especially in the developing world including India. Though some children with uncorrected RE are asymptomatic, others occasionally complain headaches and inability to read the material on the chalkboard, which can have a serious impact on a child’s learning ability, academic performance, and personality. The major causes of blindness in children vary widely from region to region and largely driven by the socioeconomic condition of a household in any country along with the availability of the primary health care and eye care services. Childhood blindness is one of the priorities in Vision 2020: the right to sight programme. Various strategies are required that are region specific, based on various activities to prevent blindness in children in the community. Some of such precautionary measures are measles immunization, health education, and control of vitamin A deficiency and the provision of tertiary-level eye care facilities for conditions that require specialist management. In addition, conducting school eye screening programs are also a priority in the current situation in India especially preventing childhood avoidable blindness. The present report focused on the significant achievement of some of such programs in India recently in prevention of childhood blindness and visual impairment in India.

Materials and Methods

Sankara Eye Foundation India started its Paediatric Ophthalmology services with the noble aim of bringing back light into a child’s world. Over the years, the department has grown in leaps and bounds and has undertaken a host of initiatives to minimize long-term impact on lifestyles in children. Sankara Eye Foundation India has several childhood blindness prevention programs and one of such program is called “Rainbow”. The Rainbow program has started in the year 2002 in the South Indian state of Tamil Nadu, India. As part of this program, all the school children in

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all schools in the entire district of Coimbatore, Tamil Nadu will be screened by using a mobile van for various eye disorders for early diagnosis and appropriate treatment and action to prevent blindness and visual impairment in the school going children. As part of this, school teachers will be invited to participate in a day long training program, where they would be given hands on training on how to screen school children in their respective schools and identify the potential blinding eye disorders. All those trained teachers would go back to their respective schools and screen school children. Those children who were found abnormal by the school teacher will be again screened by trained optometrist to label those children finally as normal or abnormal. Those children who were found to be abnormal and need spectacles for their refractive error problem are provided spectacles at free of cost. The mobile van is equipped with latest sophisticated ophthalmic clinic and distribution of spectacles as part of refractive error correction. Children who need surgical intervention will be referred to the base hospital for an appropriate surgical treatment by a pediatric ophthalmologist.

Results

From the inception of the Rainbow program in the year 2002, a total of 22,207 school teachers were trained. These trained school teachers screened a total of 5,660,655 children of 29,216 schools/Anganwadis. Of these, a total of 84,468 (1.492%; 95% Confidence Intervals (CI): 1.482, 1.502) children were found to have refractive error problem for which the spectacles were distributed. A total of 9,592 (0.169%; 95% CI: 0.166, 0.173) children were operated for various ocular disorders.

Discussion

In order to estimate the childhood blindness, it is important to determine an appropriate sample size that accurately and precisely provide the prevalence and causes of childhood blindness. However, the prevalence of childhood blindness is very low; therefore, it is almost not possible to conduct a population-based epidemiological study with larger sample size to determine the prevalence and causes of childhood blindness in India. Hence, the majority of the population based data on childhood blindness is generally obtained from either surveys or blind schools in India to assess the prevalence and causes of childhood blindness. Earlier, Dandona et al. [3] have reported the prevalence and causes of childhood blindness in India from a population based study popularly known as APEDS [2]. Our prevalence estimates (0.17%) is exactly same as the prevalence estimate of childhood blindness reported from APEDS in India. As

per Census 2011 estimates, India's child population shares 39% of the total 1,210,193,422 which equals to 471,975,435. If the prevalence estimate of 0.17% is extrapolated to the total Indian child population, there would an estimated 802,358 children would have been blind in India. Refractive error which can be easily treatable with spectacles was responsible for 1.5% of the children suffering from it. Our extrapolated estimate of 802,358 children blind in India is quite a bit increased from 680,000 children reported to be blindness from APEDS in the year 2003. These blind children obviously have to live longer with disability and hence from an eye care service delivery and planning perspective, an appropriate action is required to prevent the childhood blindness so that the majority of the childhood years suffering can be avoided. In developing countries that include India is home for a high proportion of blindness in children which is due to preventable conditions acquired during childhood. Many of the causes of corneal scarring can be prevented in children if essential elements of primary eye health care are in place. Some of those measures can be implemented that include health education, healthy nutrition, pure water intake and supply and treatment of common conditions. These can act as preventive measures to tackle the childhood blindness in India. Genetic causes are also responsible for atleast 25% of all causes of childhood blindness and possibly up to 50% in some population. The prevalence of consanguineous marriages contributes to the autosomal recessive disorders. As a first step, a relevant strategy for the genetic eye disease would be the availability of guidelines to all ophthalmologists regarding advice to be given to the parents and patients with common inherited eye diseases. In order to create awareness of the importance of genetic eye diseases, specialized genetic clinics should be developed in tertiary centers to give treatment apart from genetic counseling. Health education programmers should promote awareness of the increased risk from consanguineous marriages especially when there is a prevalence of particular disease may be helpful.

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