



Original Research Article

## Causes of Blindness in the Asokore Mampong Municipality, Ghana

MohammedAbdul-Kabir, Clement Afari, Collins Opoku-Baah, Felix Yemanyi, Samuel Adade, Kwaku Bonsu

Department of Optometry and Visual Science, Kwame Nkrumah University of Science and Technology, Private Mail Bag, Kumasi, Ghana.

Corresponding Author: Collins Opoku-Baah

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### ABSTRACT

**Aim:** To identify the causes of blindness in the Asokore Mampong Municipality in the Ashanti region of Ghana.

**Methods:** A population-based cross-sectional study was conducted from June to August 2011. A stratified cluster sampling of Asokore Mampong Municipality was used to select 460 households. The WHO/PBD standardised survey methodology was used, with suitable adaptation to select subjects who qualified as blind. Selected samples had home interviews and were then invited to have a complete eye examination and interview at a clinic at Asawase.

**Results:** A total of 87 people were found to be blind from the 460 households, blindness being defined according to the WHO Tenth Revision of the International Classification of Diseases. Frequency of blindness increased with age. Females (55.2%) had a higher frequency of blindness than males (44.8%). Asokore Mampong had a higher frequency of blindness (24%) while Aboabo No. 1 recorded the least frequency of 10%. The major causes of blindness were unoperated cataract (35.6%), glaucoma (18.4%), vascular retinopathies (11.5%) and corneal opacities (10.3%).

**Conclusions:** Despite an active eye healthcare programme, especially the public health education on glaucoma and cataract, blindness due to cataract and glaucoma remains a major public health problem in Asokore Mampong Municipality. These results highlight the need, when planning effective intervention strategies, to target the eye healthcare programme to the ageing population, with special emphasis on women.

**Keywords:** blindness, cataract, causes, Asokore Mampong

### INTRODUCTION

Blindness is a major public health issue. Globally, it is estimated that 39 million people are blind with majority living in low income settings and 82% aged 50 and above. <sup>(1)</sup> Cataract is the leading cause of blindness and remains the first cause among all areas except the developed countries in

spite of surgical intervention in the last 10 years. <sup>(2)</sup>

Blindness can decrease a person's ability to perform daily tasks and live independently. Some studies have revealed that quality of life reduces among people with blindness or visual impairment. <sup>(3,4)</sup> Besides that, more burdens in terms of time, cost and effort are placed on society and

government. A recent study estimated that in 2010, the total cost of visual impairment worldwide was \$3 trillion, of which \$2.3 trillion was direct health costs. <sup>(5)</sup>

Fortunately, 80% of all causes of blindness are avoidable. <sup>(1,2)</sup> In 1999, the World Health Organization and the International Agency for the Prevention of Blindness launched a joint initiative: Vision 2020 - the Right to Sight, to eliminate avoidable and treatable blindness by the year 2020. <sup>(2)</sup> Since then, some positive achievements have been realized. For instance, statistics over the last 20 years show that the number of visually impaired persons from infections has reduced. Moreover, specific advancements can be identified in countries such as Brazil, China, Oman, Morocco and India. <sup>(2)</sup> These accomplishments have been attained through activities such as creation of awareness and education on importance of visual function and availability of modern interventions; provision of high quality, available and affordable eye care services and governments established national programmes and regulations to prevent and control visual impairment. <sup>(2)</sup>

In order to facilitate policy setting and prioritization of these eye care programmes, population-based data on the prevalence and causes of blindness is critical. <sup>(1,6-8)</sup> Currently in Ghana, a few population based studies on causes of blindness have been done. However, in the Asokore Mampong Municipality in the Ashanti region of Ghana, there is lack of such data to help in planning and implementation of eye care programmes in line with Vision 2020.

Therefore, this study sought to determine the causes of blindness in the Asokore Mampong Municipality.

## **MATERIALS AND METHODS**

A population based descriptive cross sectional design was used. The study was limited to a descriptive approach of the epidemiology of blindness based on the reported distribution of eye diseases in Asawase. Pre study activities included wide media coverage of the intended survey and its purposes using a popular radio station in the metropolis.

Presenting visual acuity measurement was assessed for each eye separately, using WHO tumbling "E" test card (illiterate Snellenoptotype) or ability to count fingers. The procedure was carried out at 3 metre distance in outdoor light. Testing was carried out with glasses in those using them for distance viewing. In those who could not achieve the 3/60 level, testing was carried out using a pinhole. Blindness was defined according to the WHO tenth revision of the *International Classification of Diseases*. <sup>(9)</sup>

All the participants were subjected to basic eye examination of the eyelids and the anterior segment of the globe. The pupillary reflex was checked and the lens status was assessed using either an ophthalmoscope or a torch light and a magnifying ( $\times 2.5$ ) binocular loupe.

In the second phase of the study, all people considered as blind by the field team after completion of the screening procedures, were transported to the radiant eye centre. There, the referred people were systematically examined by the study ophthalmologists according to the standardised protocol. Visual acuity was reassessed for the confirmation and refraction was performed when necessary. The optic discs, the retinal vessels, and the posterior segment were examined by direct ophthalmoscopy after pupillary dilatation. Intraocular pressure was measured when indicated using an applanation tonometer. Field of vision was tested when applicable.

For each eye, all disorders which were responsible for, or contributed to, visual loss were assessed. A primary cause for the blindness was assigned for each eye. Furthermore, one principal disorder and one principal underlying cause of blindness were assessed for each individual. After considering the existing disorder in either eye, a principal cause responsible for blindness of the person was selected by the study ophthalmologist. In instances of comorbidity where two (or more) disorders were diagnosed, one being secondary to the other, the primary one was considered as the principal cause.

The study followed the tenets of the Declaration of Helsinki. Moreover, informed oral and written consent of the participants and or the head of the family were obtained during the house visit. Those with vision <3/60 due to cataract were advised to take opportunity of the National Health Insurance Scheme to go for surgery, as they stood a higher chance of benefiting from the surgery. Medical treatment for minor eye

ailments such as conjunctivitis and allergies was provided in the field. Those needing further specialised diagnosis or treatment were referred to the regional eye hospital.

## RESULTS

A total of 87 people were identified to be blind based on the criteria for the study; visual acuity worse than 3/60 in the better eye after correction. Table 1 shows the frequency of blindness by age, sex and electoral area among the 87 subjects. Frequency of blindness was clearly related to increasing age, 4.6% for the 0–19 age group, 6.9% for the 20–39 age group, 24.1% for the 40–59 age group, and 64.4% for the group aged 60 and above. A higher frequency of blindness was found in females (55.2%) than in males (44.8%). With respect to electoral area, Asokore Mampong had a higher frequency of blindness (24.1%), followed by Aboabo No. 2 with 19.6%, whilst Aboabo No. 1 recorded the least frequency of 10.4%.

**Table 1. Distribution of blindness by age, sex and electoral area.**

Age	n (%)	Sex	n (%)	Electoral Area	n (%)
0–19	4(4.6)	Female	48(55.2)	New Zongo	(12.6)
20–39	6(6.9)	Male	39(44.8)	Asawase	(18.4)
40–59	21(24.1)	Total	87(100.0)	Aboabo No. 1	(10.4)
60 and above	56(64.4)			Aboabo No. 2	(19.6)
Total	87(100.0)			Adukrom	(14.9)
				Mampong	(24.1)
				Total	87(100.0)

n signifies the number of people found in a particular characteristic while (%) is the corresponding percentage.

**Table 2. Distribution of Causes of Blindness by Sex**

Causes	Males	Females	Frequency	Percentage (%)
Corneal opacities	3	6	9	10.3
Unoperated cataract	13	18	31	35.6
Uncorrected aphakia	0	1	1	1.1
Glaucoma	7	9	16	18.4
Optic atrophy	4	2	6	6.9
Macular degeneration	3	1	4	4.6
Retinal detachment	0	1	1	1.1
Congenital anomalies	0	2	2	2.3
Vascular retinopathies	6	4	10	11.5
Refractive error	2	1	3	3.4
Uveitis	0	1	1	1.1
Disorganised/absent globe	1	2	3	3.4
All causes	39	48	87	100

Table 2 depicts the causes and frequencies of blindness by sex among the 87 people classified as blind for this study. Unoperated cataract accounted for 35.6% of all causes of blindness, while glaucoma blindness accounted for 18.4% and vascular retinopathies for 11.5%. A further 10.3% and 3.4% was as a result of corneal opacities and refractive error blindness respectively. Females predominated in 8 (66.7%) out of the 12 categories of blindness.

## DISCUSSION

The findings of this study add to the few data on the causes of blindness in Ghana and also provide valuable information for policy formulation, prioritization and effective implementation of eye care programmes in line with the goals of Vision 2020.

Age has been associated with blindness. In this study, approximately 89% of the people with blindness were 40 years old and above. Similarly, the Oman Eye Study recorded that 93% of people with blindness were 40 years old and above. <sup>(10)</sup> Blindness is prevalent mostly in older people because age is a major risk factor for conditions such as cataract, glaucoma, vascular retinopathies and macular degeneration <sup>(6)</sup> which have been proven to be the major causes of blindness globally. <sup>(1,11,12)</sup>

Consistent with several studies and meta-analyses of various worldwide studies, this study showed that the proportion of women who had blindness was higher than that of men. <sup>(1,11,13-18)</sup> Even though the difference between the proportions of women and men who were blind in this study was not much, a nearly double prevalence of blindness of women than men was discovered in the Oman Eye Study. <sup>(10)</sup> According to that study, the difference was perhaps due to the greater prevalence of trachoma in women and their lower uptake

of cataract surgeries. <sup>(10)</sup> Another explanation which somewhat may relate to this present study is that women are more likely to be blind because in most communities in the developing countries, women find it difficult to access information and family financial resources needed to cater for costs of eye care or transportation to health centres. <sup>(12)</sup> Keeffe et al <sup>(6)</sup> suggested that the gender difference in the distribution of blindness could be further influenced by the longer life expectancy of women culminating in a continuous increase in the ratio of women to men at old age. While more research should be done to provide evidence-based explanation for this observation worldwide, more attention has to be focussed on balancing the gender inequality in access to information, resources and eye care services in general.

According to the global estimates on visual impairment by Pascolini et al, <sup>(1)</sup> cataract accounted for majority (51%) of blindness in people followed by glaucoma (8%). This study found similar results: cataract (35.6%) and glaucoma (18.4%) were the major leading cause of blindness. While the Oman Eye Study <sup>(10)</sup> recorded a slightly lower rate of 30.5% in cataract causes of blindness, a study done in an urban south Indian population found a higher rate of 57.6%. <sup>(19)</sup> Generally, cataract is the leading cause of blindness in Africa and other developing countries. <sup>(8,10,12,19,20)</sup> The lower rate of cataract as a cause of blindness in the district under study could be due to improved accessibility and availability of surgical interventions by eye care facilities in the district or nearby areas or perhaps, the smaller sample size of blind people in this study.

The result that glaucoma is the second leading cause of blindness in this study (18.4%) is corroborated by other studies done in Tema (Ghana), <sup>(20)</sup> India <sup>(19)</sup> and Oman <sup>(10)</sup> with rates of 20.4%, 13.7%

and 11.5% respectively. Unlike cataract which could be operated and vision restored, glaucoma causes irreversible blindness denoting that lack of early identification and management with strict compliance on the part of the patient could result in permanent loss of vision and its concomitant effects on quality of life. Ghana has been identified as one of the countries with high prevalence of glaucoma. <sup>(20)</sup> This possibly explains the relatively higher rates found in studies done in Ghana than elsewhere. With a potential increase in life expectancy rates and population sizes due to increased availability to general medicine and health services, it is expected that rates of glaucoma causes of blindness could escalate if proactive measures are not put in place. Thus, it is recommended that more planning and prioritization go into eye care programmes geared towards promoting awareness and education of the condition; enhancing accessibility, availability and affordability of glaucoma services and eye care in general, addressing issues of compliance to medication and adherence to follow-ups and providing screening programmes.

Again, highlighting the need for more focus on bridging the gap of gender inequality in access to medical health, information and resources, this study shows that out of the 12 causes identified to cause blindness, female predominated in 8 (66.7%). From the study, there was not much difference between the frequencies of blindness among the various sub areas studied. However, it could be suggested that while a general approach to removing deterrents to eye care services should be employed in all sub areas, a more focussed attention could be given to the Mampong sub area due to its slightly higher frequency.

## CONCLUSION

In conclusion, despite an active eye healthcare programme, especially the public

health education on glaucoma and cataract, blindness due to cataract and glaucoma remains a public health problem of great concern in Asokore Mampong Municipality. These results highlight the need, when planning effective intervention strategies, to target the eye healthcare programme to the ageing population, with special emphasis on women.

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