European Journal of Molecular & Clinical Medicine (EJMCM)
ISSN: 2515-8260 Volume 07, Issue 08, 2020

Original research article

A prospective observational study to assess the clinic-etiologic profile of visual impairment in Bihar Region

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Abstract

Aim: The aim of the presents study to determine the clinical Profile of Causes of Visual Impairment in Bihar Region.

Methods: A prospective observational study was conducted in the Department of Ophthalmology, Jawahar Lal Nehru Medical College and Hospital, Bhagalpur, Bihar, India, for 24 months. 100 patients were included in this study. History was obtained regarding any ocular complaints, and a detailed ophthalmic examination was done which included a detailed torch light examination, assessment of visual acuity using Snellen's distance vision chart and Times New Roman near vision chart, tonometry using Schiotz tonometer, and fundus examination using direct ophthalmoscope.

Results: The majority of the participants 45(45%) were middle-aged belonging to the age group of 40-60 years; while the least 6(6%) were those aged below 20 years .The majority i.e. 72(72%) participants used L.P.G as fuel at home; while coal, wood or cow dung was used by 22(22%) and 6(6%) used both. The participants studied were grouped into; no visual impairment i.e. 75(75%), visual impairment Grade 1 i.e. 15(15%), Grade 2 i.e. 5(5%) or blindness Grade 3 i.e.4(4%), Grade 4 i.e. 1 (1%) based on WHO classification of low vision. Out of the 100 patients that were studied, majority i.e. 85 patients (85%) had refractive errors. In some cases, more than one type of refractive error was noted. Majority of the participants 30(30%) had hypermetropia, followed by myopia 22(22%) and astigmatism 14(14%). In 67% of individuals aged 40 years and above, presbyopia was noted. 1 patient (1%) had a nebular corneal opacity, which had developed following trauma with an iron nail. 22 patients i.e. 22% had cataract; out of which, 15 patients had bilateral cataract, and 7 patients had unilateral cataract. 5 patients (5%) that were studied were found to have glaucoma. 2 patients were aged more than 40 years and had primary open angle glaucoma. 3 patients (3%) had optic atrophy due to causes other than glaucoma. 6 participants (6%) presented with retinopathy due to diabetes or hypertension. 3 patients i.e 3% had macular diseases such as age related or hereditary macular degeneration.

Conclusion: We concluded that the health education and creating a greater awareness among the population are the only means by which they can be identified at the earliest and treated accordingly. This will reduce the burden of visual impairment and blindness, which will in turn reduce the economic burden on our society.

Introduction

Prevention of childhood blindness is a priority of the World Health Organization's Vision 2020: The Right to Sight.[1] In India, the prevalence of blindness in children under 16 years of age is estimated to be approximately 0.8/1,000.[2] It is estimated that at least 200,000 to 300,000 children in India have severe visual impairment or blindness and approximately 15,000 are in schools for the blind.[2,3] This is significant in terms of total number of

disability-adjusted life years lost, social and functional challenges, and lifelong burden on the child and caregivers.[4] Many causes of severe visual impairment and blindness (SVI/BL) in children are avoidable, either preventable or treatable. There are geographical variations in the major causes of childhood blindness.[5]

According to WHO, blindness is visual acuity worse than 3/60 with best correction in better eye[6] Childhood blindness is a devastating physical condition and has a deep emotional and economic impact. It is an important cause of blindness worldwide.[7] It refers diseases and conditions occurring in less than 16 years of age, if left untreated, leads to severe visual impairment that are not likely to be treatable later in life.[8] World Health Organization's (WHO) "Vision 2020: the right to sight" was launched in 1999. Its main aim is to eliminate avoidable blindness worldwide by the year 2020.[9] Approximately 1.4 million children are suffering from blindness worldwide. Out of which 75% live in Africa and Asia.[10] Blindness in children does not show any coherence across regions. Socioeconomic development, availability of eye care services and primary health care are some of the major factors determining this issue.[10] In high-income countries, optic nerve and higher visual pathway lesion are important cause of blindness.[10] Whereas uncorrected refractive error, keratomalacia due to malnutrition and poor immunization, congenital cataract and glaucoma, ophthalmia neonatorum and other ocular infection, trauma, consanguineous marriage leading to increase in congenital abnormalities, are the major causes in low-income countries.[10] In middle-income countries an increases in cases of Retinopathy of prematurity is observed.

Material and Methods

A prospective observational study was conducted in the Department of Ophthalmology, Jawahar Lal Nehru Medical College and Hospital, Bhagalpur, Bihar, India, for 24 months after taking the approval of the protocol review committee and institutional ethics committee.

Methodology

After taking informed consent detailed history was taken from the patient or the relatives if the patient was not in good condition. The technique, risks, benefits, results and associated complications of the procedure were discussed with all patients. 100 patients were included in this study. The study participants included all patients irrespective of their age group, residing in bihar, who attended the Ophthalmology speciality outreach clinic. Informed consent was obtained and patients were interviewed by the investigators and information was entered, based on a pre-tested pre-designed proforma. Socio-demographic details of each study participant were obtained.

History was obtained regarding any ocular complaints, and a detailed ophthalmic examination was done which included a detailed torch light examination, assessment of visual acuity using Snellen’s distance vision chart and Times New Roman near vision chart, tonometry using Schiotz tonometer, and fundus examination using direct ophthalmoscope.

Data entry was done using Microsoft Excel 2010 version and statistical analysis included percentages and proportions.

Results

The majority of the participants 45(45%) were middle-aged belonging to the age group of 40-60 years;while the least 6(6%) were those aged below 20 years(Table 1).

59(59%) out of 100 participants were females, while 41(41%) were males, i.e. they were almost equally distributed.

Table 1: Age distribution of the study participants

Sex	**Number of patients=100**	**Percentage (%)**
Male	59	59
Female	41	41
Age group (years)		
Below 20	6	6
20-40	20	20
40-60	45	45
60-80	22	22
Above 80	7	7

The majority i.e. 72(72%) participants used L.P.G as fuel at home; while coal, wood or cow dung was used by 22(22%) and 6(6%) used both. The majority of the participants i.e. 47(47%) had completed higher secondary education or graduation, 20(20%) had completed post-graduation or were professionals. Only a minority of 6 participants (6%) were illiterates.
The participants studied were grouped into; no visual impairment i.e. 75(75%), visual impairment Grade 1 i.e. 15(15%), Grade 2 i.e. 5(5%) or blindness Grade 3 i.e.4(4%), Grade 4 i.e. 1 (1%) based on WHO classification of low vision (Table 2).

Table 2: Visual impairment among study participants

Categories of visual impairment	**Vision**	**Number of patients**	Percentage
No visual impairment	>6/18	75	75
Visual impairment			
Category 1	6/18 - 6/60	15	15
Category 2	6/60 - 3/60	5	5
Blindness			
Category 3	3/60 - 1/60	4	4
Category 4	1/60 - PL	1	1

Out of the 100 patients that were studied, majority i.e. 85 patients (85%) had refractive errors. In some cases, more than one type of refractive error was noted.
Majority of the participants 30(30%) had hypermetropia, followed by myopia 22(22%) and astigmatism 14(14%). In 67% of individuals aged 40 years and above, presbyopia wasnoted.
1 patient (1%) had a nebular corneal opacity, which had developed following trauma with an iron nail. 22 patients i.e. 22% had cataract; out of which, 15 patients had bilateral cataract, and 7 patients had unilateral cataract. 5 patients (5%) that were studied were found to have glaucoma. 2 patients were aged more than 40 years and had primary open angle glaucoma. 3 patients (3%) had optic atrophy due to causes other than glaucoma. 6 participants (6%) presented with retinopathy due to diabetes or hypertension. 3 patients i.e 3% had macular diseases such as age related or hereditary macular degeneration (Table 3).

Table 3: Distribution of ocular morbidities

Ocular morbidities	**Number of patients**	**Percentage (%)**
Corneal opacities	1	1
Cataract	22	22
Aphakia	1	1
Refractive Errors	85	85

Glaucoma	5	5
Optic Atrophy	3	3
Retinopathies	6	6
Macular diseases	3	3

Discussion

Globally, it is estimated that there were over 38 million blind persons in the world, and 110 million people with low vision in 1994[11] , which has increased to 324 million in 2012.[12] 90% of the world's visually impaired live in developing countries, with the main causes of blindness being cataract, trachoma, glaucoma, onchocerciasis, xerophthalmia, diabetic retinopathy and age related macular degeneration.[13] Hence it is important that these changes are detected at their earliest so that visual disability can be prevented. In our study, Out of the 100 patients that were studied, majority i.e. 85 patients (85%) had refractive errors. In some cases, more than one type of refractive error was noted. Majority of the participants 30(30%) had hypermetropia, followed by myopia 22(22%) and astigmatism 14(14%). In 67% of individuals aged 40 years and above, presbyopia was noted. Our study findings are similar to the findings of a study by Agrawal et al conducted in urban Meerut where 86.4% participants had refractive errors.[14] The high prevalence of hypermetropia in our study compared to that found by similar such studies by Haq et al[15] could be due to a higher prevalence of cataract found in our study. There are several studies done in India which have reported a high prevalence of hypermetropia after the 5th decade of life,[16,17] which correlate with the findings of our study. In our study, we also observed that the proportion of uncorrected refractive errors were greater in the lower educated group than the higher educated group, which is similar to that found in a study conducted by Prema et al[18] and another study by Dandona et al,[19] where they found that the proportion of uncorrected refractive error was higher among the lower educated individuals than the higher educated individuals. A single participant (1%) had a nebular corneal opacity, which he had developed following trauma with an iron nail. Similar results (0.4%) were found by Agarwal et al in their study.[14] However this value is much lower than that found in a study by Baldev et al[20] in Northern India (30.5%). This shows greater level of awareness about ocular injuries and their prevention in the bihar community, as well as good healthcare facilities and promptness to report to the ophthalmologist in the event of trauma. 22 patients 22% had cataract; out of which, 15 patients had bilateral cataract, and 7 patients had unilateral cataract. Our findings are similar to that reported by Dandona et al[21] in Southern India (25.3%). The highest rates of cataract were among elderly individuals, those from lower social classes using coal wood and cow dung as fuel, and among illiterates. Younger individuals who presented with cataracts were those following trauma, or other complicated cataracts following uveitis, or keratitis. 30% of the patients who had cataract were illiterates and 28% were those using coal, wood or cow dung as fuel, suggesting lower socio economic background. Similar results were found by Haq et al15, where 32.8% were illiterates and 24.9% belonged to low socio economic background. The high percentage of patients with cataract is probably due to higher average life expectancy in bihar, low socio economic status, illiteracy and lack of awareness about the treatable nature of cataract. 5 (5%) were found to have glaucoma. 2 patients were aged more than 40 years and had primary open angle glaucoma. The prevalence of glaucoma in our study is lower than that found by Baldev et al.[20] in their study (11.1%). In our study, 3% patients had optic atrophy due to causes other than glaucoma, these included 1 patient who developed optic atrophy secondary to traumatic optic neuropathy, 1 participant who had developed optic atrophy secondary to tobacco and alcohol usage, and 1 participants who had developed optic atrophy secondary to optic neuritis in the past.

Conclusion

The health education and creating a greater awareness among the population are the only means by which they can be identified at the earliest and treated accordingly. This will reduce the burden of visual impairment and blindness, which will in turn reduce the economic burden on our society.

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Received: 03-07-2020 || Revised: 07-08-2020 || Accepted: 22-08-2020