Awareness and Knowledge of Glaucoma and their Associated Factors among People Visiting a Tertiary Level Hospital in Central Nepal

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ABSTRACT

Background

Glaucoma is one of the major causes of irreversible blindness globally. Almost 60 million people globally are affected by glaucoma making it the second leading cause of blindness worldwide. Diagnosis of glaucoma early on is vital for timely management and prevention of blindness. However, it is challenging to diagnose it early because it is asymptomatic in the initial stage, and there is also the dearth of appropriate screening tools. Awareness, knowledge, and beliefs are believed to influence the treatment-seeking behavior of people as well as their uptake of services.

Objective

To assess the awareness and knowledge about glaucoma among general patients and patient attendants visiting Dhulikhel Hospital.

Method

We conducted a cross sectional quantitative study among general patients visiting Dhulikhel Hospital. We collected data using face-to-face interviews with semi-structured questionnaires. We analyzed data in R version 4.0.3 (2020-10-10). We presented numerical variables as mean and standard deviation whereas categorical variables as frequency and percentage. We determined factors associated with awareness and knowledge of glaucoma using logistic regression analysis and estimated adjusted odds ratio (AOR) with 95% confidence interval.

Result

Of 379 participants, a total of 214 (56.5%) participants had heard about glaucoma. Out of the participants who heard about glaucoma, the mean knowledge score was 48.3±21.7 and 53.3% had good knowledge on glaucoma. The odds of having heard about glaucoma were two percent lower (AOR=0.98; 95%CI: 0.97-0.99; p-value 0.036) in the older participants compared to one year younger participant, 1.98 (95%CI:1.01-3.86; p-value 0.046) times higher among literates and 2.79 (95%CI: 1.76-4.41; p-value < 0.001) times among participants with previous ocular examination. The odds of having good knowledge was 1.94 (95%CI: 1.10-3.42; p value 0.021) times among participants with previous ocular examinations.

Conclusion

The knowledge and awareness regarding glaucoma in a hospital-visiting population in central Nepal was low. Half of the participants were unaware of the disease glaucoma and half of the participants who heard of the glaucoma had poor knowledge on glaucoma.

KEY WORDS

Awareness, Glaucoma, Knowledge

INTRODUCTION

Glaucoma is a common eye disease consisting of atrophy of the optic nerve and progressive loss of vision. It is considered the commonest cause of irreversible blindness in the world.[1] In Nepal, it has been found to be responsible for 1.7% to 5.9% of the total blindness.[2-5] Most glaucoma patients present late because the commonest form of glaucoma 'open-angle glaucoma' has an insidious onset.[6] Previous studies in Africa showed that more than half of glaucoma patients are already blind in at least one eye at presentation.[7-9]

Early detection and prompt treatment are only achieved by timely eye examinations.[8,9] It is thus important to understand the community-level awareness, knowledge and practice regarding glaucoma because that will determine their practices on regular eye examination. A previous study in Nepal investigated the knowledge of glaucoma among eye patients from Eastern Nepal and found that only 5.5% had some knowledge of glaucoma.[10] However, there is no information yet about the knowledge of glaucoma among general people in Nepal. This study therefore aimed to assess the awareness and knowledge regarding glaucoma among the people visiting Dhulikhel Hospital, a tertiary-level hospital in central Nepal. Dhulikhel Hospital is the only tertiary-level hospital for the people from Kavrepalanchowk, Sindhupalchowk and Sindhuli districts. Hence, we believe that the participants represent the population from these and the surrounding districts.

This information can be of significant value when planning health education campaigns related to glaucoma and can benefit other blindness prevention activities in this population.

METHODS

We conducted a cross-sectional quantitative study in the out-patient clinic of the Department of Ophthalmology at Dhulikhel Hospital from April 2021 to July 2021. Dhulikhel Hospital is a tertiary hospital that serves a catchment population of almost 2.3 million from the districts of Kavre, Sindhupalchowk, Bhaktapur, Sindhuli, Ramechhap and other neighboring areas.

The trained research staff approached patients and their attendants waiting at the out-patient department. Those who met eligibility criteria were recruited into our study. The inclusion criteria included a) those 18 years and above, b) those who agreed to participate in the study and gave written informed consent.

We obtained ethical approval from the Institutional review committee (IRC) of Kathmandu University School of Medical Sciences. We assured voluntary participation of all participants. We maintained confidentiality and anonymity of all participants throughout the study.

The sample size was calculated using Cochran's formula assuming a prevalence of awareness of glaucoma at 27%, based on the study by Maharana et al. 5.0% absolute error and 5% level of significance.[11,12] Our calculated sample size was 303. However, we recruited 379 patients conveniently.

Trained staff collected data using face to face interviews using study instruments. Study instrument consisted of four components socio-demographic characteristics, awareness of glaucoma, level of knowledge about glaucoma, and practices with regard to glaucoma screening.

Socio-demographic characteristics included age(in years), gender(male/female), education (literate/illiterate) and previous ocular examination (yes/no).

Awareness of glaucoma was defined as "having heard of glaucoma'' when they were asked if they had ever heard of glaucoma.

The knowledge regarding glaucoma was assessed on the basis of the responses to a set of questions (14 questions) related to the information on glaucoma. The correct answers were coded one and incorrect were coded as zero. The total number of correct answers was divided by the number of responded questions and multiplied by 100 to calculate the score. Those participants who scored more than or equal to mean score were considered as having good knowledge and those who scored less than mean score were considered as having poor knowledge.

We entered paper based collected data into Microsoft Excel and imported it into R version 4.0.3 (2020-10-10) for cleaning, coding and statistical analysis. We presented parametric numerical variables as mean and standard deviation, categorical variables as frequency and percentage. We used univariate and multivariate logistic regression to determine association of age, gender, education and previous ocular examination with awareness and knowledge of glaucoma. We determine crude odds ratio (COR), adjusted odds ratio (AOR) and their 95% confidence interval (CI).

RESULTS

A total of 379 general patients visiting Dhulikhel Hospital were enrolled in the study. Table 1 presents the socio-demographic characteristics of the study participants. The age of the participants ranged from 14 to 87 years with the mean age of 40.9 ± 15.6 years. Of total participants, 54.4% were males and 85.2% were literate.

Awareness, Examination and Family History of Glaucoma

A total of 214 (56.5%) participants had heard about glaucoma whereas 165 (43.5%) had not heard about it (Table 2). The most important sources of information of glaucoma were from media (television, radio, newspaper) and through hospital-based or health camp settings.

Table 1. Sociodemographic Characteristics of the Participants (n=379)

Characteristics	n (%)
Age (in years), mean±SD, min; max	40.9 ± 15.6, min: 14.0; max: 87.0
Gender	
Female	173 (45.6)
Male	206 (54.4)
Education	
Literate	323 (85.2)
Illiterate	56 (14.8)

n: frequency; %: percentage

Table 2. Awareness, examination and family history of glaucoma

Characteristics	n (%)
Ever heard of glaucoma (n=367)	214 (56.5)
Ocular examination in the past one year (n=367)	148 (40.3)
Positive family history of glaucoma (n=214)	10 (4.7)
Source of Information	
TV/radio/newspaper (n=200)	96 (48.0)
Hospital/Health camp (n=204)	100 (49.0)
Family/Friends (n=192)	37 (19.3)

n: frequency, %: percentage

Table 3. Association of awareness of glaucoma with sociodemographic factors

Variables	Awareness about glaucoma, n(%)	COR (95% CI)	p-value	AOR	p-value
Age (in years)		0.98 (0.97-0.99)	0.013	0.98 (0.97-0.99)	0.036
Gender					
Female	93/173 (53.8%)	1		1	
Male	121/206 (58.7%)	1.23 (0.81 - 1.84)	0.330	1.03 (0.66-1.61)	0.887
Education					
Illiterate	22/56 (39.3%)	1		1	
Literate	192/323 (59.4%)	2.27 (1.27-4.05)	0.006	1.98 (1.01-3.86)	0.046
Ocular examination in past					
No	106/219 (48.4%)	1		1	
Yes	104/148 (70.3%)	2.52 (1.62-3.92)	0.000	2.79 (1.76-4.41)	< 0.001

n: frequency, %: percentage; COR: crude odds ratio; AOR: adjusted odds ratio; CI: confidence interval

Table 3 depicts the association of awareness of glaucoma with the selected socio-demographic factors. Age, education level and previous ocular examination were significantly associated with awareness of glaucoma in multivariate logistic regression. The odds of having heard about glaucoma were two percent lower [AOR=0.98 (95%CI: 0.97-0.99); p-value 0.036] in the older participants compared to one year younger participant after adjusting for gender, education and previous ocular examination. The odds of being aware of glaucoma was 1.98 (95%CI:1.01-3.86; p-value 0.046) times higher among literate participants and 2.79 (95%CI: 1.76-4.41; p-value < 0.001) times among participants with previous ocular examination in multivariate logistic regression analysis.

Regarding knowledge of glaucoma among study participants, only 24.1% of the participants said that glaucoma might be asymptomatic (Table 4). About 78.1% participants said that it is a different condition than cataract. The mean score of knowledge was 48.3 ± 21.7. Out of the participants who heard about glaucoma, 114 (53.3%) had good knowledge and 100 (46.7%) had poor knowledge.

Table 4. Knowledge about Glaucoma among participants who heard about glaucoma

Question	n	Yes, n(%)	No, n(%)	Don't know, n(%)
Glaucoma is always symptomatic	178	131 (73.6)	47 (26.4)	
Symptoms of Glaucoma				
Decrease peripheral vision	122	83 (68.0)	39 (32.0)	
Pain in the eyeball	119	35 (29.4)	84 (70.6)	
Redness of eye, watering of eye	121	46 (38.0)	75 (62.0)	
Discharge in eye	117	25 (21.4)	92 (78.6)	
Increases pressure in eye	211	78 (37.0)	43 (20.4)	90 (42.7)
Damages to the nerve of eye due to increase in eye pressure	212	93 (43.9)	40(18.9)	79(37.3)
Damages to retina	213	89 (41.8)	61(28.6)	64(29.6)
Risk of Glaucoma increases with age	213	117(54.9)	29(13.6)	67(31.5)
Glaucoma has familial predisposition (runs in family)	212	108(50.9)	31(14.6)	73(34.4)
Glaucoma has asymptomatic course	212	105(49.5)	51(24.1)	56(26.4)
Vision is affected in early course	198	81(40.9)	87(43.9)	30(15.2)
Glaucoma is same as cataract	201	25(12.4)	157(78.1)	19(9.5)
Blindness from glaucoma is irreversible?	200	100(50.0)	62(31.0)	38(19.0)
Blindness from Glaucoma is preventable?	200	61(30.5)	100(50.0)	39(19.5)
Treatment of Glaucoma is possible?	202	159(78.7)	28(13.9)	15(7.4)

n: frequency, %: percentage

Table 5 highlights the association of knowledge on glaucoma with various socio-demographic characteristics based on multivariate analysis. The good knowledge of glaucoma among participants was significantly associated with the presence of previous ocular examination. The odds of having good knowledge was 1.94 (95%CI: 1.10-3.42; p-value 0.021) times among participants with previous ocular examination compared to those who had no previous ocular examination.

Table 5. Association of knowledge of glaucoma with socio-demographic factors

Variables	Good knowledge, n(%)	COR (95% CI)	p-value	AOR	p-value
Age (in years)		0.98 (0.96-0.99)	0.042	0.99 (0.97-1.00)	0.132
Gender					
Female	46/93,(49.5)	1		1	
Male	68/121,(56.2)	1.31 (0.76-2.26)	0.328	1.12 (0.63-1.99)	0.714
Literacy					
Illiterate	8/22, (36.4)	1		1	
Literate	106/192,(55.2)	2.16 (0.87-5.38)	0.099	1.81 (0.67-4.88)	0.243
Ocular examination in past					
No	49/106, (46.2)	1		1	
Yes	63 /104, (60.6)	1.78 (1.03-3.09)	0.038	1.94 (1.10-3.42)	0.021

n: frequency, %: percentage; COR: crude odds ratio; AOR: adjusted odds ratio; CI: confidence interval

Among those who said that the treatment of glaucoma is possible, around two third identified eye drops and eye surgery as the possible treatment and very few (10%) know about laser treatment of glaucoma (Table 6).

Table 6. Knowledge regarding treatment of Glaucoma (among those who said treatment of glaucoma is possible, n=159)

Possible Treatment (n=159)	n	Yes, n(%)	No , n(%)
Eye drops	147	58 (39.5)	89(60.5)
Laser treatment	141	14 (9.9)	127 (90.1)
Eye Surgery	97	64(66.0)	33(34.0)
If not treated			
Blindness	97	68(70.0)	29(30.0)
Eye damage	83	21(25.3)	62(74.7)

n: frequency, %: percentage
Note: the total count for each variable does not matched to total due to presence of missing data

DISCUSSION

This study investigated the level of awareness and knowledge of glaucoma among the general public, identified as the patients and patient attendants visiting Dhulikhel Hospital.

Dhulikhel Hospital is a tertiary hospital that serves a catchment population of almost 2.3 million from the districts of Kavre, Sindhupalchowk, Bhaktapur, Sindhuli, Ramechhap and other neighboring areas. The patients visiting the hospital are primarily from these areas. Although not a representation of the whole country we believe that this study provides a critical insight on the knowledge gap in relation to glaucoma among Nepalese adults.

This study found that the level of awareness of glaucoma was low (56.5%) in the study population and the awareness was positively associated with age, education and previous ocular examination. This is similar to the study conducted in Eastern Nepal in which, among 211 study participants visiting eye camp, only 60.6% had heard about glaucoma. The awareness of glaucoma was significantly associated with higher levels of education, family history of glaucoma, and previous history of eye check up.[10] However, the awareness level of our participants was much higher than the community-based population in Bhaktapur, where only 2.43% had awareness on glaucoma.[3] This might be because the present study and the study on Eastern Nepal were done in a hospital setting and hence proportionately more aware people might have been represented unlike the community-based setting in Bhaktapur. Both of these studies conducted in Nepal, concurred with our findings showing significant association between age and awareness of glaucoma. This can be explained by the fact that glaucoma is more prevalent in elderly age and hence this age group might have had more experience or exposure regarding the disease.

As predicted, education level remains a significant factor of awareness.[13] Literate patients were significantly more likely than illiterate patients to be aware of glaucoma in this study. This conclusion is similar to a study conducted in Nigeria, who found that respondents with a higher educational level were more likely than those with a lower educational level to indicate knowledge of glaucoma.[14]

Glaucoma is one of the most important preventable causes of blindness and because of its asymptomatic status for a long period, the only effective way to prevent blindness due to glaucoma is timely screening. It has been established that one of the main reasons for the late presentation of glaucoma is inadequate awareness.[15,16] This leads to increased risk of blindness.[17] Hence, this low level of awareness in our study is alarming. This mandates a wider community-based awareness program and regular screening program for targeted populations in the communities.

The findings of knowledge regarding glaucoma was also low in this study. The mean percentage of correct answers for this study was 48.3 (SD:21.7). This is one of the first studies that dissects the knowledge on various aspects of glaucoma in the study participants. Whereas, majority of the patients 78% were correct in knowing that glaucoma is a separate condition than cataract, only 49.5% patients mentioned that glaucoma might be asymptomatic. This is an important finding and highlights the concerning lack of knowledge regarding the most important aspect of glaucoma. It is not surprising thus that people might present generally with a late stage of glaucoma when the eyes have suffered irreversible and extensive damages. Past studies have highlighted that 50 - 90% of the glaucoma cases remain undiagnosed and a large number of cases are diagnosed at later stage of the diseases.[18-20]

The importance of improving global awareness on glaucoma is more important than ever because of the increasing life expectancies all around the world, with an expected rise in the number of glaucoma cases. It will thus continue to remain as one of the top three irreversible blindness in the world.[21,22] With timely screening and prompt treatment, almost 90% of glaucoma related blindness can be prevented or treated.[22,23] Knowledge and awareness about glaucoma and its risk factors directly impacts the health care seeking behavior among patients.[22,24] Our study underscores the need for a greater community wide awareness campaign on glaucoma and also community based programs focused on glaucoma screening.

CONCLUSION

This is one of the first studies in Nepal that investigated the awareness and knowledge regarding glaucoma. Almost half of the participants were unaware of glaucoma and among those aware about it, only half had a good understanding of glaucoma. This study highlights an urgent need to organize community level awareness and systematic screening plans of glaucoma in Nepal.

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