*ORIGINAL ARTICLE*

# Causes Of Unilateral Blindness

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## ABSTRACT

**Aim:** To enlist the frequency of diseases that causes unilateral blindness (reversible & irreversible both).

**Study Design:** Cross Sectional study

**Duration and setting of study:** This study was done at OPD Ophthalmology, Hayatabad Medical Complex (HMC) Peshawar, from 1st March, to 30th June, 2019.

**Methods:** In this study all patients presenting with unilateral blindness to eye outpatient department, Hayatabad Medical Complex were included. Blindness was defined as presenting visual acuity of less than 3/60 in any one eye. After taking consent, the data was collected through Pre-designed questionnaire.

**Results:** A total 185 participants were included in this study. Male were 57.3% and 42.7% were female. Mean age of participants was 45 years. Cataract was most common cause and was found in 33.5% patients. However, 16.8% were diagnosed with retinal detachment (RD), 9.7% was having corneal opacity and glaucoma was diagnosed in 8.1% patients. Trauma was found in 7.0% of unilateral blindness, followed by diabetic retinopathy (DR) 6.5%, central retinal vein occlusion (CRVO) 2.7%, phthisis 1.6%, optic neuropathy (1.6%) and age related macular degeneration (ARMD) 1.1%. Other pathologies were 11.4% cases.

**Conclusion:** The most common cause found in our study was cataract followed by retinal detachment, corneal opacity, glaucoma, trauma, diabetic retinopathy, central retinal vein occlusion, phthisis, optic neuropathy, ARMD in descending order.


**Keywords:** Blindness, Unilateral blindness, Reversible blindness, Irreversible blindness.

## INTRODUCTION

Blindness is the inability to see anything including light.[1] Vision loss is related to socio-economic disadvantage.[2] At least one billion people have near or distance visual impairment globally and the burden of vision impairment in low and middle income countries can be even greater due to fewer opportunities to access eye care services.[3] According to World Health Organization, International classification of diseases 11 (ICD 11th edition 2018) vision impairment is classified into two categories (distance and near vision impairment) by International Classification of Diseases 11 (ICD 11th edition 2018). Distance vision impairment is classified as Mild when presenting visual acuity is less than 6/12 to 6/18, Moderate vision impairment- presenting visual acuity less than 6/18 to 6/60 while Severe vision impairment is classified as presenting visual acuity less than 6/60 to 3/60.[4] However, blindness is classified as presenting visual acuity of less than 3/60. Peshawar is the capital of the Khyber Pakhtunkhwa province. It is located near the historic Khyber Pass, close to the border of Afghanistan.[5] The city of Peshawar has a population of 2026851 persons out of which 1065188 (52.55%) are male and 961663 (47.44%) are female.[6] It is the sixth-largest city in Pakistan.[7] Hayatabad Medical Complex (HMC) is hospital providing tertiary care and it is the second largest hospital located in Hayatabad in suburb of Peshawar. It is a major teaching medical institute for under-graduate and post-graduate training Centre. Hayatabad Medical Complex provides both medical and surgical specialties in ophthalmology, dentistry, physiotherapy, cardiology,pediatrics,psychiatry, plastic surgery, dermatology etc. It is also accredited center for training in many ophthalmic super-specialties e.g. vitreo-retina, paedriatic ophthalmology, strabismus, orbit & oculoplasty and glaucoma. The aim of Hayatabad Medical Complex is to provide preventive, curative, rehabilitative, emergency and educational health services.[8] This hospital based study was conducted to gain knowledge about different pathologies causing unilateral blindness in our community. Data will be shared with health care authorities to plan better future strategies for management of blinding pathologies.

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## METHODS

Non-probability convenient sampling technique has been used in our cross sectional study. Total 185 patients were included in this study. It was conducted at HMC Peshawar during a span of 4 months to determine the frequency of different pathologies causing unilateral blindness. All patients presenting to eye outpatient department with unilateral blindness (presenting visual acuity less than 3/60) in any one eye were included in the study. After taking informed verbal consent of the patient, detailed history and thorough examination was done by consultant. Diagnosis was taken as classified by consultant ophthalmologist. Data was collected through pre-designed questionnaire and analyzed in SPSS version 17.

## RESULTS

A total 185 participants were included in this study, 106 (57.3%) were male. The mean age of study subjects was 45 years (the maximum age was 106 years and the minimum age was 4 years). Cataract was diagnosed in (33.5%) participants. In our study 16.8% were diagnosed with retinal detachment, 9.7% with corneal opacity and 8.1% were diagnosed with Glaucoma. For details see table given below.

**Table 1: Primary Causes of Unilateral Blindness**

| Cause | Frequency | Percentage |
|---|---|---|
| Cataract | 62 | 33.5% |
| RD | 31 | 16.8% |
| Corneal Opacity | 18 | 9.7% |
| Glaucoma | 15 | 8.1% |
| Trauma | 13 | 7.0% |
| DR | 12 | 6.5% |
| CRVO | 5 | 2.7% |
| Phthisis | 3 | 1.6% |
| Optic Neuropathy | 3 | 1.6% |
| ARMD | 2 | 1.1% |
| Others | 21 | 11.4% |
| Total | 185 | 100% |

RD= Retinal Detachment, DR=Diabetic Retinopathy,ARMD= Age Related Macula Degeneration, CRVO= Central Retinal Vain Occlusion, %=percentage

## DISCUSSION

A study was done in Pakistan, national blindness and visual impairment survey of Pakistan,[9] 16507 adults were examined. The leading cause of the blindness was cataract which was found in 51.5% cases. Other causes were 11.8%, by corneal opacity, 8.6% by uncorrected aphakia and glaucoma in 7.1% participants. Other than that, 3.6% blindness was due to posterior capsular opacification (PCO). Refractive Error was diagnosed in 43% participants and was the major cause among the moderately visually impaired which was defined as VA<6/18 to >6/60, followed by cataract which was 42%. Provincial differences were also noted. It was also found that 85.5% of the causes of blindness were avoidable. In our study the results were almost similar because cataract in both studies was identified as the leading cause for blindness. Corneal opacity is 2nd leading cause for blindness in the national blindness and visual impairment survey[9] and in our study it is the 3rd major cause for unilateral blindness.

A study in Oman done on the causes and prevalence of blindness: the Oman Eye Study (OES) was conducted in 1996-7 in which 11417 participants were examined.[10] The estimated prevalence of blindness was 1.1%. In that study the leading cause for blindness was un-operated cataract which was 30.5% and in our study major cause for unilateral blindness was also cataract a percentage of 33.5%. Another study done in Oman in which 12,000 patients were studied, 122 persons presented with no perception of light in one eye (absolute unilateral blindness), a rate of 1.0%. It was found that the onset of blindness was gradual in 63.9% participants. Blindness for more than 10 years in one eye was 54.9%. The main causes of blindness in the study were phthisis/absent/disorganized blind eye which was found in 52.5% participants, glaucoma in 40.2% and corneal opacity in 6.5% cases.[11] There is difference in figures compared with our study, because their study was to determine the frequency of absolute blindness (no perception of light) where in our study the blindness was defined as presenting visual acuity less than 3/60. Another factor can be the sampling population. The main cause of blindness in their study was phthisis/absent/disorganized blind eye (52.5%) and in our study the main cause for unilateral blindness was cataract (33.5%).

A tertiary care hospital study conducted in Douala, Cameroon a total of 1927 cases were recorded as blind among 54,244 consulted patients, corresponding to a prevalence of 3.55%.[12] In that study 1000 participants were bilateral (prevalence

of 1.84%) and unilateral cases were 927, (prevalence of 1.71%). The most common cause for unilateral blindness in their study was cataract followed by glaucoma and retinal detachment. Another study on childhood unilateral blindness was done in Cameroon over a 12 months period in 2008. The aim of this study was to know the causes and prevalence of childhood blindness in school going children aged 6 to 15 years in any one eye. Among the 1266 children included in the study 60 (4.7%) presented with unilateral blindness. In 65% cases, unilateral blindness was due to ocular trauma. Trauma was the leading cause for unilateral blindness because this study was conducted only in children, compared to our study (all age groups were included).

Another study about unilateral and bilateral blindness prevalence and causes: the Copenhagen city eye study, 1000 inhabitants data was collected (aged 60-80 years).[13] Random sampling was done in elderly urban Danish population in 1986-1988. The results were different compared with our study because the Copenhagen city eye study was conducted in elderly population while in our study all age groups were included. Second, the Copenhagen city eye study was conducted in urban population only and in our study there was no such limitation. In that study amblyopia was the main cause of unilateral blindness. Other causes were Age related macular degeneration (ARMD). Diabetic Retinopathy was the third main cause of unilateral blindness.[14] A study done in rural Indonesia on low vision and blindness causes shows results of unilateral low vision. Cataract and refractive error are the most common causes for blindness and the leading causes for unilateral blindness was amblyopia and trauma.[15]

The Patients enrolled in our study were blind due to different pathologies. Results from our study showed 57.3% were male and 42.7% were female. The predominant affection of male gender could be attributed to easy or better accessibility to eye care services for male compared to female. It may be also related to male predominant affection by trauma. The proportion of retinal pathologies (28.1%) for unilateral blindness (RD, DR, CRVO &ARMD) was higher than expectation. This higher percentage was probably related to strength of retina care and its faculty in HMC (HMC is one of the best centers providing care and post-graduate subspecialty training in vitreo-retina). It has six retina consultants providing care for posterior segment pathologies.

Unilateral blindness has socio-economic and psychological effects on patients everyday life. In our study on unilateral blindness 76.2% blindness was treatable e.g. cataract and corneal opacity if diagnosed and treated promptly. Other than that pathologies like glaucoma and diabetic retinopathy are preventable if awareness is spread among community. Screening programs must be done in our community to better deal with the pathologies which are preventable, treatable or rehabilitative. Second facility of surgery should be provided to the patients. Safety, accessible and affordable measures e.g. protective shields, protective goggles, occupational protective gadgets and use of seatbelt can reduce blindness to significant extent.

## CONCLUSIONS

In our study, the main cause of unilateral blindness is cataract. Retinal detachment is the 2nd leading cause for unilateral blindness followed by corneal opacity, glaucoma, trauma, diabetic retinopathy, central retinal vein occlusion, phthisis, optic neuropathy, ARMD and others.

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