Original Article

The Frequency and Causes of Visual Impairment and Blindness among Middle and Older Population

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Purpose: To estimate the frequency and causes of visual impairment and blindness in middle and older age groups.

Study Design: Cross sectional study.

Place and Duration of Study: Eye department of Dow university hospital (Ojha campus), Dow international medical college, Dow university of health sciences, Karachi, Pakistan from January 2010 to October 2010.

Material and Methods: 1000 subjects of aged ≥ 40 years were included in the study. We collected data from previous records in which patients had undergone complete ophthalmic examination including visual assessment by using Snellen's visual acuity chart, examining the anterior segment by slit lamp and dilated fundoscopy through slit lamp biomicroscopy with 90D lens. The causes of visual impairment and blindness were recorded from collected medical data. Statistical analysis was done by SPSS version 21.

Results: The 1000 subjects records were analyzed. The frequency of visual impairment and blindness were 142 (14.2%) and 49 (4.9%) respectively. Major causes of visual impairment were cataract 61 (43.0%) and refractive errors 44 (31.0%). Refractive errors 19 (38.8%) and cataract 18 (36.7%) were the main causes of blindness. There was a significant difference for the causes of visual impairment and blindness with normal individuals (p-value < 0.01).

Conclusion: The burden of visual impairment and blindness remains a major health problem in our society and government need to establish multiple policies and programs to prevent and control the visual impairment and blindness.

Key words: Causes, visual impairment, blindness.

Different eye disorders if left untreated lead to end stage of functional blindness. The prevalence and causes of these disorders differ markedly throughout the world. The percentage of blindness is particularly severe in Asia[1]. According to World Health Organization (WHO), the definition of blindness is corrected vision of less than 3/60 (20/400) in better eye, or a decrease in visual field to less than 10 from fixation in each eye and definition of low vision is corrected vision of less than 6/18(20/60) but equal to or better than 3/60 in better eye[2]. The visual acuity of less than 6/60 (20/200) is also used as a definition of blindness in many developed countries[3,4,5].

According to WHO estimations, currently there are 285 million people are visually impaired world wide in 2010, 39 million are blind and 246 million have low vision.[6] The individuals having blindness might increase up to 76 million by 2020. About 90% of individuals having visual impairment are belong to under developed countries[7,8]. Most of the blind people are in older age group 50 years and above (82%). According to the global estimate work, the infectious

diseases causing visual impairment is decreased for the last few years but the incidence of chronic noninfectious diseases causing visual impairment are supposed to increase in number. About 80% of all visual impairment can be prevented and treated. Cataract and refractive error are the most common causes of visual impairment and major cause of blindness is cataract[9,10]. Data collected from the last few years from many countries shows that there has been significant improvement in prevention and treatment of visual impairment and this was achieved through a number of successful international and local public-private partnerships.

The principle aim of my study was to estimate the frequency and causes of visual impairment and blindness in middle and older age population.

MATERIAL AND METHODS

This study was conducted from January 2010 to October 2010 in the Ophthalmology department of Dow university hospital, Dow international medical college, Karachi, Pakistan. Inclusion criteria were the individuals of aged 40 or > 40 years to 70 or > 70 years and visual acuity of 6/18 to ≤ 3/60. Exclusion criteria were the individuals of aged < 40 years and patients who had previously undergone ocular surgeries. These subjects had gone through detailed eye examination which included measurement of visual acuity, auto refraction, intraocular pressure measurement, slit lamp examination and dilated fundoscopy by slit lamp biomicroscopy through 90D lens. A well trained optometrist had assessed the visual acuity and auto refraction. Uncorrected and corrected visual acuity assessment were done by using Snellen's visual acuity chart. Best corrected visual acuity was obtained by optimal refraction subjectively after objective auto refraction. Goldmann applanation tonometry was done to measure the intraocular pressure. Slit lamp examination was done to look for eye lid pathologies, corneal and lens opacities to rule out the cause of visual impairment (< 6/18 - 3/60) and blindness (< 3/60) according to WHO criteria for definition of visual impairment and blindness. Detailed fundal examination was done by slit lamp biomicroscopy through 90D lens to look for vitreous and retinal pathologies.

Blindness was assessed as those individuals were reported visual acuity (VA) < 3/60, and also those reported counting fingers (CF), hand movement (HM), perception light (PL), and no perception light (NPL) were also categorized as "Blindness". "Visual impairment" (VI) was computed as those individuals who reported VA<6/18-3/60.

All analysis were performed using statistical analysis software SPSS version 21.Frequencies and proportions were reported for categorical variables including outcome measures blindness and visual impairment. Chi-square analysis was used to assess the association between blindness and visual impairment with effect of age and gender and the results were reported. The causes of visual impairment and blindness were also assessed. Chi-square analysis was also used to compare the different causes of visual impairment and blindness with normal individuals. The P-value of ≤0.05 was considered statistically significant.

RESULT

The 1000 subjects were examined. Out of 1000 subjects 532 (53.2%) subjects were male and 468 (46.8%) subjects were female. 49 (4.9%) persons were have blindness (VA < 3/60), in which 40 (4.0%) persons were found to have unilateral blindness and 9 (0.9%) were found to have bilateral blindness and 142 (14.2%) were have visual impairment (VA < 6/18 - 3/60), in which 87 (8.7%) were having unilateral visual impairment and 55 (5.5%) were having bilateral visual impairment (Table 1). The frequency of visual impairment and blindness were 142 (14.2%) and 49 (4.9%) respectively (Table 2). The effect of age and gender on blindness and visual impairment were shown in (Table 3). Most of blindness and visual impairment was found above the age of 50 years.

Causes of blindness and visual impairment were given in table 4. The leading causes of blindness were refractive errors 19 (38.8%), cataract 18 (36.7%) and diabetic retinopathy 9 (18.4%). Major causes of visual impairment were cataract 61 (43.0%) and refractive errors 44 (31.0%). Comparison between the causes of visual impairment and blindness with normal individuals were shown in table 5 with a significant p-value of less than 0.01.

DISCUSSION

The current study showed that cataract, refractive errors and diabetic retinopathy are the common causes of visual impairment and blindness presenting to ophthalmology department, Dow university hospital (Ojha campus), Karachi. The frequency of visual

Table 1: Frequency of blindness and visual impairment (n = 1000).

Normal		795
Bilateral Blindness	9	0.9%
Bilateral VI	55	5.5%
Unilateral Blindness	40	4.0%
Unilateral VI	87	8.7%
Blindness + VI	14	1.4%
VI: visual impairment		

Table 2: Frequency of blindness and visual impairment (n = 1000).

	n	**%**
Normal	795	79.5%
Blindness	49	4.9%
VI	142	14.2%
Blindness + VI	14	1.4%
VI: visual impairment		

Table 3: Blindness and visual impairment regarding age and sex. (n = 205).

	Blindness n (%)	**Visual impairment n (%)**	**Both conditions n (%)**	**p-value***
Age Group				
40 – 49	14 (28.6)	29 (20.4)	2 (14.3)	0.798
50 – 59	16 (32.7)	41 (28.9)	4 (28.6)	
60 – 69	12 (24.5)	43 (30.3)	5 (35.7)	
70 +	7 (14.3)	29 (20.4)	3 (21.4)	
Sex				
Male	26 (53.1)	76 (53.5)	7 (50.0)	0.969
Female	23 (46.9)	66 (46.5)	7 (50.0)	
p-value* calculated by using Chi-square analysis				

Table 4: Causes of blindness and visual impairment. (n = 205).

Causes	**Blindness n(%)**	**Visual impairment n(%)**	**Both conditions n(%)**
Diabetic retinopathy	9 (18.4)	19 (13.4)	-
Refractive error	19 (38.8)	44 (31.0)	9 (64.3)
Conjunctivitis	2 (4.1)	13 (9.2)	1 (7.1)
Cataract	18 (36.7)	61 (43.0)	4 (28.6)
Corneal Opacity	**1 (2.0)**	**5 (3.5)**	

Table 5: Causes of blindness and visual impairment with normal individuals (n = 1000).

Causes	Blindness	Normal	P-value
Diabetic Retinopathy	28 (13.7)	118 (14.8)	< 0.01
Refractive error	72 (35.1)	449 (56.5)	
Conjunctivitis	16 (7.8)	122 (15.3)	
Cataract	83 (40.5)	97 (12.2)	
Corneal Opacity	6 (2.9)	9 (1.1)	
VI: Visual Impairment p-value* calculated by using Chi-square analysis			

impairment and blindness among adults ≥ 40 years to older age groups > 70 years were 142 (14.2%) and 49 (4.9%) respectively. The study conducted in North Kordofan State, Sudan[7] showed that 8.37% prevalence of blindness of bilateral eyes and 9.06% prevalence of visual impairment of bilateral eyes. The results are comparable to our study in which the frequency of visual impairment was higher as compare to frequency of blindness. Another study conducted in Sudan[11] showed the prevalence of blindness in Northern State was 4.90%, 7.38% in Sinnar and 14% in Kassala. Our study showed the decrease in the frequency of blindness as compare to above quoted studies may be because of overall increase in the availability of eye care services as well as increase in the knowledge of general population regarding solutions like surgeries, refractive devices to manage the problems associated with visual impairment and blindness.

Association of blindness and visual impairment with effect to the different age groups and gender was not statistically significant in our study with p-value of 0.798 and 0.969 respectively while several studies[12-16] showed significant association of age and gender with the prevalence of blindness and visual impairment.

Our study showed that refractive errors were the most common cause of blindness. The results are comparable to other recent studies[17-19] showed the refractive errors were the primary cause of blindness. Cataract was the second most common cause of blindness in our study. Several studies conducted in Africa and Asia[20,21] have showed that the blindness and visual impairment were caused by cataract. Cataract is a curable condition and the burden of blindness caused by cataract can be reduced by public health awareness and cataract surgical services.

In summary, the frequency of visual impairment and blindness was 142 (14.2%) and 49 (4.9%) respectively. Refractive errors, cataract and diabetic retinopathy were the major causes of blindness. Cataract and refractive errors were the main causes of visual impairment.

CONCLUSION

The current study provides the useful information regarding the burden of visual impairment and blindness in our society and this burden can be reduced with early treatment and avoided by different preventive measures such as awareness, visual screening, early correction of refractive error, cataract surgeries for those individuals requiring it and effective visual rehabilitation for all visually impaired people.

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