ORIGINAL ARTICLE

RAPID TRACHOMA ASSESSMENT IN KERSA DISTRICT, SOUTHWEST ETHIOPIA

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ABSTRACT

Background: Trachoma is the leading cause of infectious blindness worldwide. Though trachoma can be treated with antibiotics (active trachoma) or surgery (trachomatous trichiasis), it is still endemic in most parts of Ethiopia. Despite the prevalence of this infectious disease in different parts of the country, district level data is lacking. This study was thus conducted to assess the prevalence estimate of trachoma and its risk factors in Kersa District, Southwest Ethiopia.
Methods: A community based cross sectional Rapid Assessment of Trachoma was conducted using a WHO guideline. Six sub-districts were selected from Kersa District based on primary high risk assessment and from each sub-district; 21-27 households were randomly selected. Active trachoma for children aged 1-9 years, trachomatous trichiasis for people above 15 years old and environmental risk factors for trachoma were assessed. Data were analyzed using SPSS version 16.
Results: The overall prevalence estimate of active trachoma was 25.2% (95% CI: 20.7-30.4%). Forty three percent of children had unclean faces, 11.5% of households had water source at more than half hour walking distance, 18.2% did not have functional latrine, and 95.3% of the households had solid waste disposal within a distance of 20 meters. Households with environmental risk factors were at an increased risk to active trachoma, but the association was not statistically significant (p>0.05). The prevalence estimate of trachomatous trichiasis inclusive of "trachoma suspects" was 4.5%.
Conclusion: Trachoma is endemic in Kersa District with active trachoma being a public health problem in the studied sub-districts. Hence, SAFE strategy should be implemented.
Keywords: Trachoma, Trichiasis, Preventable blindness, SAFE strategy

INTRODUCTION

Trachoma, a chronic infectious disease of the eye caused by Chlamydia trachomatis, mainly occurs in communities with poor hygiene, inadequate sanitation and overcrowding in a dry, hot, dusty climate (1,2). Infection with trachoma is most commonly found in children. With repeated re-infection, some people develop scarring complications and blindness in later life. The clinical manifestations of trachoma are subdivided into those associated with 'active' disease, usually seen in childhood, and those associated with the cicatricial or scarring complications, seen in late childhood and among adults (3-5).

Trachoma is the leading cause of preventable blindness worldwide, and is responsible for 1.3 million cases of blindness. In a 2003 World Health Organization (WHO) meeting, it was estimated that trachoma is endemic in 57 countries, mainly in Africa and Asia (6). It is also estimated that countries with known or suspected blinding trachoma have 3.8 million cases of blindness and 5.3 million cases of low vision, and a potential productivity loss of $2.9 billion. Prevalent cases of trachomatous visual loss yield 39 million lifetime Disability Adjusted Life Years (DALYs) (7).

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Africa has the highest prevalence of active trachoma and trichiasis worldwide (8) and the prevalence of active trachoma in the region ranges from 0.6% and 0.9% in Djibouti and Somalia to 35.5% in Egypt and Ethiopia and to 41% in Niger (9). In Ethiopia, one of the countries labeled as "trachoma endemic" by WHO (8), an estimated 68,961,045 people live in trachoma endemic areas-the largest number in Africa (8).

Despite the implementation of SAFE strategy (which stands for **S**urgery for trichiasis, **A**ntibiotics, **F**acial cleanliness and **E**nvironmental change such as clean water and latrines) in Ethiopia, the prevalence of trachoma is still one of the highest in the region. Moreover, there is a wide variation in the distribution (10). This being the case, so far, no study has been conducted in Kersa District, Jimma Zone, Southwest Ethiopia. As a result, the prevalence estimate of trachoma is unknown. This study was, therefore, carried out to identify high risk areas in Kersa District, and rank communities with trachoma based on their need for immediate intervention.

MATERIALS AND METHODS

A community-based cross sectional Rapid Assessment of Trachoma was conducted from January to February 2011 in Kersa District, Jimma Zone, Oromia Region, Southwest Ethiopia. This district, one of the 13 districts of Jimma Administrative Zone, has 31 sub-districts (kebeles), the vast majority of them (96.6%) located in the rural area. According to the 2007 national census, the district has a total population of 164,053 and an estimated number of 42,654 children aged 1-9 years and 93,510 adults >15 years of age (11).

This study was designed in accordance with the WHO guidelines of Trachoma Rapid Assessment (TRA) (12, 13). Accordingly, six sub-districts were identified in the first phase of the study using convenient sampling, and from each sub-district, a minimum of 21-27 households were selected. All children aged 1-9 years, and any persons aged >15 years and living in the selected sub-districts were included, and people who did not give their consent or who lived in the area for less than 6 months were excluded from the study.

The data were collected by a team of people consisting of ophthalmologist, cataract surgeon, ophthalmic nurse and community guider. A four days theory and practical training was given to the data collectors by the principal investigators on the assessment of trachoma (based on the WHO simplified trachoma grading system), its environmental risk factors and documentation of findings. The data collection was conducted within two weeks. During the first week, training of data collectors, communication with district and sub-district administrators and preliminary investigations to select study areas were undertaken. In the second week, a house-to-house examination was carried out as described below:

Phase I (Preliminary Investigation): In this phase, six-sub districts suspected to have high trachoma prevalence were identified based on reports from the local District Health Bureau, and discussion with health personnel and community members in the district. We selected the sub- districts/communities with one or more of the following set criteria (12):

- Uncertain situation, or suspicion of trachoma based on a previous review;
- Evidence of trachoma from health reports or from key informants;
- Isolated communities of less than 500 people;
- No easy or permanent access to water; and
- Weak, irregular or non-existent primary health care services in the area.

Phase II (Direct Observation): During phase II, a house-to-house examination of children (for active trachoma) and adults (for trichiasis) was conducted. After getting informed verbal consent from adult study subjects or parents/guardians of children, examination of each child within the age range of 1-9 years for active trachoma and all subjects >15 years of age for trachomatous trichiasis was done. The examination was carried out outdoor using disposable gloves, torch and Magnifying Loupe 2.5X (Heine HR, Germany).

In total, in each sub-district, 21 to 27 randomly selected households were visited to enroll a total of 50 children of 1-9 years old,

and in each household, all people aged >15 years were checked for trachomatous trichiasis. In addition, people "suspected" by members of the community to have trichiasis but not members of the studied households were also examined and registered if they turned out to be positive for trichiasis. Others who were suspected to have trichiasis but were not available during the study period (or not accessible for examination) were registered as "suspects" for trichiasis.

Different environmental factors for each household were also studied. Facial cleanliness was determined by checking if the child had any nasal or ocular discharge on the face. If a child had any of the above signs, he/she was recorded as positive for unclean face. When children did not have any of the above signs, they were registered as negative for unclean face. Presence of flies on the face was not taken into consideration, and distance of water source from the living house was assessed by asking the household members where they mostly get water for home use and estimating how long it would take to go one way. Presence of a nearby animal pen and/or solid wastes were assessed by directly observing where they keep animals and discard household garbage, and estimating its distance from the household in meters while assessment of presence/absence of functional latrine was done by direct observation of the latrines.

The data were checked for completeness and analyzed using SPSS version 16.0 for Windows (SPSS Inc., Chicago, IL, USA). Prevalence estimates were made using frequency tabulations while comparisons were made using Odd's ratio and chi-square tests. P-values less than 0.05 were taken as significant association.

In our study, the following case definitions were employed: 'Active trachoma' was defined as presence of a follicular trachomatous inflammation (TF) or intense trachomatous inflammation (TI) while 'blinding trachoma was defined as a state of trachomatous eye condition where the patient has trichiasis. Cases which were reported to have trichiasis by the villagers based on the description of their eye problem, presence of rubbing lashes and history of epilation or other surgery were labeled as trachoma suspect. 'Endemic trachoma' was defined as active trachoma prevalence rate of 5% and above while 'community/sub-district' was defined as the lowest level of government administrative region in Ethiopia.

Ethical approval was secured from Jimma University Ethics and Research Committee and the study was conducted in accordance with Helsinki Declaration. A letter was acquired from the District Health Department to the administrators of each sub-district. For all participants ≥18 years old, the purpose of the study and its potential benefits were explained; and participants were allowed to ask questions related to trachoma and to the study, too. And, proper explanations were given by the data collectors. Once understanding of the study purpose was assured by the study participants, informed verbal consent was obtained. For all subjects less than 18 years old, verbal consent was obtained from parents/guardians. When no guardian or parent was available, the household was skipped. Participation in this study was totally voluntary. Tetracycline eye ointment was provided to the children found to have associated bacterial conjunctivitis. Patients with trichiasis and other significant eye/medical problems were referred to Jimma University Hospital. Furthermore, all information collected for the study was handled confidentially.

RESULTS

A total of 305 children were examined from 148 households in selected 6 sub-districts of Kersa District, Jimma Zone, Southwest Ethiopia. Of the total number of children, nearly half (151) were females and 195(64%) were in the age range of 1-5 years.

The overall prevalence estimate of active trachoma in Kersa District was 25.2%. All of the sub-districts had a prevalence estimate of more than 9%, and there was a significant difference among some of the sub-districts; the highest prevalence (42.3%) in Gello sub-district and the lowest (9.8%) in Kitimble sub-district (Table 1). The prevalence of active trachoma was slightly higher (27.2%) among females than among males (23.4%); and within age group 1-5 years (26.2%) than age group 6-9 years (23.6%). However, there was no statistically significant association between sex and age and active

trachoma (p>0.05). On the other hand, among children with active trachoma, 48 (62.3%) had Trachomatous folliculitis (TF) while the rest 29 (37.7%) had trachomatous inflammation intense (TI).

Table 1: Prevalence estimate of active trachoma in Kersa District, 2011

Group	Sub-group	No	Prevalence	95% CI
Overall	Overall	77	25.2	20.7 - 30.4
Sub-district				
	Babo	7	14.0	4.3 - 23.8
	Bulbul	14	28.0	15.4 - 40.6
	Gello	22	42.3	28.7- 55.9
	Kitimbile	5	9.8	4.3 - 21.0
	Siba	11	22.0	10.4 - 33.6
	Tikur Balto	18	34.6	21.5 - 47.7
Age group	1-5 years	51	26.2	20.5 - 32.7
	6 -9 years	26	23.6	16.7 - 32.4
Sex	Male	36	23.4	17.4 - 30.7
	Female	41	27.2	20.7 - 34.8

The overall prevalence estimate of trachomatous trichiasis inclusive of "trachoma suspects" was 4.5% and the prevalence estimate of confirmed trichiasis cases was 3.6%. There were a total of 8 (4 new, 3 recurrent and 1 suspect) trichiasis cases in Bulbul and 7(2 new, 3 recurrent and 2 suspect) in Babo sub-districts (Table 2).

Table 2: Distribution of trachomatous trichiasis in Kersa District, 2011

Sub district	New cases	Recurrent cases	Suspects	Total
Babo	2	3	2	7
Bulbul	4	3	1	8
Gello	2	0	0	2
Kitimbile	1	3	0	4
Siba	4	1	1	6
Tikur Balto	1	0	2	3
Total	14	10	6	30

Forty three percent of the examined children were found to have unclean faces. There was a statistically significant variation in the distribution of children with unclean faces among the sub-districts. The highest (73.1%) prevalence of unclean faces was found in Gello sub-district while the lowest (24%) was identified in Bulbul sub-district (table 3).

Overall, 17(11.5%) of the households had distant water sources; Gello sub-district had the highest percentage of households with distant water sources (16.7%) whereas Kitimbile had the lowest (3.7%). Similarly, out of the total households studied, 27(18.2%) had no functional latrine; Kitimbile had the highest proportion of people without functional latrine, (29.6%), while Gello had the lowest (4.2%). One hundred forty one (95%) of the total households had solid waste nearby the household and the highest proportion was registered in Gello and Tikur Balto (100%), whereas the lowest was registered in Babo (90.5%) as indicated in table 4. It was also observed that most people had animals which either lived in the same house with people or in a separate but adjacent house.

Table 3: Prevalence of unclean faces in Kersa District, 2011

Sub-district	Prevalence	95% CI
Babo	50.0	35.9 - 64.1
Bulbul	24.0	12.0 - 36.0
Gello	73.1	60.9 - 85.3
Kitimbile	51.0	37.1 - 64.9
Siba	30.0	17.1 - 42.9
Tikiur Balto	28.8	16.4 - 41.3
Overall	43.0	37.4 - 48.5

Table 4: Water source, latrines and solid waste disposal in Kersa District, 2011

Variable	Sub-district						
	Babo	Bulbul	Gello	Kitimbile	Siba	Tikur Balto	Total
Distant water source*							
Yes	3(14.3%)	2(7.4%)	4(16.7%)	1(3.7%)	3(12.5%)	4(16%)	17(11.5%)
No	18	25	20	26	21	21	131
Total	21	27	24	27	24	25	148
Absence of latrine†							
Yes	6(28.6%)	4(14.8%)	1(4.2%)	8(29.6%)	5(20.8%)	3(12.0%)	27(18.2%)
No	15	23	23	19	19	22	121
Total	21	27	24	27	24	25	148
Solid waste disposal‡							
Yes	19(90.5%)	25(92.6%)	24(100%)	25(92.6%)	23(95.8%)	25(100%)	141(95.3%)
No	2	2	0	2	1	0	7
Total	21	27	24	27	24	25	148

*Distant water source - more than half-hour walking distance from the household; †Absence of latrine - absence of functional latrine; ‡Households with solid waste disposal within 20 meters of the living house

Children with unclean face were at higher risk of having active trachoma than those with clean faces (OR=1.6), but the difference was not statistically significant (p=0.065) (Table 5). On the other hand, distant water source was associated with increased risk of active trachoma (1.43 times), but the difference was not statistically significant (p=0.35) (Table 5). Similarly, absence of functional latrines was also associated with increased risk (1.4 times) of having active trachoma (p=0.505). Households with solid waste nearby the house were more likely (1.9 times) to have children with active trachoma than those households who did not have solid waste nearby the house (p=0.322) (Table 5).

Table 5: Association of risk factors with active trachoma in Kersa District, 2011

Variable	Active trachoma		
	No (%)	OR (95% CI)	P-value
Unclean face			
Yes	40 (51.95)	1.6 (0.9 - 2.7)	0.065
No	37 (48.05)		
Total	77 (100.00)		
Distant water			
Yes	5 (14.29)	1.43(0.458-4.299)	0.35
No	30 (85.71)		
Total	35 (100.00)		
Absence of latrines			
Yes	4 (11.43)	1.427(0.162-1.575)	0.505
No	31 (88.57)		
Total	35 (100.00)		
Solid waste *			
Yes	34 (97.14)	1.91 (0.222-16.398)	0.322
No	1 (2.86)		
Total	35 (100.00)		

*Presence of solid waste within 20 meters radius of the house

DISCUSSION

This study was designed in accordance with TRA guidelines and hence a convenience/ purposeful sampling technique was used to bias the selection of a strictly limited number of communities aiming to identify the most endemic areas. The prevalence values of this study are, therefore, described as 'prevalence estimates' as it is not possible to draw conclusions regarding trachoma prevalence at district or county level based on rapid assessment results. We studied the worst case scenario to determine whether trachoma is a public health problem in the sub-districts and hence to provide guidance to the trachoma control program on where to target the limited resources. This puts a limit in directly translating the findings in this study to the overall district. It is also good to note that comparisons made with other populations based prevalence surveys are only approximations as there is an inherent difference in the sampling techniques. Despite all this, we believe that our study has come up with important and reliable findings that are helpful in planning interventions in the studied communities.

The overall prevalence estimate of active trachoma in the study area was 25.2%. If the TRA results are taken as estimates of prevalence, they indicate that all communities surveyed in Kersa District except Kitimbile exceeded active trachoma prevalence in children aged 1-9 years old (10%), at which level WHO recommends mass drug administration (MDA) of antibiotics (2). This finding is in agreement with other studies done in different parts of the country. Zerihun et al has found 24.5% prevalence of active trachoma in Jimma Zone (14) while Abebe et al reported a prevalence of 51.5% in Dalocha District, Central Ethiopia (15). This figure is slightly less than the national prevalence of active trachoma in the neighbouring Kenya (16). Since the sub-districts in the present study were selected based on "perceived high risk" for trachoma, the entire

district is likely to have a lower level of trachoma.

Active trachoma was found to be hyperendemic in four of the six sub-districts (Siba, Bulbul, Tikur Balto and Gello) warranting family based treatment and health promotion; and mesoendemic in Babo sub-districts necessitating treatment of cases and all household contacts. If TRA findings indicate that trachoma is likely to be mesoendemic to hyperendemic as in the case of the 5 target sub-districts, population based prevalence survey may then be necessary to generate sound baseline data prior to implementation of SAFE strategy so that the trachoma control program can be monitored and evaluated over time (12,13).

In this study, the prevalence estimate of trachomatous trichiasis inclusive of the ‘‘trachoma suspect’’ cases was 4.5% and that of confirmed trichiasis cases was 3.6%; which is comparable to the national prevalence (3.1%) (10). However, the trachoma prevalence in our study was likely to have been overestimated as unconfirmed cases “suspects”, and people who resided in households outside the sampled households but were found to have a confirmed trichiasis were included in the study. Although we were aware that this might slightly increase our prevalence estimate of trichiasis, addition of these groups of people in the study was made for the sake of addressing their blinding trachoma in time as recommended by WHO Guideline (17, 18).

The prevalence of unclean faces among children (48.5%) was relatively lower than the finding by Golovaty et al in Ankober, Ethiopia, which stood at 76% (19). This may be due to the fact that most of the residents in the study area were people relocated by the government to places that are closer to water sources (Kersa District official report). This assertion looks more plausible when we observed the distance of water sources from the residential area, which showed that about 89% of the residents were living in less than a half hour walking distance from water sources. People with unclean faces were found to be at 60% increased risk of having active trachoma as compared to those with clean faces (OR: 1.6, 95%CI: 0.9-2.7). Similar results were reported in Tanzania where the odds of trachoma were 70% higher among children with flies and nasal discharge on their faces than those with clean faces (20). Other studies like the one conducted by Golovaty et al have found even much stronger association between unclean faces and active trachoma (19).

Nineteen percent of the studied population reported that they did not have a functional latrine. Moreover, about 95% of the population in the districts had solid waste disposal within a 20 meters radius of the house and people with solid waste near the house had a 90% increased risk of having trachoma as compared to those with waste disposal beyond 20 meters. The odds of trachoma were 40% higher in people without functional latrine than those who had one. However, the difference was not statistically significant (p=0.183). This is in contradiction with most other studies done previously which showed a strong association between absence of latrines and active trachoma (21-23). This difference might be caused by the fact that most of the households in our study area were built by a newly settled community (relocated from other places) and hence the toilets might have been built at the same time with the new houses, but the culture to use them might not have been well developed.

About 89% of the households had water sources within a 30 minutes’ walking distance and those households with distant water source (more than 30 minutes’ walking distance) were found to be 1.4 times at increased risk of acquiring active trachoma (OR:1.43, 95%CI:0.458-4.299). Nonetheless, the difference was not statistically significant (p=0.35). Several other studies have had conflicting results about this factor. Although the majority of such studies supported the notion that decreased distance of water sources increases personal and environmental hygiene thereby decreasing prevalence of trachoma (21, 24-26), two studies (12,14) found out that this is not always the case. In fact, in one study conducted in Jimma Zone (12), long distance from water source was found to be protective from trachoma. These irregularities may be indicative of the fact that water utilization for hygiene is not only determined by distance of the source alone. Other factors, for example, availability of women who are usually the ones

who fetch water, habit of face washing, knowledge and practice of personal hygiene might play an important role in development of active trachoma.

In conclusion, trachoma is endemic in Kersa District and active trachoma is a public health problem in the studied sub-districts. The sub-districts should, therefore, be prioritized for further trachoma-focused interventions. Intervention strategy should be in place to provide medical treatment (with antibiotics) to patients with active trachoma and a plan should also be put in place to reach outpatients with trachomatous trichiasis and offer them trichiasis surgery so that blindness can be prevented. Health education about facial cleanliness, use of latrine and proper solid waste disposal should be given using a multidisciplinary approach. Furthermore, a population based prevalence study should be carried out to baseline prevalence data on active trachoma and trachomatous trichiasis in the whole district for monitoring and evaluation of subsequent interventions.

ACKNOWLEDGEMENTS

We would like to thank members of the data collecting team, statisticians, Kersa District Health Department, Community leaders and members of community for their cooperation during data collection. Our special thanks go to Lions Club, Bavaria, South Germany for sponsoring this study. The authors declare that they have no competing interest.

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