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Research Article

A Cross-Sectional Study on the Causes of Severe Visual Impairment and Childhood Blindness among Children in Blind Schools in Northern Uttar Pradesh

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Abstract

Aim: To investigate the primary anatomical and etiological causes of severe visual impairment (SVI) and childhood blindness among children enrolled in blind schools in northern Uttar Pradesh,

Objective: Informing public health planning, early intervention, and genetic counselling strategies.

Methodology: This study investigates the primary anatomical and etiological causes of severe visual impairment (SVI) and childhood blindness among students enrolled in blind schools in northern Uttar Pradesh. A cross-sectional analysis of 98 children was conducted, with the aim of contributing to public health planning, early intervention, and genetic counseling strategies. Major causes were found to be congenital in origin, with a substantial proportion linked to suspected hereditary and chromosomal anomalies. Preventable postnatal causes such as trauma, measles, and vitamin A deficiency were also identified.

Results: Congenital ocular anomalies such as coloboma, microphthalmos, congenital cataract, foveal hypoplasia, and retinitis pigmentosa were predominant.

Key words: Ocular anomalies, Severe Visual Impairment (SVI), Childhood blindness

1. Introduction

Childhood blindness is a significant public health concern, particularly in low- and middle-income countries where early detection and treatment may be limited. In India, it is estimated that over 3 million children are blind or have severe visual impairment (1). Understanding the underlying causes of childhood blindness can inform effective prevention and rehabilitation strategies. Previous studies have highlighted a shift from preventable causes to irreversible congenital anomalies as leading contributors (2). Attempt were made to find the detectable cause of child blindness in a study in 1992 by Foster and Gilbert (3). It was found that retinopathy of prematurity (ROP) is a leading cause of preventable childhood blindness in India (4).

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This study was conducted to identify and categorize the anatomical sites and etiologies responsible for SVI and blindness in children attending blind schools in northern Uttar Pradesh, thereby filling a critical data gap in the region.

Methodology:

A descriptive, cross-sectional study was conducted across six blind schools in northern Uttar Pradesh over a period of 12 months (January–December 2023). A total of 98 children were clinically evaluated at Sitapur Eye Hospital.

Data collection involved structured interviews with guardians and comprehensive ocular examinations including visual acuity testing, slit-lamp bio microscopy, fundus evaluation, and intraocular pressure measurement. Anatomical classification was based on WHO/PBL eye examination records, while etiological classification was based on presumed hereditary, intrauterine, perinatal, or postnatal causes.

2. **Duration of Research**

The study was conducted over 12 months (January–December 2023) to allow adequate recruitment and evaluation across six blind schools.

3. **Demographic Data of Participants**

Total 98 participants taken part in this research out of which 74 were males (75.3%), and 24 females (24.7%) Fig-1. Out of all participants majority were between age group 5-16 while one participant aged 26 years with childhood-onset blindness.

Socioeconomic background: Predominantly rural and semi-urban families with limited access to specialized eye care services

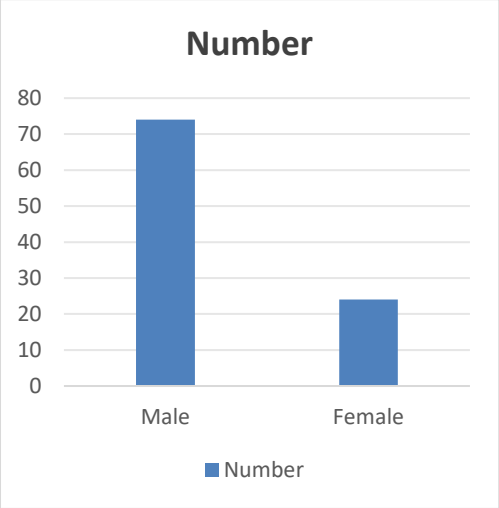

Fig-1 Demographic Data of Participants

Observations:

Following are the observations of present study-

- Gender distribution: 74 males (75.3%) and 24 females (24.7%).

- Age distribution: Majority between 5–16 years; one participant aged 26 years with childhood-onset blindness.

- Anatomical sites of abnormality: Whole globe (41.87%), cornea (22.53%), lens (15.3%), retina/optic nerve (remaining). Fig-2

- Etiology: Hereditary (50.1%), unknown (28.63%), postnatal causes such as trauma, measles, and vitamin A deficiency (23.12%). Chromosomal anomalies were suspected in congenital cases.

Results:

Congenital ocular anomalies such as coloboma, microphthalmos, congenital cataract, foveal hypoplasia, and retinitis pigmentosa were predominant, which aligns with earlier studies (5,6). Preventable causes like measles and vitamin A deficiency, though smaller in proportion, remain significant contributors.

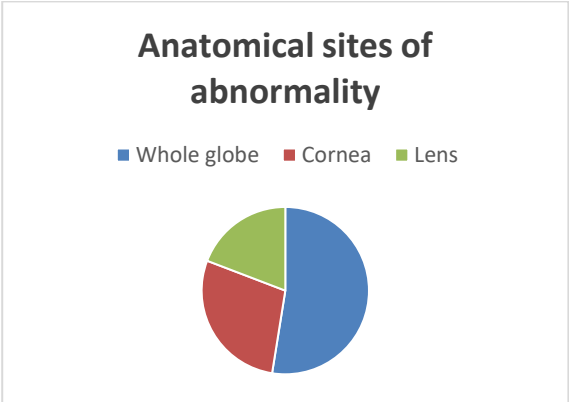

Fig-2 Anatomical sites of abnormality

Conclusion:

Congenital and hereditary ocular anomalies are the leading causes of childhood blindness in northern Uttar Pradesh. With half of the cases linked to genetic factors, genetic counselling and early screening programs are essential. Preventable causes such as vitamin A deficiency and measles can be effectively reduced through immunization and nutritional programs.

Conflict of Interest:

Author declares no conflict of interest.

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