A Study to Evaluate the Causes of Visual Impairment amongst Patients Seeking Visual Disability Certificate

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ABSTRACT

BACKGROUND

Blindness being a major health problem in developing country, affects not only the individual but also his family and society while a number of causes of blindness are preventable if measures are taken at an earlier time. This study mainly focuses on finding these causes.

METHODS

Secondary data analysis was done from medical records of disability register of a tertiary eye care hospital in Kolkata for a period of one year. The cause of visual disability was ascertained. Additional data collected from records of each patient included age, gender, literacy, percentage of disability, marital and working status and also reason for obtaining the certificate.

RESULTS

240 case records (149 male and 91 female) were analysed and it was found that 79.17 % patients were in the working age group (21 – 60 years). 42 % of study population had congenital malformation as a cause of their disability followed closely by retinitis pigmentosa (38 %). 65.41 % were literate of which 54.14 % were working while 57.84 % were not working. 37.5 % patients obtained the certificate to avail travel benefit.

CONCLUSIONS

Congenital malformation and retinitis pigmentosa are the two major causes of blindness certification. Both can be prevented by genetic counselling and discouraging consanguineous marriage. Even other causes like retinal detachment, glaucoma etc. were all preventable diseases if treated at an earlier stage. Thus, based on these findings, guidelines should be framed to decrease the prevalence of blindness in the society.

KEYWORDS

Certification, Congenital Malformation, Disability, Best Corrected Visual Acuity (BCVA)

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BACKGROUND

In developing countries, blindness is a major health problem.[1] In spite of commonly existing global problem of under-registration, the data from fifty-eighth round of National Sample Survey Organization (NSSO) reveals that, of all the disabled individuals in India, 10.88 % were blind and 4.39 % had low vision.[2]

Loss of vision, either partial or complete may result from various ocular conditions. Non-treatable ocular causes often lead to permanent handicap. It's not only an individual but the whole society gets affected by this impairment. This burden of impairment ultimately affects productivity of a society. Earlier assessment of visual problems and their management is the key factor to prevent these sort of disability. Though we have different government sponsored programme for this purpose but due to different factors a large part of population of our country are not getting their benefit.

Visual impairment in India is categorized on the basis of its severity and percentages are accorded as proposed by a sub-committee constituted by the Ministry of Social Justice and Empowerment in 1999. According to the Ministry of Health's notification, only a person with disability more than 40 % will be eligible for any concession or benefit.[3]

This study was done to study the profile of ocular causes of disability certification in South-East Kolkata. The data might be used for planning such strategies that could reach the common people with ease which will lead to an effective prevention visual disability and improvement of eye health in general.

METHODS

This is a retrospective study done by analysing medical records in the disability register (secondary data analysis) of a tertiary eye care hospital in South-East Kolkata from 1st April 2016 to 31st March 2017. Patients certified by medical board as visually handicapped with a disability of 40 % and above were included in the study and those with incomplete data and without a clear cut diagnosis were excluded from the study. By following these criteria we have collected information of 240 patients (480 eyes). Patients attending the board were examined in the out-patient department. The information's gathered was age, gender, causative factor of disability, literacy and marital status of patients, working status and reason for obtaining visual handicap certificate.

After taking a proper history and performing necessary clinical examinations with slit lamp and applanation tonometer, direct and indirect ophthalmoscopy was done to arrive at final diagnosis. Humphrey visual field analysis was done when necessary. The percentage of disability was calculated according to the guideline of ministry of social justice and empowerment 1999. (Table 1)

The final diagnosis and category of visual disability had to be ascertained by three consultants of the department, only when they reach a consensus the final report was sent to disability board. Patient was again examined there by a member of the board and when everything was found according to government guideline, the certificate was issued.

Category	BCVA in the Better Eye	BCVA in the Worse Eye	Percentage of Visual Disability
I	6 / 18 - 6 / 36	6 / 60 to nil	40
II	6 / 60 – 4 / 60 or field of vision 10^0 - 20^0	Finger counting at 1 feet	75
III	3 / 60 – 1 / 60	Finger counting at 1 feet to nil	100
IV	Finger counting at 1 feet to nil or field of vision 10^0	Finger counting at 1 feet to nil or field of vision 10^0	100

Table 1. Categories of Visual Disability

Statistical Analysis

We have presented our data as actual numbers and percentage. Statistical significances were evaluated by software's such as Epi info and med-calc. Chi-square test was used to find out significance. A 95 % confidence level and an alpha error of .05 was considered acceptable.

RESULTS

Study population had a mean age of 37.83 ± 15.32 yrs. with a range of 7 yrs. to 75 yrs., median age being 37 yrs. Among them 149 patients (62.08 %; 95 % CI: 55.95, 68.22) were male and 91 (37.92 %; 95 % CI: 31.78, 44.05) were female giving a male: female ratio of 2.63 : 1. Male patients had a mean age of 37.34 ± 15.60 yrs. ranging from 7 yrs. to 75 yrs., median being 36 yrs. while female population had a mean age of 38.61 ± 14.80 yrs. with a range of 8 yrs. to n 72 yrs. and median of 37 yrs. The youngest patient was a male child aged 7 yrs. who had microphthalmos with nystagmus bilaterally and the oldest patient was 75 yrs. old male with bilateral optic atrophy.

% Disability / Age Group	100		75		40		Total		Grand Total (%)
	M	F	M	F	M	F	M	F	M + F
5 – 20 yrs.	17	7	3	3	5	0	25	10	35 (14.57)
21 – 40 yrs.	41	17	11	19	11	5	63	41	104 (43.33)
41 – 60 yrs.	40	20	11	12	1	2	52	34	86 (35.84)
➢ 60 yrs.	8	5	1	1	0	0	9	6	15 (6.26)
Total	106	49	26	35	17	7	149	91	240 (100)
Grand Total (M + F) (%)	**155 (64.58)**		**61 (25.42)**		**24 (10)**		**240 (100)**		

Table 2. Distribution of Study Population on the Basis of Age, Gender and Percentage of Disability

Table 2 shows 190 (79.17 %; 95 % CI: 74.03, 84.30) patients were in the working age group i.e. 21 yrs. to 60 yrs. while only 6.26 % were above 60 yrs. and 14.57 % were below 21 yrs. Within the working age group 43.33 % patients were between 21 to 40 yrs. of age and 35.84 % were in the 41 to 60 yrs. age group. In all the age groups males out-numbered females. This table also shows that

64.58 % of total study population had 100 % disability while 25.42 % had 75 % and 10 % had 40 % disability.

Table 3 shows that among the visually disabled congenital malformation was the causative factor in 42 (17.50 %; CI 95 %: 12.69, 22.31) patients followed closely by retinitis pigmentosa (15.83 %; 95 % CI: 11.21, 20.45) and corneal opacity (13.75 %; 95 % CI: 9.39, 18.11). We have included micro cornea, microphthalmos and choroidal coloboma in congenital malformation group.

Table 4 shows that 65.41 % of study population was literate and 34.59 % was illiterate. Among the literate patients 54.14 % were working, 41.40 % not working and only 4.46 % was studying while among illiterate population 42.16 % were working and 57.84 % were not working.

Gender	M (n = 149)	F (n = 91)	Total (%) (n = 240)
Causative Factor			
Amblyopia	1	1	2 (0.85)
Congenital Cataract	3	0	3 (1.25)
Congenital Malformation	24	10	42 (17.50)
Corneal Opacity	26	15	33 (13.75)
Diabetic Retinopathy	9	6	15 (6.25)
Glaucoma	16	9	25 (10.41)
Macular Dystrophy	6	8	14 (5.84)
Pathological Myopia	10	9	19 (7.91)
Optic Atrophy	12	9	21 (8.75)
Phthisis bulbi	12	5	17 (7.08)
Retinal Detachment	3	2	5 (2.08)
Retinitis pigmentosa	22	16	38 (15.83)
Staphyloma	5	1	6 (2.50)

Table 3. Distribution of Study Population Based on the Cause of Disability

Gender Literacy Level	Male (n = 149)		Female (n = 91)		Total (n = 240) (%)
Literate	98	Working - 54	59	Working - 31	157 (65.41)
		Not working - 38		Not working - 27	
		Studying - 6		Studying - 1	
Illiterate	51	Working - 22	32	Working - 13	83 (34.59)
		Not working - 29		Not working - 19	
		Studying - 0		Studying - 0	

Table 4. Distribution of Study Population Based on Literacy Level and Working Status

Level of Blindness Literacy Status	Moderate Blindness (40 % Disability)	Severe Blindness (75 % and 100 % Disability)
Literate	19	138
Illiterate	5	78

Table 5. Comparison of Literacy Status with Level of Blindness

χ^2 (Yates corrected) = 1.6044, p = .205284, not significant. No association exists between literacy status and level of blindness in our study.

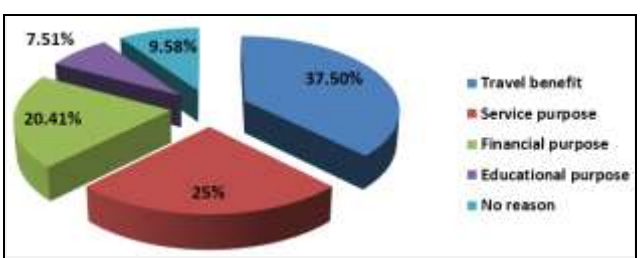

Figure 1. Distribution of Study Population According to the Reason for Obtaining Visual Handicap Certificate

This pie chart reveals that the reason behind obtaining visual handicapped certificate in most of the cases (37.50 %; 95 % CI: 31.38, 43.62) was to gain travel benefit followed by getting service benefit (25 %; 95 % CI: 19.52, 30.48) while 20.41 % obtained it to have some financial help.

DISCUSSION

There have been many studies in India[4] and abroad[5] regarding prevalence of blindness in the community. Evidence based information is important to plan low vision care and rehabilitation services. A visual handicap certificate not only assists in rehabilitation of disabled person, but also helps government agencies in planning better strategies to improve community eye health in general.

In our study we have found a mean age of 37.83 ± 15.32 yrs with a male: female ratio of 2.63 : 1. Similar findings were also revealed in a study by Joshi RS, where mean age was found to be 35.28 ± 21.63 yrs., but the male : female ratio was much lower (1.3 : 1).[6] In another study by Srinivas Siddegowda et al male : female ratio (2.24 : 1) was very close to our study.[7] This was probably due to the fact that certification being an institutional process it becomes rather difficult for females to reach the board due to social and economic obstacles also females in rural set up who are mostly house wife don't feel the necessity of obtaining a certificate.

Our study revealed that patients in the age group 21 to 60 yrs. constituted the largest group (79.16 %). This constitutes mainly the working age group carrying financial burden of family, as well as requiring benefits for education and travel. Probably for this reason they were more akin to obtain a handicapped certificate. More or less similar finding was noted in study by Srinivas Siddegowda et al (73.02 %) and Ghosh S et al (60.6 %).[8] Ina their study ThoudamRobi et al found 63.82 % patients in age group of 15 - 65 yrs. group.[9] These studies also revealed that patients above 65 yrs were much less in number similar to our study. Similar findings were also revealed by Bunceetal [10]

Among our study population majority (64.58 %) had 100 % disability, similarly in study by Srinivas Siddegowda et al, Parveen K Monga et al and Hegde SS, they found majority of patients were 100 % visually handicapped.[11,12]

In a study by Kareemsab D et al congenital anomaly was noted to be the causative factor of visual disability in majority of the cases (22.11 %) followed closely by refractive error (19.85 %) and retinitis pigmentosa (18.01 %).[13] Almost similar findings were seen in our study i.e congenital anomaly being the major cause (17.53 %) followed by retinitis pigmentosa (15.83 %). More or less same data was found in an article by Ghosh S et al where congenital anomaly was present in 38.71 % of the eyes. 13.75 % of patients were suffering from corneal opacity in our study which were probably due to vitamin A deficiency, corneal degeneration, Steven Johnson syndrome and keratoconus. Better awareness about immunization and nutrition, along with seeking early healthcare intervention might reduce these cases. Inadvertent use of systemic

medication without sensitivity test must be restricted. In studies by Joshi RS. (2008) and Herse p et al retinitis pigmentosa was found to be a major cause of blindness certification.[14] The reason may be an increase of consanguineous marriage due to lack of genetic counselling. In our study, about 24.58 % cases had a history of consanguinity. Stress on genetic counselling and discouraging consanguineous marriages is very essential to prevent congenital anomalies and RP. With increasing age our study revealed the leading causes of certification were retinal detachment (60 %), glaucoma (96 %) and diabetic retinopathy (86.67 %) mainly in the 41 - 60 yrs. age group. All these diseases were cause of preventable blindness. Ignorance about the disease process, progression and late presentation to healthcare facilities along with financial constrictions compound the problem. Eye check-up camps in outreach areas for educating and screening the patients along with quick referral to higher centres where rapid and cheaper treatment can be given, might save these eyes. Refractive errors, especially pathological myopia, accounted for 19 (7.91 %) of all cases which emphasizes the importance of school eye screening so that early detection and necessary management of complications can be done. In their study Dandona L et al commented that If 90 % of the blindness due to preventable corneal disease and glaucoma had been prevented another 2.7 million blind-person-years could have been prevented.[15]

Though in a study by Zheng Y et al concluded that inadequate literacy is the single most important risk factor associated with visual impairment and poorer vision but in our study we didn't find any association between the two.[16] This may probably be due to the fact that we were mainly dependent on the information found in medical records which couldn't be verified. We find this as a major limitation of our study. It may also be due to the fact that mere ability of reading and writing (considered as literate) doesn't make an individual aware of the possible measures for prevention of blindness, maybe there were lacunae on the part of education system, awareness programmes or outreach campaigns so that even being literate they couldn't avail the government programmes for their own benefit.

In his study Joshi RS found that 39 % of his study population obtained certificate for travel benefit while 37 % obtained it for educational purpose. A very low proportion of study population (9 %) wanted it for financial help. Similarly, in our study we found that bulk of the patients (37.5 %) had travel benefit as their cause of obtaining certificate followed by benefit in service (25 %) and financial help (20.41 %) as other causes.

CONCLUSIONS

Congenital malformation and retinitis pigmentosa are the two major causes of blindness certification. Both can be prevented by genetic counselling and discouraging consanguineous marriage. Even other causes like retinal detachment, glaucoma etc. were all preventable diseases if treated at an earlier stage. Thus, based on these findings, guidelines should be framed to decrease the prevalence of blindness in the society.

Limitations

Our study was a hospital-based study along with analysis from medical records. Hence, it cannot be taken as a reflection of aetiology and estimate of blindness in the population. However, a rough idea about the causes of visual handicap in the region might help to prepare general guidelines for early diagnosis, prevention and management of the commonly prevailing preventable causes and rehabilitation of such patients in the local community and society at large. These guidelines also becomes very important as for most cases of blindness there is no appropriate treatment but preventive measures like genetic counselling, routine immunisation, nutritional supplementation and awareness increase may play a very crucial role in their management.

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