

## Blindness Scenario in the Southern Region of Bangladesh

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### Abstract

A cross-sectional, prospective study was conducted in a tertiary level eye hospital in the southern region of Bangladesh, between January and December of 2019, to assess the magnitude of blindness with varying disorders of the eye. All the reported patients irrespective of age and gender were included in this study. Patients were divided into three age groups: 0-25 years, 26-50 years and above 50 years. Demographic variables and eye diseases diagnosed were recorded and analyzed. More than 1.5 lac patients attended the hospital during the study period. Male patients were preponderance 79058 (52.05%) than female 72814 (47.95%). The most common group was above 50 years 75055 (49.42%). Patients related with blindness were 42189 (27.78%). Cataract were the most common disorder of reversible blindness 38662 (91.64%) followed by corneal disorders both reversible and irreversible blindness 1931 (4.57%), and other disorders 1596 (3.78%) with irreversible blindness included ocular trauma, posterior segment disease and glaucoma. Age related cataract (ARC) was 37394 (96.72%) among the patients with cataract, and ARC was found 35272 (83.6%) among the patients related to blindness above 50 years of age. More than 90 percent of the patients 38662 (91.64%) were attended for reversible blindness with cataract. To summarize, age related cataract was the most common cause of reversible blindness among the patients >50 years of age. The causes of irreversible blindness included ocular trauma, corneal ulcer, diabetic retinopathy and glaucoma.

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### Introduction

Blindness is defined as the best corrected visual acuity of less than 3/60 (0.05) or visual field loss in the better eye with the best possible correction. This refers to a loss of walk-about vision.<sup>1</sup> In 2017, the GBD 2015 Study estimated that there were 36.0 million blind people (presenting visual acuity < 3/60) and 216.6 million people with moderate or severe vision impairment (presenting visual acuity <6/18 but  $\geq$ 3/60), with marked geographic variation in prevalence.<sup>2</sup> On January 1, 2016, leaders of the United Nations member countries implemented the sustainable development goal (SDG) agenda up to 2030. The third most important goals of this plan were to ensure healthy lives and promote well-being for all ages.<sup>3</sup>

Recently, World Health Organization (WHO) showed 285 million visually impaired people of all ages in the world, which representing 80% of the

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total health burden globally (WHO, 2017). A joint program of the WHO and the International Agency for the Prevention of Blindness had launched Vision 2020: The Right to Sight in 1999 to eliminate avoidable blindness by 2020.<sup>4</sup> Therefore, an eye health care promotion strategy is needed for eliminating the avoidable blindness. Knowing the degree of eye health and the factors contributing to ill eye health could complement such a strategy. Eye health promotion depends on the knowledge of eye care strategies and diseases pattern in different countries.<sup>5-7</sup> The current study aimed to assess the magnitude of blindness with varying disorders of the eye in a tertiary level eye hospital in the southern region of Bangladesh.

## Methods

A cross-sectional, prospective study was conducted in Sheikh Fazilatunnessa Mujib Eye Hospital & Training Institute, Gopalganj, Bangladesh, between January and December of 2019. Medical records of all patients irrespective of age and sex, who attended the hospital within this period, were reviewed. In outpatient department (OPD) and emergency room, after registration, all the patients were sent for check their vision. Visual acuity (VA) was checked by trained nurses. In every OPD and emergency room, separate patient register was maintained. After an overview of ocular adnexa with torch light, anterior segment examination was done with slit lamp biomicroscope; posterior segment examination was performed after dilating the pupil using direct and indirect ophthalmoscope by an ophthalmologist. Patients diagnosed for medical treatment given at the same time. Patients needed refraction was sent to refraction room, where refraction was performed by ophthalmic medical officer. The patients needed

to check blood pressure (BP) and intraocular pressure (IOP) were sent to another room, where these were done by trained nurses. The age at presentation, sex and clinical diagnosis were determined from OPD and emergency records. The clinical diagnosis was grouped as appropriate diseases. Patients were grouped into three age groups (0-25 years, 26-50 years and above 50 years) and grouped in terms of clinical diagnoses. The data were recorded and analysis was done using SPSS version 26.0. The study was approved by the Ethical Review Committee of Sheikh Fazilatunnessa Mujib Eye Hospital & Training Institute, Gopalganj, Bangladesh.

## Results

A total of 151872 patients were reported in this hospital during this study period. Out of 151872 patients, 149872 (98.68%) patients were evaluated in OPD and 2000 (1.32%) was reported in emergency department. Male patients were preponderance 79058 (52.05%) than female 72814 (47.95%). The most common group was above 50 years 75055 (49.42%). Baseline characteristics of the patients were described in Table-I. Patients related with blindness were 77754 (51.20%) and nonrelated with blindness were 74118 (48.80%). The causes of blindness among the patients attending in this hospital described in relation to diagnosis and gender in Table-II. Regarding the causes of blindness, cataract was the most common 38662 (49.73%) disorder in this study. Among the patients with cataract, age related cataract (ARC) accounted for 96.72% (37394/38662) followed by complicated cataract 2.09% (808/38662), traumatic cataract 0.75% (289/38662) and congenital cataract 0.44% (171/38662). Next to cataract most patients attended in this hospital with reversible blindness due to uncorrected

refractive error 35565 (45.74%). Among these patients most of them were myopic 16004/35565 (45%) followed by hypermetropic 13159/35565 (37%) and astigmatism 6402/35565 (18%). Patients with corneal diseases were the 3rd most common cause of blindness 1931 (2.48%) in this study; among the corneal diseases, 1445 (74.83%) were presented with corneal ulcer followed by corneal scar 486 (25.17%).

Patients with ocular trauma related with blindness were 879 (1.13%). Male was more 624 (71%) then female 255 (29%). Among the ocular trauma, there were 827 (94%) closed and 52 (6%) open eye injuries. Lacerated corneal injuries were the common causes of blindness among the closed eye injuries followed by traumatic hyphaema and burns (thermal and chemical). Among the 52 (6%) open eye injuries, penetrating sclero-corneal injury with or without iris prolapsed was the most common etiology 42 cases (80.77%), followed by ruptured globe 7 (13.47%) and intraocular foreign body (IOFB) 3 (5.76%). Patients with posterior segment disease (vitreo-retina and optic nerve disease) were 425 (0.55%); among the posterior segment diseases most of cases were proliferative diabetic retinopathy (PDR) 107 (25.17%) followed by vitreous hemorrhage 80 (18.82%), retinitis pigmentosa (RP) 56 (13.17%), branch retinal vein occlusion (BRVO) 27 (6.35%), hypertensive retinopathy 26 (6.12%), central retinal vein occlusion (CRVO) 24 (5.65%), anterior ischemic optic neuropathy (AION) 22 (5.18%), retinal detachment (RD) 21 (4.95%), age related macular degeneration (ARMD) 21 (4.95%), macular scar 20 (4.7%), primary & secondary optic atrophy 9 (2.12%), retinoblastoma 7 (1.65%) and central retinal artery occlusion (CRAO) 5 (1.17%). Patients with Glaucoma were 292 (0.37%); Primary angle closure glaucoma

(PACG) was the predominant type 150 (51.37%) followed by primary open angle glaucoma (POAG) 94 (32.2%), lens induced glaucoma 30 (10.27%), neovascular glaucoma 11 (3.77%) and childhood glaucoma 7 (2.39%).

**Table I:** Baseline characteristics of the patients:

| Variable                         | No     | %    |
|----------------------------------|--------|------|
| <b>Gender:</b> Male              | 79058  | 52.1 |
| Female                           | 72814  | 47.9 |
| <b>Age (Y):</b> 00-25            | 27489  | 18.1 |
| 26-50                            | 49328  | 32.5 |
| >50                              | 75055  | 49.4 |
| <b>Area:</b> Rural               | 140730 | 92.7 |
| Urban                            | 11142  | 7.3  |
| <b>Distribution of patients:</b> |        |      |
| Related with blindness           | 77754  | 51.2 |
| Not related to Blindness         | 74118  | 48.8 |

**Table II:** Distribution of patients in relation to causes of blindness.

| Diagnosis                  | Male         | Female       | Total        | %          |
|----------------------------|--------------|--------------|--------------|------------|
| Cataract                   | 20845        | 17817        | 38662        | 49.73      |
| Refractive error           | 17167        | 18398        | 35565        | 45.74      |
| Corneal diseases           | 1078         | 853          | 1931         | 2.48       |
| Ocular trauma              | 662          | 217          | 879          | 1.13       |
| Posterior segment diseases | 233          | 192          | 425          | 0.55       |
| Glaucoma                   | 152          | 140          | 292          | 0.37       |
| <b>Total</b>               | <b>40137</b> | <b>37617</b> | <b>77754</b> | <b>100</b> |

## Discussion

In the present study, 27.78% of patients related with blindness; among them, 54.45% of patients were male and female 45.55%. These findings were close to a study done by Salma *et al.*<sup>8</sup> At a tertiary eye care centre in the western region of Nepal, where 59% were male, and 41% were female. Our study found cataract was the leading cause of blindness (49.73%), followed by uncorrected refractive error (45.74%). Flaxman *et al.*<sup>9</sup> found the leading causes of blindness were

cataracts, uncorrected refractive error and glaucoma; in their study on "Global causes of blindness and distance vision impairment 1990-2020". Age-related cataract was the leading cause of blindness globally in 2015, responsible for an estimated 34.5% of all blindness and 24.1% of moderate and severe vision impairment.<sup>9</sup> There is marked geographic variation in the proportion of blindness attributable to cataracts, ranging from 44.8% in Oceania to 20.0% in high-income North America.<sup>9</sup> Globally, in 2015, uncorrected refractive error was (20.6%) the 2nd most important cause of blindness.<sup>9</sup> In this study, refractive errors were present in 45.74% of cases as 2nd leading cause of blindness. Salma *et al.*<sup>8</sup> found a 19.8% refractive error in their study. Sethi *et al.*<sup>10</sup> found 12.7 %, Onakpoya *et al.*<sup>11</sup> reported 14.3%. Various studies have quoted the refractive error prevalence between 12 to 31%.<sup>10,11</sup> The incidence of refractive error may have been overestimated as it was a hospital-based study. In corneal diseases (2.48%), the microbial corneal ulcer was 74.83%, male 58.86% and female 41.14%. Napaporn *et al.*<sup>12</sup>, in their study on "Etiology and Clinical Outcomes of Microbial Keratitis at a Tertiary Eye-Care Center in Northern Thailand", found male 66.6% and female 33.4% with suspected microbial keratitis. It was reported that the blind schools in Pakistan and India where corneal diseases accounted for 12% and 26.4%, respectively, of all children with severe visual impairment/blindness.<sup>13,14</sup> Salma *et al.* found in their study on under 15 children in western Nepal, corneal and sclera diseases accounted for only 12.4%.<sup>15</sup> In this study, patients with glaucoma were 0.37%, where primary angle-closure glaucoma (PACG) was the predominant type (51.37%), followed by primary open-angle glaucoma (POAG) 32.2%, lens- induced

Glaucoma 10.27%, neovascular glaucoma 3.77% and childhood glaucoma 2.39%. Al Obeidan *et al.*<sup>16</sup> found in their study on 2011 in Saudi Arabia; primary angle-closure glaucoma (PACG) (46.6%) followed by primary angle closure (PAC) (17.2%), then primary open-angle glaucoma (POAG) (12.8%), secondary glaucoma (13%) and other types including (normal-tension glaucoma (5.9%), childhood glaucoma (2.6%), and juvenile glaucoma (1.9%)) were also present but of lower prevalence. Their results were very similar to our study. As the study was carried out during the routine work in hospital, accuracy of data collected had to be limited. The duration of this study was only one year and was thus subject to bias in the sample of eye diseases seen, owing to the epidemic and seasonal nature of common acute ophthalmic diseases.

## Conclusion

The most common causes of blindness for patients attending the hospital were cataracts, while uncorrected refractive errors presented as the second most common cause of blindness. There should be increase the number and quality of cataract surgery to reduce the backlog of enormous number of cataracts in the community for reduces the blindness.

## References

1. Thylefors B, Negrel AD, Pararajasegaram R, Dadzie KY. Global data on blindness. *Bulletin of the world health organization* 1995;73(1):115.
2. Bourne RRA, Flaxman SR, Braithwaite T, *et al.* Magnitude, temporal trends, and projections of the global prevalence of blindness and distance and near vision impairment: a systematic review and meta-analysis. *Lancet Glob Health* 2017;5(9):888-97.

3. United Nations. Sustainable development goals (SDGs). Available from: <http://www.un.org/sustainabledevelopment/health/last> (Accessed November 15, 2019).
4. Pizzarello L, Abiose A, Ffytche T, et al. VISION 2020: the right to sight: a global initiative to eliminate avoidable blindness. *Arch Ophthalmol*. 2004;122(4):615-20.
5. Shrestha MK, Guo CW, Maharjan N, Gurung R, Ruit S. Health literacy of common ocular diseases in Nepal. *BMC Ophthalmology*. 2014;14:2.
6. Islam FM, Chakrabarti R, Islam SZ, Finger RP, Critchley C. Factors associated with awareness, attitudes and practices regarding common eye diseases in the general population in a rural district in Bangladesh: the Bangladesh population-based diabetes and eye study (BPDES). *PLoS One* 2015;10:7.
7. Pan CW, Zhao CH, Yu MB, et al. Prevalence, types and awareness of glaucoma in a multi-ethnic population in rural China: the Yunnan minority eye study. *Ophthalm Physiol Optics*. 2016;36(6):664-70.
8. Salma KCR, Hari T, Malla BA. Clinical profile of pediatric ocular morbidity in a tertiary eye care centre in western region of Nepal. *Ann Pediatr Child Health*. 2015;3(5):1070.
9. Flaxman SR, Bourne RRA, Resnikoff S, et al. Global causes of blindness and distance vision impairment 1990-2020: a systematic review and meta-analysis. *Lancet Glob Health*. 2017;5(12):e1221-34.
10. Sethi S, Sethi M J, Iqbal R, Khan T. Pattern of common eye diseases in children attending outpatient eye department, Khyber Teaching hospital, Peshawar. *J Med Sci* 2008;16:99-101.
11. Onakpoya OH, Adeoye AO. Childhood eye diseases in southwestern Nigeria: a tertiary hospital study. *Clinics (Sao Paulo)* 2009;64:947-52.
12. Tananuvat N, Punyakhum O, Ausayakhun S, Chaidaroon W. Etiology and Clinical Outcomes of Microbial Keratitis at Tertiary Eye-Care Center in Northern Thailand. *J Med Assoc Thai*. 2012;95(4):8-17.
13. Afghani T. Causes of childhood blindness and severe visual impairment survey of blind children from rural population and school for blind in urban area. *Pak J Ophthalmol*. 2003;19:4-25.
14. Rahi JS, Sripathi S, Gilbert CE, Foster A. Childhood blindness in India: causes in 1318 blind school students in nine states. *Eye (Lond)* 1995;9:545-50.
15. Salma KR, Hari T, Malla BA. Clinical profile of pediatric ocular morbidity in a tertiary eye care centre in western region of Nepal. *Ann Pediatric Child Health*. 2015;3(5):1070.
16. Al Obeidan SA, Dewedar A, Osman EA, Mousa A. The profile of glaucoma in a tertiary ophthalmic university center in Riyadh, Saudi Arabia. *Saudi J Ophthalmol*. 2011;25(4):373-9.