

## Study profile of patients of Bundelkhand region Presenting with low vision

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### Abstract

**Background:** Low vision is an important public health problem. The purpose of this study was to describe the characteristics of patients attending the medical college, Jhansi (U.P).

**Methods:** This was a prospective cross sectional study of all new patients seen at the Ophthalmology department, Medical College, Jhansi over a 12 month period. Patients were administered with a structured questionnaire, and were examined and tested with low vision devices by the attending low vision specialist. Information on the demographic and clinical characteristics of the patients was recorded.

**Results:** A total of 150 new patients seen during the period were studied. The mean age was 37.5 years, and their ages ranged between 5 and 80 years with a male to female ratio of 2:1. Patients in the age group of 5-30 yrs were 23.3%, in 26-55 yrs were 35.3% and in 56-80 yrs were 41.3%. The commonest cause of low vision was ARMD (24%); 20% had Corneal opacity; 18% had Optic atrophy; while only 2% had Non specific maculopathy, macular scars, and macular hole. ARMD (17.33%) was the commonest cause in the elderly patients, while amblyopia (6.66%) the commonest in children.

**Conclusion:** The demographic and clinical characteristics of low vision patients seen are similar to that of patients in other developing countries, but different from those in developed countries. Elderly patients and females may be under-utilizing low vision services. There is a need for further research into the determinants of low vision service utilization in developing countries. This would further aid the planning and delivery of services to low vision patients in these countries.

**Keywords:** Low vision, Patient characteristics, Developing countries

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### I. Introduction

Low vision is a condition caused by eye disease, in which visual acuity is 20/70 or poorer in the better-seeing eye and cannot be corrected or improved with regular eyeglasses. (Scheiman, Scheiman and Whittaker). A person with low vision is one who has impaired visual function despite treatment of eye disease and/or correction of refractive error, and has reduced visual acuity in the better eye which is less than 6/18 but better than light perception (LP) or a visual field constriction to less than 10°, but who uses or is potentially able to use vision for the planning and/or execution of a task [1]. This definition of low vision excludes individuals whose visual acuity could be improved by surgical and/or medical treatment and refers to functional vision. The term “functional low vision” has been used to represent this definition in a bid to avoid confusion with other definitions [2-4].

People with functional low vision require assessment for low vision interventions [2], and such patients are the focus of this article. Functionally, low vision is characterized by irreversible visual loss and a reduced ability to perform many daily activities, such as recognizing people in the street, reading blackboards, writing at the same speed as peers, and playing with friends [5]. It is an important public health problem [6]; and provision of low vision services is one of the priorities in the global initiative, VISION 2020—The Right to Sight [2,7]. It is important to collect and analyse clinical data from patients with functional low vision in order to deliver appropriate low vision care. This study is carried out to describe the demographic and clinical characteristics of patients presenting with low vision in our hospital. We believe that the information about patients who actually present to us with low vision clinics would be useful for planning and delivery of effective low vision services.

### II. Method

This was a prospective cross sectional study of all new patients seen at ophthalmology department, M.L.B. Medical College, Jhansi (U.P) between January 2015 and December 2015.

**Study population** Clients who attend the low vision clinic comprise of patients who have been treated at the main eye clinic for various ailments but whose vision needs were not adequately met by conventional methods [1]. Thus, most subjects with operable cataracts were not included in this study. All patients presenting with low vision are seen by an ophthalmologist. All the patients seen during the study period were administered with a structured questionnaire, and were examined and tested with different low vision devices by the attending ophthalmologist. Information on the demographic and clinical characteristics of the patients was recorded. Visual acuity (VA) was assessed with the use of Early Treatment Diabetic Retinopathy Study(ETDRS) charts and recorded in logarithm of the minimum angle of resolution (logMAR) units for distance vision and metric units (M) for near vision. Distance visual acuity of counting fingers, hand motion, light perception(LP) and nil light perception (NLP) were assigned logMAR values of 1.9, 2.3, 2.7 and 3.0 respectively[8-10]. Colour vision was tested by Ishihara's chart.

### III. Results

A total of 150 new patients presented and were seen at the ophthalmology department during the study period. The mean age was (37.5 ) years. Their ages ranged between 5 and 80 years. Majority (66.6%) of the patients were males with a male to female ratio of 2: 1. The age distribution of the patients is shown in Table 1. Thirty five (23.3%) patients were children ( 5-80 years), 53 (35.3%) were aged between 26 -55 years, while 62 (41.3%) of them were elderly patients (56-80 years). The mean age of the male patients was 41.3 years while that of females was 35.7 years[t =1.84; p = 0.067].

**Table 1: Age distribution of low vision patients**

Age group (years)	Frequency (n)	Percent (%)
5 – 30	35	23.3
26 – 55	53	35.3
56 – 80	62	41.3
<b>Total</b>	<b>150</b>	<b>100</b>

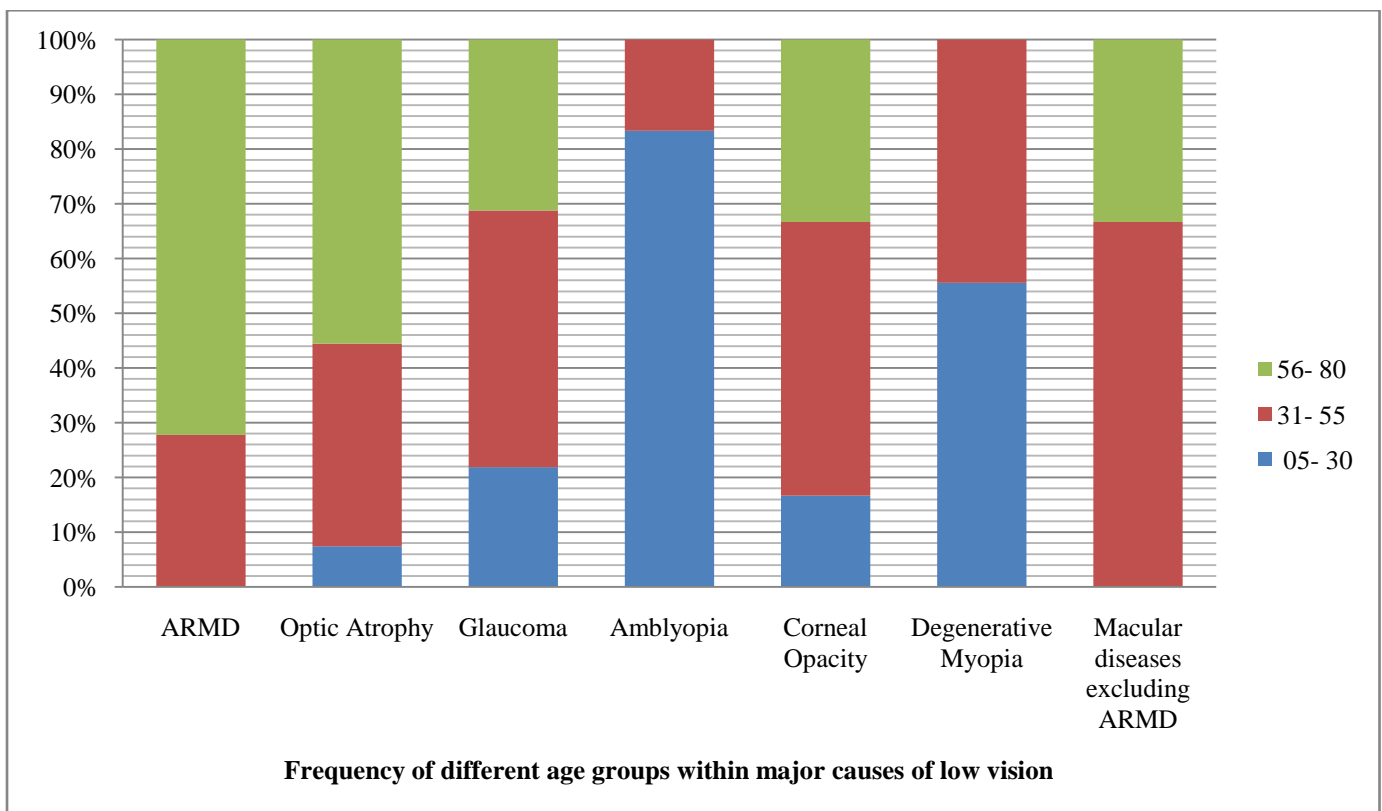
With regards to the main presenting complaint, 103(53.4%) patients complained of both poor distance and near vision indicating that both distance and near vision were of equal importance to them. Thirty nine (20.2%) patients said their major problem was with distance vision, while 38 (19.7%) reported that their main complaint was poor near vision. 30 (20%) patient was mainly concerned about restriction of his visual field. Amongst the patients with poor distance vision as their main problem, 41.0% were children and 7.7% were elderly patients; but among those with poor near vision as their major complaint, only 13.2% were children while 36.8% were elderly patients [ $\chi^2 = 12.89$ ;  $p = 0.002$ ]. The median presenting distance VA in the better eye was 1.20 logMAR with an interquartile range (IQR) of 0.90 – 1.36 logMAR. The median distance VA of the right eyes was 1.30 logMAR (IQR: 1.00 – 1.52); the median for the left eyes was also 1.30 logMAR (IQR: 0.97 – 1.50). The right eye had the better VA in 60 (31.1%) patients, the left eye was better in 54 (28%) patients, while the visual acuity was equal in both eyes of 79 (40.9%) patients. The median near visual acuity was 2.5 Metric units (IQR: 1.25 – 5.00). The median near VA among patients aged 40 years and above was 4.0 Metric units (IQR: 1.60 – 6.30); while in those aged below 40 years it was 2.0 Metric units (IQR: 1.00 – 3.20). Colour vision was normal in 120 (80%) patients, while 30 (20%) patients had nystagmus. The commonest cause of low vision was ARMD in 36(24%) patients. The causes of low vision are presented in Table 2.

**Table 2: Causes of low vision**

Cause of low vision	Frequency (n)	Percent (%)
ARMD	36	24
Corneal opacity	30	20
Optic atrophy	27	18
Glaucoma	27	18
Amblyopia	12	8
Degenerative myopia	9	6
Non-specific maculopathy	3	2
Bilateral macular scars	3	2
Macular hole	3	2
<b>Total</b>	<b>150</b>	<b>100.0</b>

In majority (80%) of the patients the cause of low vision involved posterior segment disease. The commonest causes of low vision among 5-30 year age group were amblyopia and degenerative myopia, each accounting for 8% and 6% respectively. Among the adults aged 31-55 years, the commonest causes were glaucoma and corneal opacities occurring in 10% each of patients. While in the elderly (56-80 years), ARMD (17.33%) was the commonest. The relative frequency of the three different age groups within each of the major causes of low vision is presented in Figure 1.

**Fig 1 : Frequency Of Diff Age Groups Within Major Causes Of Low Vision**



#### IV. Discussion

This study has presented data from a population of low vision patients. A major advantage of low vision clinic studies when compared with population surveys, blind school studies or blind register studies is that they provide more reliable and usually detailed ophthalmic information about people with low vision [11,12]. However, such information may be rather clinic-specific and be strongly influenced by the sources of referral as well as the acceptance and utilisation of low vision services by the population served by the particular low vision clinic. In addition, the sample size of such studies is often limited as was the case in our study. Thus, they are prone to sampling errors and are limited in their extrapolation to the general population [13]. Notwithstanding, the information obtained from such studies can be very useful for planning low vision services, active care and rehabilitation [6]. The age distribution of our patients is different from previous reports from developed countries but is similar to those from other developing countries.

Although the incidence of low vision has been reported to increase with age [12], in our study, a significant proportion (35.3%) of patients were between 26-55 years and majority (41.3%) were above 56 years of age, while least were in 5-30 years. This depiction of a younger population is similar to findings from Malaysia [14], Korea [6], Nepal [15], and India [16] in which the proportion of patients aged below 50 years were 74%, 69%, 58% and 68% respectively. In these developing countries, the proportion of low vision patients aged 60 years and above ranged between 16% and 26%. On the other hand, in studies from developed countries, Leat and Rumney [17] (United Kingdom) found 77% of their patients to be aged 60 years and above; Elliot et al. [11] (Canada) reported that 66% of patients were 70 years or older; while in Australia, Wolffsohn and Cochrane [12] observed that 87% of patients were aged 60 years and above. This difference in the pattern of the age distribution may be a reflection of the older general populations in developed countries [11,14] and low life expectancy in developing countries [16]. Despite this fact, the difference may actually be an indication that the

older population in developing countries are less likely to access and utilise low vision services than those in developed countries as a result of lower literacy and a relative lack of interest in reading. The relatively high male to female ratio in our study is similar to that of other studies conducted in developing countries as follows: Korea- 1.8:1 [6], Malaysia- 2.2:1 [14], Nepal- 2.3:1 [15], and India- 2.6:1 [16]. It is, however, different from the pattern in developed countries where more females were found to present for low vision services [11,12,18]. This probably demonstrates the reduced access and utilisation of eye care services by females in developing countries [19,20]. In our study, however, we found that the proportion of females reduced with age, though this trend was not statistically significant.

Majority of our patients considered their problems with near and distance vision to be of equal importance. However, elderly patients were more likely to deem near vision as being their major problem; while children had a tendency to judge distance vision as more important. This observation perhaps portrays the additional effect of presbyopia on low vision in the elderly, although it may also signify that the elderly have a greater likelihood of central visual loss from macular disease. Posterior segment disease accounted for the majority of causes of low vision in this study. This correlates with findings of most low vision clinic studies [6,11,12,14-17]. In our study, the commonest cause was ARMD which is similar to some previous reports who found age related macular degeneration (ARMD) to be the commonest cause [11,12,17,18]. Besides, there are other reports, specifically from developing countries, in which ARMD was also not the commonest cause [6,14-16]. Possible reasons for lower prevalence of ARMD in developing countries may include nutritional factors, less cigarette smoking, and lower body mass index (BMI) [21]. Further research is required for a better understanding of the role these factors in developing countries. Glaucoma occupied the third position as a cause of low vision in our study population (18%) in contrast to findings of the Nigerian National Blindness and Visual Impairment Survey in which glaucoma was the most common (26.6%) cause of functional low vision [3].

The small sample size of our study may account for this difference. It is thus necessary to educate eye care providers and glaucoma patients about the available options of low vision assessment and low visual aids. Contrary to the previous report by Richard [23] in which cataract was the most common cause of low vision, cataract was not present in our study as were not included. The major causes of low vision within the different age groups as shown in Figure 1 are quite similar to other reports [12,14]. As expected, congenital and heritable conditions were more common in children, while age related diseases were predominant in the elderly patients.

## V. Conclusion

It appears that the demographic and clinical characteristics of low vision patients in our setting are similar to that of patients in other developing countries, but different from those in developed countries. In addition, elderly patients and females may be under-utilising low vision services. We recommend that primary eye care practitioners including optometrists and general medical practitioners in Bundelkhand region and other developing countries should be encouraged to be more mindful about identifying patients with low vision, especially females and the elderly and promptly referring such patients for low vision assessment.

Our study would suggest that the current need for low vision care should be directed at providing support and assistance for adults with age related macular degeneration, corneal opacity, optic atrophy, glaucoma and children with amblyopia and degenerative myopia. More extensive multicentre research on the characteristics of low vision patients as well as the determinants of utilisation of low vision services is necessary to provide more data that would be useful for future planning and delivery of services.

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