Awareness of cataract and glaucoma in a population of Nepal
The Bhaktapur Glaucoma Study

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Emails adds of all
Abstract

**Background:** To determine the awareness of cataract and glaucoma among subjects residing in Bhaktapur district of Nepal.

**Methods:** A total of 11499 subjects more than 40 years of age residing in Bhaktapur district underwent a structured interview regarding awareness (heard of) and knowledge (understanding of the disease) of cataract and glaucoma. The interview was taken by trained investigators while conducting the community field work of the Bhaktapur Glaucoma Study.

**Results:**
Awareness of cataract (6.7%) and glaucoma (2.4%) was very low. The knowledge of cataract and glaucoma was also poor. Among subjects who were aware, 70.38% subjects had knowledge of cataract and 42.5% of glaucoma. The common knowledge of cataract was a ‘pearl like’ white appearance in the eye (62.2%) while of glaucoma, it was blindness (26.49%). Multivariate analysis revealed that the awareness remained unchanged in different age groups of cataract while of glaucoma there was an increase in awareness except in the highest age group. Women were significantly less aware (odds ratio (OR): 0.63; 95%, confidence interval (CI): 0.54 -0.74) for cataract and (OR: 0.64; 95% CI: 0.50 -0.81) for glaucoma. Literacy played a significant role in awareness. Media was the major source for awareness of the eye diseases.

**Conclusion:** Awareness and knowledge of cataract and glaucoma is very poor in this population. The importance of health education has to be addressed in order to reduce visual impairment and blindness from common eye diseases in Nepal.

**Keywords:** eye diseases, cataract, glaucoma, awareness, knowledge, epidemiologic studies, Bhaktapur, Nepal.
Background

Implementing health care programs in the community and promoting awareness of common eye diseases can bring forth people for an eye examination. This could result in the early diagnosis and treatment of eye diseases and prevention of visual impairment and blindness.

Cataract is the major cause of blindness worldwide. It is estimated that 41.8% of all global blindness is caused by cataract (1). Glaucoma is the second leading cause of visual loss in the world. Quigley estimates that there will be 60.5 million people with glaucoma in 2010 and Asians are expected to represent 47% of those with glaucoma (2).

Studies undertaken in the region have revealed a poor awareness of eye diseases in the general population (3, 4, 5). It has also been reported that approximately 50% of patients with glaucoma were unaware of their condition at the time of diagnosis (6) and presented in the advanced stage of the disease (7, 8). Studies on awareness, knowledge and beliefs on glaucoma in developed countries have also reported that 7-70% of the participants were unaware of glaucoma (9-15).

This study was conducted to determine the awareness and knowledge of cataract and glaucoma in Bhaktapur district. To the best of our knowledge, this is the first population-based data on awareness of cataract and glaucoma in a Nepalese population.

Materials and Methods

Bhaktapur is one of the three districts of Kathmandu valley which represents a metropolitan city with surrounding rural areas. It is situated approximately 15 kilometers from Kathmandu the capital city of Nepal.

The Bhaktapur Glaucoma Study (BGS) is a cross sectional population based study designed to determine the prevalence of glaucoma in Bhaktapur district. A sample size of 4758 was calculated after assuming a prevalence of 3% for glaucoma, a relative precision of 25%, 85% compliance and a design effect of 2. The survey involved the selection of 4800 subjects that were 40 years and above, using a WHO 30 cluster sampling procedure (16). In the first stage of sampling, a list of all the wards or clusters from 16 Village Development Committees and 2 municipalities in the district was obtained from the 2001 Nepal national census data (17). These clusters were arranged in order of population size and 30 of these clusters were sampled with probability proportionate to the size. Field workers conducted a house to house census in the selected clusters to prepare an eligibility list. Households were eligible to participate in the survey if it had at least one member above 40 years of age. For the second stage sampling, a database was prepared where the names of eligible subjects were recorded. From this database, 4800 subjects were selected by using EPI-INFO software, version 3.5.1. The selected subjects were then revisited by the community field staff and referred to Tilganga Institute of Ophthalmology (TIO) for a comprehensive eye examination.
Six community field workers interviewed 11,499 subjects that were enlisted on the field during the filed work of BGS. This part of the study was conducted from July to December 2006. The community field workers were trained in the interview procedures by the principal investigator. A structured-interview, regarding awareness for cataract and glaucoma was taken and responses documented. The questionnaire was first designed in English and then later translated into Nepali, the national language of Nepal. A pilot study was conducted on volunteers and minor modifications were later made to finalize the interview questionnaire. Subjects were asked if they had heard of cataract and glaucoma. Those that responded with a ‘yes’ were termed as being ‘aware’ and were further encouraged to explain what they had known about the condition. Subjects with responses that matched to the list of answers in the questionnaire were regarded to have ‘knowledge’ of the eye diseases. All responses were documented. Demographic details of were documented and subjects were termed as illiterate if they were not able to read or write.

Statistical analyses were performed using STATA 9.0. The demographic associations of awareness of cataract and glaucoma with age, gender, caste and literacy were assessed by univariate analyses followed by multivariable logistic regressions.

Results

Out of a total of 11,499 subjects that were interviewed complete data was available for 10,303 subjects. In this group 52.32% were males, 61.48% were illiterate and 69.65% belonged to the Newar caste. 55.8% of the total subjects had never undergone an eye examination.

A total of 682 (6.7%) of the subjects were aware of cataract while 244 (2.43%) of glaucoma. Multivariate logistic regression analyses (Table 1) indicated that awareness of cataract did not increase considerably with the increase in age group while for glaucoma the awareness increased significantly except for subjects in the highest age group. For both cataract and glaucoma awareness was more in the male sex, literates and in the Brahmin and Chhetri ethnic castes.
Table 1: Association of awareness of cataract and glaucoma with age, sex, literacy and caste

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total number</th>
<th>Num aware of Cataract (%)</th>
<th>OR for being aware of Cataract (95% C.I.)</th>
<th>Num aware of Glaucoma (%)</th>
<th>OR for being aware of Glaucoma (95% C.I.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs.)a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40 – 49</td>
<td>4032</td>
<td>328 (8.1)</td>
<td>1.00</td>
<td>118 (2.9)</td>
<td>1.00</td>
</tr>
<tr>
<td>50 – 59</td>
<td>2707</td>
<td>181 (6.7)</td>
<td>1.02 (0.84 1.25)</td>
<td>81 (3.0)</td>
<td>1.38 (1.02 1.85)</td>
</tr>
<tr>
<td>60 – 69</td>
<td>1931</td>
<td>106 (5.5)</td>
<td>1.02 (0.80 1.30)</td>
<td>53 (2.7)</td>
<td>1.65 (1.16 2.35)</td>
</tr>
<tr>
<td>≥ 70</td>
<td>1633</td>
<td>67 (4.1)</td>
<td>0.97 (0.73 1.30)</td>
<td>16 (1.0)</td>
<td>0.78 (0.45 1.35)</td>
</tr>
<tr>
<td>Sexb</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>4912</td>
<td>398 (8.1)</td>
<td>1.00</td>
<td>157 (3.2)</td>
<td>1.00</td>
</tr>
<tr>
<td>Female</td>
<td>5391</td>
<td>284 (5.3)</td>
<td>0.63 (0.54 0.74)</td>
<td>111 (2.1)</td>
<td>0.64 (0.50 0.81)</td>
</tr>
<tr>
<td>Literacyc</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Literate</td>
<td>3968</td>
<td>499 (12.6)</td>
<td>1.00</td>
<td>215 (5.4)</td>
<td>1.00</td>
</tr>
<tr>
<td>Illiterate</td>
<td>6335</td>
<td>183 (2.9)</td>
<td>0.23 (0.18 0.28)</td>
<td>53 (0.8)</td>
<td>0.15 (0.10 0.21)</td>
</tr>
<tr>
<td>Caste d</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brahmin/Chhetri</td>
<td>2396</td>
<td>383 (16.0)</td>
<td>1.00</td>
<td>161 (6.7)</td>
<td>1.00</td>
</tr>
<tr>
<td>Newar</td>
<td>7177</td>
<td>230 (3.2)</td>
<td>0.22 (0.18 0.26)</td>
<td>87 (1.2)</td>
<td>0.23 (0.18 0.30)</td>
</tr>
<tr>
<td>Others</td>
<td>730</td>
<td>69 (9.4)</td>
<td>0.71 (0.54 0.94)</td>
<td>20 (2.7)</td>
<td>0.55 (0.34 0.89)</td>
</tr>
</tbody>
</table>

a, b, c, d, e  p < 0.001 for cataract and glaucoma each, χ² test in univariate analysis

Responses to questions on cataract and glaucoma are presented in Table 2. Of the 682 subjects who were aware of cataract, 480 (70.38.0%) also had knowledge of the condition. 423(88.12%) out of the 480 subjects had knowledge that cataract was as an appearance of a 'pearl like' white opacity in the eye. Of the 268 subjects who were aware of glaucoma, 122(45.52%) subjects had knowledge of the condition. 71(58.19%) subjects out of the 122 had known that glaucoma could cause blindness.

Media was the most frequent source of information for both cataract (39.7%) and glaucoma (40.3%).

Table 2: Responses among those aware of cataract and glaucoma

<table>
<thead>
<tr>
<th>What is Cataract?</th>
<th>Number (%)</th>
<th>Source of information</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cataract</td>
<td>Glaucoma</td>
<td>Cataract</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Family member</td>
<td></td>
</tr>
<tr>
<td>Blurred visiona</td>
<td>48 (7.0)</td>
<td>18 (6.7)</td>
<td>86 (12.6)</td>
</tr>
<tr>
<td>Blindnessb</td>
<td>6 (0.9)</td>
<td>71 (26.5)</td>
<td>91 (13.3)</td>
</tr>
<tr>
<td>Pearl like opacityc</td>
<td>423(62.0)</td>
<td>3 (1.1)</td>
<td>69 (10.1)</td>
</tr>
<tr>
<td>Rainbow haloesd</td>
<td>3 (0.4)</td>
<td>22 (8.2)</td>
<td>107 (15.7)</td>
</tr>
<tr>
<td>Raised eye pressure</td>
<td>0 (0.0)</td>
<td>8 (2.9)</td>
<td>271 (39.7)</td>
</tr>
<tr>
<td>Unmatched answers</td>
<td>202 (29.6)</td>
<td>146 (54.5)</td>
<td>58 (8.5)</td>
</tr>
<tr>
<td>Total</td>
<td>682 (100)</td>
<td>268 (100)</td>
<td>682 (100)</td>
</tr>
</tbody>
</table>

a, b, c, d, e considered as knowledge
Discussion

Awareness of cataract and glaucoma was very poor in this population. There were more subjects who were aware of cataract than glaucoma. This difference was probably due to cataract being a more common condition occurring in an elderly population. No considerable difference in awareness was noted between age groups for cataract while a significant difference was seen for glaucoma. The female sex was significantly less aware of both conditions. This is possibly due to unequal access to eye care. Literacy also played a significant role in awareness. Those who were illiterate were less aware of cataract and glaucoma which was similar to some reports from other countries (18, 19, 20). It was not surprising to find the Brahmin and Chettri castes to be more aware than the rest since they are more affluent and literate. Previous studies on cataract surgery undertaken in Nepal (21) and south India (22) have also reported that males, literates and those affluent were more likely to be aware of cataract surgery.

Knowledge regarding both conditions was very poor as well. Subjects mostly understood cataract as a ‘pearl like’ white appearance in the eye while glaucoma was known to cause blindness. Very few had knowledge of glaucoma as a disease of eye pressure. The major source of awareness for cataract and glaucoma was through the media.

Majority of the subjects (55.8%) had never undergone an eye examination. This population therefore has to be encouraged to undertake an eye examination because blindness from diseases such as glaucoma can be prevented through early detection.

Bhaktapur district which adjoins the capital city Kathmandu has better health care infrastructure, education system and socioeconomic conditions when compared to other districts of Nepal. A poor awareness of glaucoma was expected taking into consideration the nature of the disease and a lower incidence when compared to cataract. However we are fairly alarmed to find a very poor awareness of cataract as well. We are unable to explain the reason for such a low awareness on cataract despite there being several cataract screening programs that have been held in the past several years in Bhaktapur.

Patient education programs in developed countries have been successful in decreasing the morbidity of diseases (23, 24). Patient education has also helped improve compliance in glaucoma patients (25). A novel approach to screening and patient education has been adopted by TIO to promote awareness, screening and follow up of patients, the results of which are promising (26).

Nepal is an under developed, predominantly rural and a mountainous country. Majority of the population of Nepal live in rural areas and are farmers by occupation. The Nepal Blindness Survey conducted in 1981, estimated glaucoma to be one of the major causes for blindness following blindness caused by cataract and corneal diseases (27). Nepal has a poor healthcare infrastructure with difficult means for acquiring information on diseases. Thus we expect the level of awareness to be even lower in other districts of Nepal. In the future patient education programs and awareness activities need to be held
more frequently in various parts of the country in order to reduce visual impairment and blindness from common eye diseases in Nepal.

Authors have no competing interests.

Author’s contribution

PP: helped design the study and questionnaire
PI: paper writing
TSN helped in the field work and interpretation of results
MN: helped in data analysis
KS: helped in data analysis
GHMBVR: Overall guidance
References:


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