Original article

# Blinding Trachoma among Adults of Abeshge and Kebena districts, Gurage Zone, in Ethiopia

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**Abstract**

**Objective**: To determine the prevalence of trachomatous trichiasis (TT) and corneal opacity (CO) among adults within Abeshge and Kebena Districts in Gurage Zone.

**Methods:**-Community-based cross-sectional blinding trachoma survey was designed for the study. Random, multistage sampling of the inhabitants over 40 years of age, from villages in the Abeshge and Kebena Districts was performed; 1100 eligible participants were identified for the study. Visual acuity was measured using a Snellens E chart at 6 meters. Eyelid, eye lashes, ocular surface, and anterior segment examinations were performed using torch light and 2.5x magnifying loupe. Trachoma was graded as trachomatous trichiasis (TT) or Corneal Opacity (CO) according to the World Health Organization grading system.

**Results:** The population-based prevalence of blinding trachoma (TT and/or CO) was 6.6% (95% confidence interval [CI] (5.13%, 8.07 %). Women had more blinding trachoma (10.4%) than men (2.8%) (P<0.001).

**Conclusion:** The prevalence of blinding trachoma in Gurage Zone is found to be high and one of the major public health problems. This demonstrates the need for Trachoma surgical service and health education program. [*Ethiop.J.Health Dev.* 2009;23(1):68-72]

## Introduction

Trachoma is a chronic keratoconjunctivitis caused by Chlamydia trachomatis. It is a communicable disease transmitted through fingers, fomites and flies. It has led to conjunctivitis, cicatricial lid changes, and corneal opacity (CO) among populations who have been socio-economically disadvantaged and those who have been exposed to hot, dry, and dusty environments without adequate access to water and facial hygiene (1). Trachoma has been a major cause of blindness for many centuries. Although its prevalence in some areas is declining, trachoma continues to account for at least (3%) 1.3 million people of world blindness, making it one of the leading causes of preventable blindness (1,2). The 2006 National Survey of blindness in Ethiopia has shown that trachoma is endemic in many parts of Ethiopia, accounting for 11.5% of the blindness and 7.7% of low vision in the country. The national prevalence of TT is 3.1% (3). It is estimated that trachoma has blinded more than 138,000 Ethiopians (4).

Surgery, antibiotics, facial cleanliness, and environmental improvement strategy not only has proven effective in reducing the prevalence of active infection and potentially blinding trachoma-related trichiasis and CO, but also has been accompanied by a decline in the incidence of trachoma related blindness and visual impairment (5,6).

An understanding of the magnitude, geographical distribution and causes of blindness within the community is crucial to the design and evaluation of an effective intervention programs. Accurate epidemiologic data of this nature are critical to optimize the allocation of limited health care resources and assess the effect of ongoing treatment strategies. Here, we present data from the Abeshge and Kebena districts of Gender and Blindness study and describe the prevalence of trachoma-related trichiasis (TT) and Corneal Opacity (CO) among adult population randomly selected from the Gurage Zone.

## Methods

### *Sampling Procedure*

The study was a population-based, cross-sectional ophthalmic survey of the inhabitants of rural villages in central Ethiopia, Abeshge and Kebena districts. The principal aim of this study was to assess gender difference in the prevalence and causes of visual impairment among persons of over 40 years of age in this area. As part of this study, the prevalence of trachoma-related trichiasis, CO, and visual impairment were recorded.

Abeshge and Kebena districts are located 1800m above see level, 150-160 km south west of Addis Ababa, Ethiopia, in the Gurage Zone of the Southern Nations Nationalities and Peoples Region (SNNPR). They had a population of 52,989 and 63,162 respectively with those above 40 years of age making 20,907 (18.0%). Participants were selected using a random, multistage cluster sampling process. Abeshge District has 26 Kebeles and Kebena District has 23 Kebeles served by a centrally located two health centers providing primary eye care service. Each kebele is further divided into villages. Five kebeles were randomly selected from each district. Three villages were randomly selected from each kebele. All adults 40 years old and above residing in the selected villages (for at least the past 2 months) were considered eligible for the study. (kebeles are the smallest

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administrative units in Ethiopia with a population of 2000-5000).

Sample size was calculated based on the following assumptions: The prevalence of blindness (VA < 3/60) estimated for adults 40 years old and above to be 7.9%. We assumed confidence interval of 95%, 80% power for the study, 5% type I error and odds of being blind among women is 1.8 times higher than men. The calculated sample size was 1066 persons (533 for each sex). Interviewers were recruited and trained on how to fill the questionnaire.

***Data Collection***

Data collection was conducted in January 2007. A pilot test was undertaken in 10 houses of each village. Supervision for the completeness of the forms was done. The study employed a house-to-house survey to fill the questionnaire and to undertake eye examination. Early morning and late afternoon repeated visits were done. Absentees were replaced by neighboring inhabitants. Age, sex, occupation, marital status, educational level of each participant was recorded. Medical and ophthalmic history were obtained from each patient in their own language by trained clerks. Each participant then received a vision and eye examination, including presenting visual acuity using well illuminated illiterate Snellens E chart at 6 m, visual acuity using a pin hole, lid and ocular surface examination, and Ophthalmoscopy examination.

***Definitions***

Blindness was defined as presenting VA <3/60 in the better eye. Low vision was defined as presenting VA <6/18 but >3/60 in the better eye. Trachoma was graded according to the criteria for trachomatous trichiasis (TT) and corneal opacity (CO) as defined by the WHO. No assessment for active inflammatory disease was made. The grading was performed by principal investigator, who is familiar with the diagnostic and staging criteria for trachoma.

***Ethical Considerations***

The Gender and Blindness study in the Gurage Zone of southern Ethiopia was approved by the Regional Health Bureau and the Department of Ophthalmology, Addis Ababa University Research and Publication Committee. Verbal informed consents in the participants' own language was obtained from all participants. The study was conducted in accordance with the Declaration of Helsinki. Treatment for minor ailments was provided free of charge at the examination sites, and cataract-blind participants and those requiring essential treatment were offered referral to the nearby Eye Hospital.

***Statistics***

Data entry and analysis was carried out using Epi-Info version 6.0 statistical software. Proportion with 95% CI for the main results and chi-square test for trend to explain the relationship between gender and blinding trachoma were used in analysis. Odds Ratios (ORs) and 95% confidence intervals (CIs) for the predictors were calculated. All P-values were 2 sided and were considered statistically significant when the values were <0.05.

**Results**

A total of 1100 human subjects were examined (550 men, 550 women). The mean age of participants was 53.7 ± 11.1 years, with median age of 51.0 years. The majority of the people, 899(81.7%), were illiterate. Face washing was practiced by all study participants, with 96.5% doing it more than once a day. Nine hundred and-five (82.3%) participants reported pit latrine use. The source of water was ground water (71.4%) followed by pipe water (28.6%) as seen in Table 1.

The prevalence of blinding trachoma (TT and/or CO) across the population was 6.6% (95% CI, (5.13%, 8.07%)). Trachomatous trichiasis was found in 13 (2.4%) men and in 46 (8.4%) women (with P <0.001). Trachomatous corneal opacity (CO) was also more prevalent among women, 11 (2.0%), and 2 (0.4%) in men (P = 0.01) as shown in Table 2 &3.

There were 39 (3.5%) people who were blind (where VA < 3/60 in the better eye) and 120 (10.9%) with low vision (where VA is better than or equal to 3/60 or < 6/18) among the study population. Of the 39 people who were blind, trachomatous CO was the cause in both eyes of 4(10.3%) people who were women. Similarly, there were 9(7.5%) people who had low vision as a result of trachomatous CO in both eyes. Table 3

There was a significant difference in TT and CO prevalence according to education level (P<0.001). The odds of developing TT or CO in people with no schooling was close to 5 times higher than the odds among people with a primary or higher education (OR, 4.89; 95% CI; 3.90–6.11). Women had low surgical uptake (32/73=43.8%) compared to men (11/20=55.0%) (p=0.40). The main reason for less surgical uptake was financial problem (49.2%) followed by poor knowledge about the treatment (35.6%). TT recurrence rate was 20.9% (9/43). There was no significant gender difference on recurrence of TT (p=0.30) as indicated Tables 4 & 5.

Table 1: **Socio-demographic Characteristics of the Study Population, Abeshge and Kebena districts, January 2007 (n=1100)**

| Characteristics | Gender | | Total (%) | X2,p-value |
|---|---|---|---|---|
| **Age Group (yrs)** | Men (%) | Women (%) | | |
| 40–49 | 238 (21.6) | 248 (22.5) | **486(44.2)** | |
| 50–59 | 167 (15.2) | 166 (15.1) | **333 (30.3)** | |
| 60–69 | 75 (6.8) | 82 (7.5) | **157 (14.3)** | |
| >70 | 70 (6.4) | 54 (4.9) | **124 (11.3)** | |
| **Marital status** | | | | |
| Single | 13(1.2) | 5(0.5 ) | **18(1.6)** | |
| Married | 511(46.5) | 351 (31.9) | **862(78.4** | |
| Widowed | 17(1.6) | 181 (16.5) | **198(18.0)** | |
| Divorced | 9(0.8) | 13 (1.2 ) | **22(2.2)** | |
| **Religion** | | | | |
| Christian | 135(12.3) | 101(9.2) | **236(21.5)** | |
| Muslim | 415(37.7) | 449 (40.8) | **864(78.5)** | |
| **Occupation** | | | | |
| House wife | 0 | 546(49.6) | **546(49.6)** | |
| Farmer | 546 (49.6) | 0 | **546(49.6)** | |
| Other | 4 (0.4) | 4(0.4) | **8(0.8)** | |
| **Educational level** | | | | **151.97,p<0.001** |
| Illiterate | 370(33.6) | 529(48.1) | **899(81.7)** | |
| Read and write | 65(5.9) | 6(0.5) | **71(6.5)** | |
| Primary School | 73( 6.6) | 10(0.9) | **83(7.5)** | |
| Secondary School | 42(3.8) | 5(0.5) | **47(4.3)** | |
| **Tap water use** | | | | **0.22,p=0.64** |
| Yes | 154(14.0) | 161 (14.6) | **315(28.6)** | |
| No | 396(36.0) | 389 (35.4) | **785(71.4)** | |
| **Pit latrine use** | | | | **9.47,p=0.002** |
| Yes | 472 (42.9 ) | 433 (39.4) | **905(82.3)** | |
| No | 78(7.1) | 117(10.6) | **195(17.7)** | |
| **Face washing** | | | | --- |
| Daily | 14 (1.3) | 25 (2.2 ) | **39(3.5)** | |
| >1X /day | 536 (48.7) | 525 (47.7) | **1061(96.5)** | |
| **Total** | **550** | **550** | **1100** | |

Table 2: **Gender Distribution of Trachoma Diagnoses by Clinical Grading among the Survey Population, Abeshge and Kebena Districts, January 2007**

| Diagnosis | Men (%) | Women (%) | Total (%) |
|---|---|---|---|
| TO* | 535(48.6) | 493(44.8) | **1028(93.5)** |
| TT | 13(1.2) | 46(4.2) | **59(5.4)** |
| CO | 2(0.2) | 11(1.0) | **13(1.2)** |
| **Total** | **550(50.0)** | **550(50.0)** | **1100(100)** |

**P<0.001, OR=3.77, 95%CI (1.95, 7.43)**

*TO are those people who had neither trachomatous trichiasis (TT) nor corneal opacity (CO).

Table 3: **Trachomatous Corneal Opacity as a cause of vision loss (by eye) & presenting V/A of study population, Abeshge and Kebena district, January 2007.**

| V/A | OD(right ) | | OS(left ) | | OU(both) | |
|---|---|---|---|---|---|---|
| | M (%) | F (%) | M (%) | F (%) | M (%) | F (%) |
| <6/18- >6/60 | 5(0.9) | 7(1.3) | 2(0.4) | 7(1.3) | 1(0.2) | 5(0.9) |
| <6/60- >3/60 | 1(0.2) | 2(0.4) | 2(0.4) | 1(0.2) | 1(0.2) | 2(0.4) |
| <3/60 | 3(0.6) | 13(2.4) | 4(0.7) | 9(1.6) | 0 | 4(0.7) |
| **Total** | **9(1.6)** | **22(4.0)** | **8(1.5)** | **17(3.1)** | **2(0.4)** | **11(2.0)** |
| **X2, p- value** | **0.43, p=0.31** | | **0.07, p=0.48** | | **6.30,p=0.01** | |

Table 4: **Gender Distribution of Trachomatous Trichiasis, Surgery, and Recurrence seen among the Survey Population, Abeshge and Kebena district, January 2007.**

| Characteristics | Men (%) | Women (%) | Total (%) | OR (95%CI) |
|---|---|---|---|---|
| TT-R (%) | 11(2.0) | 32(5.8) | **43(3.9)** | **0.33 (0.17-0.66),** |
| TT (L) (%) | 9(1.6) | 38(6.9) | **47(4.3)** | **0.22 (0.11-0.47),** |
| TT-R&L (%) | 7(1.3) | 24(4.4) | **31(2.8)** | **- -** |
| TT (person) (%) | 13(2.4) | 46(8.4) | **59(5.4)** | **3.77 (1.95, 7.43)** |
| Surgeries (%) = Yes | 11(55.0) | 32(43.8) | **43(46,2)** | **1.57, (0.52-4.74)** |
| = No | 9(45.0) | 41(56.2) | **50(53.8)** | |
| Recurrence (%) =Yes | 4(36.4) | 5(15.6) | **9(20.9)** | **0.32,(0.05-1.96)** |
| =No | 7(63.6) | 27(84.4) | **34(79.1)** | |

Table 5: **Reasons for not having Trichiasis surgery among the Survey Population, Abeshge and Kebena District, January 2007.**

| Reasons | Gender | | Total (%) |
|---|---|---|---|
| | M (%) | F (%) | |
| Fear of surgical complication | 1(7.7%) | 2(4.3%) | **3(5.1)** |
| Poor Knowledge about treatment | 4(30.8%) | 17(37.0%) | **21(35.6)** |
| Financial problem/surgical cost | 6(46.2%) | 23(50.0%) | **29(49.2)** |
| Inability to travel to HC-facility | 2(15.4%) | 4(8.73%) | **6(10.2)** |
| **Total** | **13(100%)** | **46(100%)** | **59(100)** |

**Discussion**

The prevalence of blindness secondary to cicatricial trachoma was 10.3% in rural Ethiopia, Abeshge and Kebena districts. The prevalence of blinding trachoma, i.e. TT and CO, was found to be 5.4% and 1.2% respectively. These figures are comparable to those reported by previous investigators. K.Regassa and T. Teshome reported 6.8% and 2.1% respectively (7). Zerihun (8) reported a 6.7% prevalence of blinding trachoma in Jimma Zone; while Bejiga and Alemayehu (9) reported a prevalence of 5.5% in Dalocha District, southern Ethiopia. Sahilu and Larson (10) found a prevalence of 3% in Sidamo areas of southern Ethiopia.

The reduced prevalence of TT (5.4% compared with 6.8%) showed that a repeat survey in 5 years would show a decreased prevalence of TT/CO. The prevalence of CO is less than that of Cambodia (2.5%) (11); however, it exceeds that which has been described in Tibet, where no trachomatous CO was found (12). The prevalence of TT in Gurage Zone of rural Ethiopia is higher than that which has been reported in Myanmar, Meiktila (1.4%) (13), and also higher than the prevalence that has been reported in the Hainan Province of China (1.8%–3.3%) (14). The trend towards an increased prevalence of blinding trachoma among women (5.2% vs. 1.4%) has previously been reported (7-10). Women had less surgical uptake for trichiasis even though it was not statistically significant. Recurrence rate of 20.9% was comparable with the study done in Tanzania (28%) (15) and in Ethiopia, Gurage Zone (15-20%) (16) with no gender difference.

The prevalence of blinding trachoma was found to be significantly higher among those who are illiterate than among literate individuals ($P < 0.0001$). Other studies have also found the prevalence of trachoma to be significantly less among those who are literate than among the illiterate (7,8,17,18).

The current study has certain limitations. Although the participation rate was reasonable, we have no knowledge about the demographics or visual status of the nonparticipants. Although some of the nonparticipants may have had low vision (and were still able to work) it is likely that none were blind; therefore, it is unlikely that blinding trachoma was missed.

Abeshege and Kebena districts in general are communities' with blinding trachoma (6.6%). The overall rate of TT (5.4%) greater than 1% in adults leads to the conclusion that trachoma is a disease of public health significance in this community. The current prevalence of trachoma-related blindness (10.3%) in this rural Ethiopia is high. Therefore it is important to strengthen provision of Trichiasis surgical service and antibiotic distribution in the area.

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