

Original Article

## Assessment of Low Vision and Blindness in Children with Multiple Handicaps

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### ABSTRACT

**Background:** Difficulties in ophthalmologic evaluation in children with multiple handicaps makes it challenging to identify the causes among the disabled children.

**Methods:** This cross-sectional study was conducted at the department of Ophthalmology of Sher-E-Bangla Medical College & Hospital, Barishal between July 2019 and June 2021. Eleven hundred and twenty-nine children with visual impairment were examined. History, physical examination and ophthalmologic evaluation like visual acuity, slit lamp evaluation and fundoscopic examination was performed. Data was collected in data collection sheet and analyzed with Microsoft excel.

**Results:** About half of the children 567 (48.9%) presented with single or multiple handicaps along with the visual impairment. Different causes of visual impairment were identified. Among them about one third (37%) were optic nerve atrophy, about one fifth (22%) were cortical visual impairment. Other causes were retinopathy of prematurity, toxoplasmic macular retinochoroiditis, ocular development abnormalities, congenital cataracts. Handicaps were physical disability 68%, cognitive difficulty 25.2%, hearing impairment 4.5% and global developmental delay 2.3%.

**Conclusion:** About half of visual impairments are due to optic nerve atrophy and cortical visual impairment. Optic atrophy occurs mainly at perinatal periods. Physical disability is commonest form of multiple disability.

**Keywords:** Blindness in children, Blindness in handicapped children, Low vision in children

### INTRODUCTION

Early onset visual impairment can hinder experiences and access to information, which can interfere with the motor, cognitive, and emotional development of children.<sup>1</sup> The factors that contribute to the condition, such as the age of onset, presence of other disabilities, environmental factors, and their interactions, can determine the extent of developmental difficulties and delays in affected children.<sup>2</sup>

The prevalence and causes of childhood visual impairment can be related with geographical region, research timeline, socioeconomic status.<sup>3-5</sup> According to Gilbert and Foster, the prevalence of blindness in early life ranges between 0.3/1000 and 1.0/1000 below the age of five.<sup>5,6</sup> The prevalence of multiple disabilities

(MD), which is the presence of two or more disabilities in the same individual, is higher in developing countries and more common among populations with visual impairment. However, its prevalence varies across studies.<sup>4</sup>

To enable global comparison of childhood visual impairment data, Gilbert, Foster, and Negrel proposed a standardized record format.<sup>7</sup> In Latin America, data on the prevalence and causes of blindness are limited due to a lack of population studies and case records.<sup>8</sup>

The present study focuses on a proportion of children with visual impairment associated with one or more disabilities, who were evaluated at the Ophthalmology Department of Sher-E-Bangla Medical College & Hospital, Barishal.

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## METHODS

It was a cross sectional study of 1129 paediatric patients age between 0 and 15 years, having difficulty in vision at Sher-E-Bangla Medical College and Hospital, Barishal between July 2019 and June 2021. Clinical data included were visual acuity, slit lamp evaluation, fundoscopic examination and different disabilities. A proforma was prepared with patients name, age, sex, address, chief complaints, history of present, past ocular and systemic illness, family history, treatment history. These data were collected in the prescribed proforma and was recorded accordingly. Analysis was done with Microsoft Excel.

## RESULTS

About half of children (567, 48.9%) presented with single or multiple handicaps along with the visual impairment. Among them 50.1% had only visual impairment and 49.9% had multiple disabilities along with visual impairment (Figure 1). About three-fourth of the children (78.2%) were from Barishal, 19.3% were from other towns.

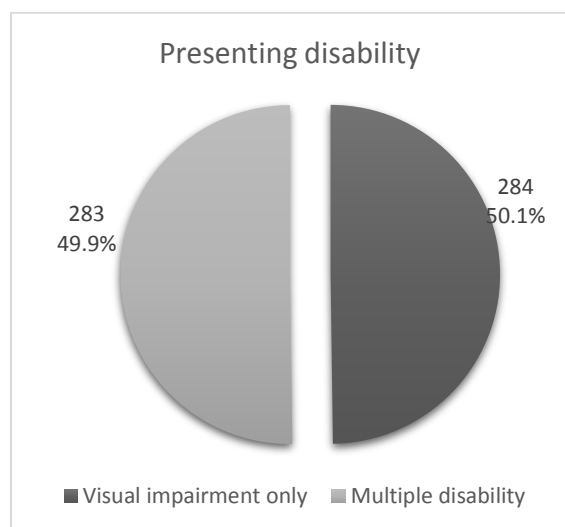


Figure 1: Pie chart showing presenting disabilities

Different causes of visual impairment were identified. Among them about one third (37%) were optic nerve atrophy, about one fifth (22%) were cortical visual impairment. Other causes were retinopathy of prematurity, toxoplasmic macular retinochoroiditis, ocular development abnormalities, congenital cataracts (Table 1).

Table-1: Causes of Visual impairment in multiple disability (n=567)

Causes	No of patients	%
Optic atrophy	210	37%
Cortical visual impairment	125	22%
Congenital toxoplasmosis	48	8.4%
Retinopathy of prematurity	41	7.3%
Ocular malformations	38	6.7%
Congenital cataracts	34	6%
Hereditary diseases of retina and macula	24	4.3%
Others	47	8.3%
Total	567	100%

About half (51.1%) of optic atrophy were due to perinatal factors, intrauterine factors were 21.2% where postnatal factors were 16%, rest were hereditary factors and unknown (Table 2).

Table -2: Aetiology of optic atrophy

Causes	Percentage	Total
Hereditary factors	3.6%	41
Intrauterine factors	21.2%	239
Perinatal factors	51.1%	577
Postnatal factors	16%	181
Unknown	8.1%	91

Physical disability observed in 68% cases, cognitive difficulty in 25.2%, hearing impairment making up 4.5% of the cases, and global developmental delay: in 13 patients (Table 3).

Table-3: Associated disabilities

Disabilities	Number of patients	Percentage
Physical disability	386	68%
Cognitive difficulty	142	25.2%
Hearing impairment	26	4.5%
Global developmental delay	13	2.3%
	567	100%

## DISCUSSION

About half of the children (48.9%) were multiple handicaps. Studies with multiple handicaps are relatively infrequent.<sup>9,10</sup> It is difficult to conduct study with children having multiple disabilities. As because these children have difficulties in social interaction and communication. These make it challenging to examine and interpret the findings of ophthalmological evaluations.<sup>2</sup>

About one fourth of the children in the study of Blohmé and Tornqvist had mental disability with optic atrophy and about 40% had cortical visual impairment.<sup>11</sup> In our study we found about 37% optic atrophy with cognitive difficulties and about 22% cortical visual impairment.

The retinopathy of prematurity was observed in 7.3%. At present time extreme premature baby has an increasing survival rate that is associated frequent cases of retinopathy of prematurity. In this study we found 7.3% cases of retinopathy of prematurity. We had congenital cataract about 6% in our study. That is very similar to the literature data showing 5 to 20%.<sup>5,13</sup>

We found that about half of our optic nerve atrophy was due to perinatal causes. And these are alarming in the developed countries.<sup>5,9</sup>

In the study of Armitage, it was found that about 34.9% of the study children with visual impairment had sensorineural deafness.<sup>12</sup> In our study, we observe 4.5% children with multiple disability had hearing impairment along with visual impairment.

## CONCLUSION

About half of visual impairments are due to optic nerve atrophy and cortical visual impairment. Optic atrophy occurs mainly at perinatal periods. Physical disability is commonest form of multiple disability.

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