

Eye Screening in School Children: A Rapid Way

Abdul Rasheed Qamar

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See end of article for authors affiliations

Correspondence to:
Abdul Rasheed Qamar
Associate Professor
Deptt. of Ophthalmology,
University College of Medicine
1 Km Raiwind Road, Lahore

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Purpose: A screening program was carried out in different school in Punjab to detect the children with refractive errors and refer them to nearest hospitals for treatment.

Materials and Methods: The screening program was carried out through the Sight First Program of Lion's Club International. 38575 school children in different school were screened in 3 years from 2002 to 2004. A maximum participation of the teachers and volunteer paramedical staff made it possible to screen this huge number of schoolchildren.

Results. Out of total 38575 schoolchildren 2069 (5.4%) were found to have refractive errors.

Conclusion: The protocol described in this paper can be used to screen a large number of children in less time and with minimal involvement of the ophthalmologist(s).

Early detection of refractive errors in children is very important. It prevents the development of amblyopia and increases the potential for more effective learning¹. The early treatment of amblyopia leads to better visual outcome².

In a trial on 177 children, conducted in Department of Ophthalmology, School of Neurobiology, Neurology and Psychiatry, University of Newcastle upon Tyne, it was observed that delay in treatment until the age of 5 years did not seem to influence effectiveness³. Age over 6 years is less likely to achieve successful outcome⁴. This shows the importance of school health service. In France a 23 years experience of involving the Mother and Child Welfare Services with School Health Services has shown better results⁵. Unluckily both these services are rudimentary in Pakistan.

In this paper a protocol has been described which was used by author in screening school children

through Sight First Program of Lion's Club International.

MATERIALS AND METHODS

The Sight First Program is run on noncommercial basis exclusively by the volunteers. The eye screening program was done in 3 steps.

Step 1. Teaching the Teachers.

On the day of screening the first step was to brief the teachers about the signs which they can themselves detect in the children with refractive errors. I have found that when these signs are discussed with the teachers, most of them had already noted them in some of students in their class not knowing their significance. After the discussion, the teachers were asked to go to their classes and note carefully these signs in all of their students. This did not waste any time of the students because these signs could be noted during their routine teaching.

The signs were:

1. Placing the book very close to the eyes when reading.
2. Squinting: The teachers very readily learned the Hirschburg test
3. Closing or covering one eye.
4. Excessive blinking.
5. Frequent “day dreaming”.
6. “Learning disabled or “ trouble makers” when they otherwise had good IQ.
7. Children already using glasses.

I have noted that the students which had been isolated by the teachers on the basis of these signs were almost always “positive “, in the sense that they did have a problem. The “negative” cases (not detected by the teachers) were covered by giving the students an option to go to step 2 if they felt any problem.

Step 2: Eyesight Testing

In step 2 the children were taken to the eyesight testing area. These children were from two sources:

1. The children isolated by the teachers in Step 1.
2. The children who themselves felt that they had defective vision.

The eyesight testing area consisted of a square marked on the floor of a hall or in the playground. Each side of the square was 12 meters so that when “vision box” was placed in the center, it was about 6 meters from each side (Fig 1).

The children stand on the middle part of each side and by occluding each eye one by one read the chart. Those who could read whole of the chart with each eye had normal eyesight and were sent back to the classes.

The trained paramedical staff was present in the eyesight testing area to guide the children. They also sent the children, according to their age, to the side of the vision box with E chart, pictures or letters.

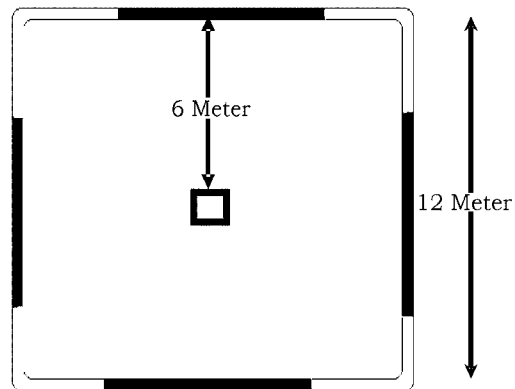


Fig 1: Eyesight testing area consists of a square 12 m x 12 m. The vision box which is in the center is 6 m from each side. The children stand on the middle part of each side (shown as the darker part). The children stand, according to their age, to the side of the vision box with E chart, pictures or letters.

In this method the turn over was very fast because every 5 minutes about 20 to 40 children could check their eyesight depending on the efficiency of the paramedical staff. It must be noted that most of the children were checking their eyesight themselves. Only very young children needed help. Most of the children were normal. They either wanted to confirm their eyesight of just came for fun sake. They were not discouraged.

The paramedical staff recorded the eyesight of only those children who had defective vision and referred them for step 3.

Step 3. Final Disposal

In the step 3 the children referred from step 2 were examined by an ophthalmologist. Their eyesight was rechecked and a pinhole test was done to confirm the refractive errors. They were advised treatment if time and facilities permitted otherwise they were referred to the nearest hospitals with their concurrence.

Table 1: Number of children detected in different Steps of screening programs n (%)

Children detected in step 1	1647 (4.3)
Confirmed in step 2	1288 (78.2)
Final confirmation in step 3	1130 (68.6)

Children detected directly in step 2	954 (2.5)
Confirmed in step 3	939 (98.4)
Total children in step 3	2069 (5.4)

the product of the process of evolution of a number of procedures tried and rejected. It involves the teachers and paramedical staff for eye screening, although every one is working under the direct supervision of the ophthalmologist(s).

RESULTS

The screening program was conducted in 18 schools in Punjab. 38575 school children from KG to Class 10 were screened during 3 years from 2002 to 2004.

A total number of 2069 (5.4%) children were detected to have refractive errors. In step 1, 1647 children were detected and referred for step 2. Out of these 1647 children 1288 were found to have decreased vision. When these children were referred to step 3 for confirmation 1130 children were confirmed to have refractive errors. Out of the children directly reporting in step 2, 954 were found to have decreased vision. From this group 939 children were confirmed to have refractive errors. The children diagnosed in different steps of screening programs are shown in (Table 1).

DISCUSSION

The importance of the eye screening in children cannot be overestimated considering the value of prevention of permanent amblyopia. The magnitude of the problem can be assessed by a study conducted in Muscat, Sultanate of Oman. In this study 416,157 school children were evaluated for their visual status and it was found that 28,765 (6.9 %) students had defective vision⁶.

Our result showed 5.4% of schoolchildren having refractive errors. It may be that some cases were missed in these rapid screening programs. It is recommended that, to be more effective, such screening programs should be repeated at regular intervals by different organizations.

In Birmingham, UK a study has shown the efficacy of optometric profession⁷ for this purpose. In Pakistan the qualified optometrists are not available for screening programs. So we mostly depend upon the ophthalmologists for these programs. The screening programs are very time consuming, exhausting and difficult to run especially on noncommercial volunteer basis.

Considering these difficulties and limitations I have always been trying to make the Eye Screening Program more effective with minimum wastage of time and convenient both of the school children and the screening team. The protocol presented is in fact

CONCLUSION

The protocol is useful economical and easy to perform for those interested in eye screening programs for the children. The real benefit of the eye screening programs is when they are repeated at regular. A mandatory eye examination or health evaluation at the time of admission in school will gradually reduce the need for such big exercises.

Author's affiliation

Dr. Abdul Rasheed Qamar
Associate Professor of Ophthalmology,
University College of Medicine
1 Km Raiwind Road, Lahore

REFERENCE

1. **Krumholtz I.** Results from a pediatric vision screening and its ability to predict academic performance. *Optometry.* 2000; 71: 426-30.
2. **Williams C, Northstone K, Harrad RA, et al.** Amblyopia treatment outcomes after screening before or at age 3 years: follow up from randomised trial. *Br J Ophthalmol.* 2002; 324: 1549.
3. **Clarke MP, Wright CM, Hrisos S, et al.** Randomised controlled trial of treatment of unilateral visual impairment detected at preschool vision screening. *BMJ.* 2003; 327:1251.
4. **Hussein MA, Coats DK, Muthialu A, et al.** Risk factors for treatment failure of anisometropic amblyopia. *JAAPOS.* 2004; 8: 429-34.
5. **Speeg-Schatz C, Lobstein Y, Burget M, et al.** A review of preschool vision screening for strabismus and amblyopia in France: 23 years experience in the Alsace region. *Binocul Vis Strabismus Q;* 19: 151-8.
6. **Khandekar RB, Abdu-Helmi S.** Magnitude and determinants of refractive error in Omani school children. *Saudi Med J* 2004; 25:1388-93.
7. **Logan NS, Gilmartin B.** School vision screening, ages 5-16 years: the evidence-base for content, provision and efficacy. *Ophthalmic Physiol Opt.* 2004; 24: 481-92.