Original Article

Causes of blindness in the schools for the blind

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Abstract

Objective: The objective of my study was to understand the etiology of blindness among students in school for the visually disable and to evaluate their current blindness status and recommend the best prevention and treatment measures to improve the vision of blind students.

Study design: This was a cross-sectional, descriptive study.

Place and duration of study: The study was conducted in in August 2018 at Shamsabad Rawalpindi Girls College and Government Qandeel Kohati Bazar Rawalpindi High School for the Blinds.

Material and Methods: A total of 254 students of two blind schools were screened for their visual status, by team of ophthalmologist, optometrist and ophthalmic technicians. Impairment of vision VI is classified according to world health organization guidelines. Eye care is provided and students are taught how to change glasses change filters and replace low vision aids (LVAS). School records were also used to determine the significance of impairment of vision in each case. Students requiring eye surgery medical examination or surgical procedure under local and general anesthesia (EUGA) were managed at Benazir Bhutto hospital. SPSS version 22 was used for data analysis.

Results: A total of 254 students—138 girls (54.3%) and 116 males—met the inclusion criteria. (45.6%) the average age was 17 years range (4-25 93% of those aged 11 and over). mild blindness occurred in less than 1% of patients moderately decreased vision(MVI) in 35.8% and severe blindness in 42.1%. 24.1% were blind (visual acuity less than 3/60) ,11.1% of whom were no light Perception. Vascular and venous disorders accounted for 45.0% of the research population's etiology of blindness and VI. Forty-five percent of student's blindness is caused by cataract, glaucoma, strabismus and other reasons. About 85% of cases indicated that switching devices was necessary to obtain a better perspective. The majority of parents of pupils with vision impairments are cousins' spouses. In this study, 69.3% of the pupils had a good family history.

Conclusion: It is true that many patients with VI and blindness are due to failure to prevent it .Burden of blindness can be reduced if timely and appropriate intervention is made**.** The causes of blindness was diverse amongst our study population. There are certainly lots of issues by which VI and Blindness natural stand causes. If timely interventions done properly and in the earlier stage of diseases like this before they permanently damage a human body, burden for blindness can be reduced to very far extent.

Keywords: blind school, blindness, low vision aids, refractive errors, corneal opacity, RP.

1. Introduction

Visual acuity with the best optical quality is less than 3/60 or the corresponding vision loss is less than10 degree. Impairment of vision including low vision and blindness.[1]

Impairment of vision services or care

Visually disable patients are those with visual acuity less than 6/18 who retain visual function even after correction and or optical standard or visual acuity of less than 10 degrees corrected but it is important to use or be able to use vision to plan and to work.

Blindness

It affects a person's health and work as well as sense of personal scarcity. Prompt treatment of many causes of vision loss can improve vision skills and self-confidence intervention, instructions if applicable information regarding preventable and treatable causes of blindness is provided to assist law enforcement management it can be optical non-optical or electronic.[2] An estimated 1.3 billion people worldwide are thought to be affected by some kind of visual impairment.[3]

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The sense of sight is thought to be the most important sense and the visual impairment is the most feared disability. In addition to a personal feeling of deficiency, it affects the social and economic status of an individual also.

In addition, children with visual impairments face additional challenges in their schooling, upbringing, development of skills, independence, and other areas. However, many of the causes of visual deficiency can be identified and promptly managed to enhance visual status, skill development, and self-reliance. In addition, the purpose of this study was to screen the pupils from two blind schools in order to determine the reasons of blindness, the students' level of VI, and, if necessary, recommendations for any interference. Numerous national and international studies have been conducted on the causes of VI, how to classify VI, and what treatments are recommended for various age groups.[5,6,7,8]

For the goal of managing the situation by the government, the results provide information regarding preventable and treatable causes of blindness. Low-vision gadgets are made to help individuals with low vision perform better visually, allowing them to adapt socially and academically and enriching their daily experiences.[1,2] They may be electronic, non-optical, or optical.

WHO recommendations for blindness (BL) and visual impairment[3]

1.<6/12 slight visual impairment MVI

2. <6/18 mild visual impairment

3. <6/60 severe impairment of vision

4. 3/60 Lack of vision

5. No PL blindness without sense of light

Visual Disability in Children and its Vast Spectrum of Consequences for Education, Skill Acquisition, Upbringing and Self Independence etc.

The visual status Impact on Education: Although many causes of blindness are not preventable, early detection and prompt action can lead to direct or indirect intervention for improvement in the childrens level skill achievement; self-reliance with less dependence.[4]

2. Materials & Methods

We conducted this cross-sectional study in two schools for the visually disable in Rawalpindi. Obtain permission beforehand from the principal of the school and have the instructor or student guardian sign or stamp the permission paper. The school for the visually impaired was visited by a team of optometrists, ophthalmologists, and participants.

An ophthalmologist must approve all eye treatments, including surgery, laser treatment, mydriatic refraction, indirect ophthalmoscopy, intraocular pressure measurement, and the history of blindness and marriage. Optometrists also assess visual acuity with LVAs. If required, EUGA was carried out at Benazir Bhutto Hospital's eye department.

Information is recorded according to the following variables demographic information name age gender address etc. Often advised or addressed etiology of blindness and VI, BCVA and recommendations about replacement of glasses, filter and low vision aids.

Inclusion criteria: students of blind school having best corrected visual acuity in the better eye of <6/18.

Exclusion criteria: students of blind school having best corrected visual acuity better than 6/18 with both eyes.

Duration of study: it was for a period of 4 months, according to the chalked-out schedule (August-November 2018).

Data was entered and analyzed by SPSS version 22.

For categorization of VI we followed WHO guidelines.

3. Results

A total of 252 students fulfilled the requirements for admission, with 138 (54.3%) being female and 116 (45.6%) being male. The age range was 4-25 years, with 93% of the population being 11 years of age or older. The average age was 17 years. In this study population, corneal opacification (sclero

cornea, keratoconus, ophtalmia neonatorum, trauma, Trachoma, and corneal dystrophies) accounted for 48 cases (18.9%) of blindness; other causes included glaucoma (18 cases), squint and amblyopia (14 cases; 5.4%), and refractive errors (22 cases; 7.3%). There are 110 cases (45%) of retinal and optic nerve illnesses and nystagmus (Retinitis pigmentosa, Rod and Cones dystrophies, Stargardt's disease, optic atrophy, etc.).

Table 1: Major causes of VI and blindness in 254 students in descending order

Diagnosis	Frequency	%
Retinal and optic nerve diseases (Retinitis pigmentosa, Rod and Cones dystrophies and Stargardt's disease, hereditary optic atropy and Nystagmus)	110	45.00
Corneal diseases (ophtalmia neonatorum, sclero cornea, keratoconus , Cornea plana, trauma, Trachoma, Corneal dystrophies)	48	18.9
Refractive error (high myopia, hypermetropia, astigmatism and anisometropia)	22	7.3
Glaucoma	18	7.1
Cataract	16	6.3
Squint and amblyopia (sensory deprivation)	14	5.4
Undetermined	26	10.2
Total	254	100.0

Regarding levels of visual impairment, two cases were having mild visual impairment (<1%), 91 cases (35.8%) had moderate visual impairment, 107 cases (42.1%) had severe visual impairment (<6/60) and 54 cases (21.4%) were blind out of which 28 cases (11.1%) were no PL blind.

Table 2: Relative frequency of different visual impairments and blindness

The following were some of the several low vision aids in use: In our study, 51 students (20.1%) used

Type of impairment	Frequency	Percent
Mild	2	<1%
Moderate	91	35.8
Severe	107	42.1
Blind	26	10.31
No PL Blind	28	11.1
Total	254	100.0

optical devices (78, 30.7%), non-optical devices (81, 31.89%), electronic devices (63, 24.8%), filters (54, 21.26%), and field extenders.

Table 3: Different Low Vision Aids in use

Name of device	Frequency	Percent
Optical	78	30.7
Non-Optical	81	31.89
Electronic	63	24.80
Filters	54	21.26
Field expanders	51	20.1
Total	254	-

The following information relates to students who our staff gave a better option for LVAs: Students were urged to replace their lenses, filters, electronic aids, field expanders (reverse telescopes) and non-optical aids in the following orders: 50, 32, 38, 9, and 88.

Table 4: Number of students advised a better option

Name of device	Frequency	Percentage
Spectacle change for better BCVA	50	19.68
Change Of Filter For Photophobia And Glare	32	12.59
Modification of electronic aid(talking software)	38	14.96
Field expander(reverse telescope)	9	3.54
Non optical aids	88	34.64
No change	37	14.56

The parents of the blind students had a significant percentage of cousin marriages. Positive family history was found in 176 (69.3%) of the participants in our study.

4. Discussion

Numerous domestic and worldwide investigations have been carried out with nearly identical goals, such as classifying visual impairments (VI), determining avoidable causes, evaluating appropriate low-visual impairments (LVAs), and offering recommendations for preventing or reducing childhood blindness. According to a nationwide study by Awan AR et al., which involved 725 fifth- and sixth-class pupils with an average age of ten years, the main causes of VI were refractive errors (89.3%), amblyopia (5%), cataracts (1.2%), corneal illnesses (1.8%), squints (1.8%), and nystagmus (0.6%). The study was done in schools in Muzzarabad (AJK, PAK).[5]

It was a research that screened students for typical school-age children, it was a screening-type study. At Ayub Medical College Abbotabad (PAK), Kazmi HS et al. conducted a second nationwide investigation on fifty children from a blind school.[6] They determined what caused VI and evaluated the state of vision. The majority of the cases—16, or 32% of the total—had retinal detachment (2 instances, or 4%), corneal diseases (20 cases cumulatively), problems related to development or trauma, and unknown (20%). The mean age of the patients was 12.32 years. With comparable objectives, studies from various countries—including China, India, New Zealand, Mali, Nepal, and Saudi Arabia—have been published internationally.[7,8,9,10]

In 2018, a population-based study conducted in New Zealand revealed that the prevalence rates of visually impaired people and blindness in children were 0.06% and 0.05%, respectively.[7]

The three reported aetiologies of blindness were optic nerve hypoplasia (9.0%), optic nerve atrophy (16.5%), and cortical blindness (31.5%).ROP (18.2%), others (10.3%), and newborn trauma (31.5%) were the avoidable causes of blindness. It shows childhood blindness in a wealthy nation where more stringent prevention measures need to be implemented. According to WHO standards, 104 blind school pupils had a blindness rate of 85.6% and a visually impairment rate of 14.4% in a 2018 study by N. Guirou et al. in Mali. As per their findings, the primary causes of blindness were: corneal opacities (26%), global Ametropia (60%) and lesions (19.2%).[8] Ninety-one percent of the 113 blind school kids in Andhra Pradesh, South India, who participated in a 2009 study by S Krishnaiah et al. reported being blind. Whole globe (41%) uvea (4%) retina (19%) optic nerve and glaucoma (6.3%), cornea (8%), lens (10%), and other disorders (11%), were the main etiological groups for the conditions of these blind students.[9]

The following were the main causes of VI in our study: disorders of the retina and optic nerve (such as optic atrophy, Stargardt's disease, Rod and Cones dystrophies, and retinalitis pigmentosa) 45 percent. 18.9% of cases are related to corneal disorders, including sclero cornea, keratoconus, trauma, trachoma, and corneal dystrophies. Refractive error (7.3%), glaucoma (7.1%), cataract (6.3%), and squint & amblyopia (5.4%) accounted for the instances listed in parentheses. (tab 1)

In 35.8% of the patients, moderate VI was present, and in 63% of the cases, severe VI to blindness was present. 11.1% did not have PL blindness.(tab 3) We recommend improved low vision assistance options

for blind school children.A total of fifty (50) students received advice on changing their spectacles, 38 on changing their filters, 32 on altering their electronic aids, 9 on field expanders (reverse telescopes) and 88 on non-optical aids.(tab 5)
The majority of the causes of blindness were consistent throughout studies, with a few exceptions related to regional and ethnic variations, the materials and techniques employed, and the extent of preventive strategies that were available.[10]

Conclusion:

Childhood blindness can have both treatable (amblyopia, squint, cataract, corneal opacity, glaucoma, refractive errors, etc.)

and preventable (genetic illnesses, nutritional deficiencies, amblyopia, trauma, etc.) causes. The general populace must have easy access to health facility centres so that early identification and fast treatment may be implemented, greatly reducing the burden of blindness in its early stages.

Recommendations:

To identify and treat visual disorders in children in a timely manner, strict screening programs for visual assessment are necessary. The following are suggested:
1. Paediatric screening facilities that are easily accessible and equipped to do the same should be established.
2. All tertiary care facilities should be equipped with the appropriate staff and equipment to provide the necessary medical, surgical, and laser treatments.
3. In situations when counselling is crucial, such as with inherited disorders skilled counsellors should be used for things like follow-up visits, the use of optical gadgets,etc.
Social Security and other organisations ought to assist the underprivileged.

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