



Prevalence of Active Trachoma and its Associated Factors Among Children Aged 1-9 Years in Dessie City Administration, Amhara Region, Ethiopia 2015

Kubra Gobeze Ahmed

MPH, NGO worker

Prof (Dr). P. Surender Reddy

PhD

Shambel Wodajo

MPH, Lecture, Dept.of Public Health, College of Medicine & Health Sciences, Wollo University, Ethiopia

Yeshimebet Ali

MPH, Lecture, Dept.of Public Health, College of Medicine & Health Sciences, Wollo University, Ethiopia

ABSTRACT

Background: Trachoma is leading preventable infectious eye disease in developing countries that have poor personal and environmental hygiene; inadequate water supply and poor socioeconomic status Objective: To assess the prevalence of active trachoma and its associated factors among children aged 1-9 years old in Dessie city administration, Amhara regional state, Northeast Ethiopia.

Methods: Community based cross sectional study with the sample of 396 households

Results: The prevalence of active trachoma among children 1-9 years old in the study area was found to be 26.8%. It varied from 25.5% in urban area to 32.9% in rural area.

Conclusions and recommendations: The prevalence of active trachoma in this study was high, compared to WHO recommendation. It is recommended to educate and convince the people to maintain personal and environmental hygiene, face washing habit in children, using soap for face washing, increase latrine utilization coverage and Azithromax use as single annual dose.

KEYWORDS : Active trachoma, SAFE strategy

Introduction

Trachoma is the commonest infectious cause of blindness. Recurrent episodes of infection with serovars A–C of *Chlamydia trachomatis* causes conjunctival inflammation in children who develop scarring and blindness as adults (1)

Though previously trachoma had a public health problem worldwide, now it is largely found in poor, rural and low-income countries, particularly in sub-Saharan Africa in which 150 million people have active infection, over 5 million are blind or have serious visual loss from trachoma and 100 million children are thought to be in need of treatment (2, 3).

The World Health Organization (WHO) endorses four-pronged approach to eliminate blinding trachoma by the year 2020 known as SAFE: Surgery for trichiasis (Antibiotic against infection, Facial cleanliness, and Environmental sanitation). The SAFE strategies have been associated with reductions in the prevalence of active disease over the past 20 years, but there remain a large number of people with trichiasis who are at risk of blindness resulting from recurrent childhood infection (4). Understanding associated factors is essential in designing appropriate interventions for the 'F' and 'E' components of the SAFE strategy (5-14).

It is the second most common preventable cause of blindness worldwide accounting for 15.5% of total blindness and WHO estimates over 6 million people has active trachoma. Approximately 2 million people require eyelid surgery for trichiasis in order to prevent vision loss (7, 8).

Concerning to Africa, in Algeria the overall trachoma prevalence in school health was 26%, in Burkina Faso national prevalence was 26.9% (TF/TI) and in Ghana over all prevalence was 16.1% (TF/TI) among children less than 10 years was 29.7% (7). According to WHO report in 1979, trachoma caused blindness in 40.6% of rural population of Uganda and in 35% of Kenyan rural popu-

lation.

In Ethiopia trachoma is known to be a public health problem in all parts of country & estimated prevalence of active trachoma is 45%, TS 80%, TT 3% & CO 0.4% (7). National blindness prevalence is estimated to be 1.25% meaning that more than 900,000 to 1,000,000 persons believed to be blind of which nearly 400,000 are related to trachoma .

Since there is no documented evidence about the prevalence and associated factors of trachoma in the study area, this study is useful to fill this gap

General objective

To Assess the prevalence of active trachoma and factors associated with it among children age 1-9 years in Dessie city administration, Amhara regional state 2015.

Specific Objectives

- 1: To determine the prevalence of active trachoma among children age 1-9 years old.
- 2: To identify factors associated with active trachoma among children age 1-9 years old.

Methods and materials

Community based cross sectional study with stratified sampling to select rural and urban kebeles. From each Kebele, samples are selected proportionally with systematic random sampling. Final sample of 396 is decided by using single population proportion formula. Data was analyzed with SPSS software version 16. Ethical clearance was obtained from the concerned authorities. Data was collected in December 2014 and January 2015 from Dessie City Administration of Ethiopia.

Results

Table1: Distribution of study children by age and sex,

Dessie City Administration, Dec 2014 - Jan 2015

Age (in years)	Male	Female	Total
1-3	61(33.5%)	76((35.5%)	137(34.6%)
4-6	64(35.2%)	69(32.2%)	133(33.6%)
7-9	57(30.6%)	69(32.2%)	126(31.8%)
Total	182(46%)	214(54%)	396(100%)

Socio-demographic and economic characteristics

In the study area, 258(65.2%) children live in female headed households and among them 214 (65.4%) are urban. Among the total sample, 172(52.8%) household heads are daily labourers and 47(67.1%) are farmers.

Out of the total study children, 112(28.3%) have parent who are unable to read and write. 100(30.7%) children from urban area live with heads of households who were unable to read and write. In the study area 352 children (88.9 %) were living in families of six or less members, at the time of the study. Families of 119(30%) children whose monthly income were less than 500 ET BR from which 105(32.2%) and 14 (20.0%) are in urban and rural area respectively.

Out of the total 226 children who were old enough to go to school, only 204 (51.5%) were attending school or quitted recently, and out of the total study children 244(74.8%) children reside in households with one up to two rooms were in urban areas.

Housing condition

273(68.9) urban and 54(77.1) rural children cook their food outside living room where the family live. 66.9 % (265) of the total household children doesn't had window to cooking room. The proportion of children who live in houses without windows was 88.6% (62) in rural areas. Those families of 40 children (57.1%) in rural areas had cattle, and families of 14 (34.2%) children keep their cattle in the same room where the family lives pass nights with their cattle in the same room.

Water source and consumption

The common sources of water for domestic consumption was pipe (for 94.9%). 314(96.3%) of children in urban area reside in households, who get their water for household consumption from pipe. 372(93.9%) children get their water travelling for less than 1/2hr. The water source was near (less than ½ hour away from their home), those families of 67(95.7%) children in rural area get their water after <1/2 hour travel from home. 289 (73.0%) live in households where the average daily water consumption is 4 – 8 litters/capita.

Waste disposal

325(82.1%) had latrine. In sub city and kebeles, most of the families dispose their domestic wastes by waste disposal association. Families of 243 (74.5%) family of children in urban areas dispose their garbage by waste disposal association members. Those children who wash their faces one time per day were 70(17.7%) of the total wash their face once a day.66 (20.2%) living in rural area, and those children use soap for face washing were Only 269(67, 9%).

Magnitude of active trachoma

Signs of active trachoma were detected in 106(26.8%) of the total study children. The prevalence varied from 25.5% in urban kebele to 32.9 % in rural kebele. The prevalence of active trachoma was 30.8(41) in age group 4-6 years of children.

The prevalence of active trachoma in children living in female headed households were 27.2% (71) and the magnitude of active trachoma is in children of households headed by farmer were 20(37.7%)

Among 112 children of households with illiterate heads (unable to read and write) 51(45.5%) were active trachoma cases. Among children living in households with family size of six or more 92(26.1%) had active trachoma

The prevalence of active trachoma was 28.9% (13) in families with the number of less than 10 years children above two. Among 119 children whose families' monthly income less than 500 ET BR were 48(40.0) had signs of active trachoma.

Among the total 396 children 192 who were not attending school,

signs of active trachoma were found in 28.1% (54).

Among 278 children who live in households with one up to two rooms, 27.3% (76) had active trachoma.

The prevalence was found to be 32.9% (23) in children residing in rural areas and 25.5% (83) was observed in children residing in urban area.

The prevalence those children of families who get their water from river constitute 2.2 % (9) of the total, and the proportion of active trachoma cases among them was found to be 44.4 % (4).

As the result showed that prevalence of active trachoma in children of families who travel more than ½ an hour to fetch water were 26.9% (100)

And Signs of active trachoma were detected in 29(30.9%) children who consume less than 4 litter /capita /day.

As the result showed, out of 123 children residing in households which use their living room for cooking, 32.3% (40) had active trachoma.

Out of 265 children of households with absence of windows, 31.9% (84) were found to have signs of active trachoma and,

The prevalence of active trachoma in children of households without functional latrine was 34(47.9%).

Signs of active trachoma were observed in 6(40.0%) children of families who dispose their garbage in the farm land.

In the study area, families of 52 (13.1%) children had cattle, and the prevalence of active trachoma in the same children was 42.3% (22).

The proportion of active trachoma cases, among children who pass the night in the same room with cattle was 75 % (3).

Active trachoma occurred in 80.6 % (29) in children washing less than 7 times per week.

The study also showed that prevalence of active trachoma in those children who did not use soap for face washing was 59.1% (75 out of 127).

Factors Associated with active trachoma

In Bivariate logistic regression analysis, each explanatory variable with outcome variable (trachoma status) was assessed for its association. Occupation of head of the house hold, educational status of head of house hold, cattle ownership and monthly income of the family from demographic factors and absence of window in cooking room, absence of functional latrine in the family, face washing habit of the child and soap not use by children for face washing from environmental factors shows significant association with the occurrence of active trachoma.

Those families of children whose children of house hold headed by farmer were more than 4 times more likely to have active trachoma than those house hold headed by government employees [COR= 4.364, 95%CI= (1.470, 12.951)] and those children of house hold headed by daily labourers were more than 3 times more likely to have active trachoma than those house hold headed by government employees [COR=3.094, 95%CI= (1.149, 8.329)].

Those children of households with illiterate heads (unable to read and write) were more than 3 times more likely to have active trachoma than those household headed completed their education and above [COR=3.989, 95%CI= (2.370, 6.714)].

Those children of household headed by having cattle ownership were more than 2 times more likely to have active trachoma than those household headed by no cattle ownership [COR=2.270,95%CI= (1.242, 4.147)].

Those children whose families' monthly income less

than 500 ET BR were more than 4 times more likely to have active trachoma than those children whose families' monthly income greater than 1500 ET BR. [COR= 4.182, 95%CI= (2.008, 8.710)] and those children whose families' monthly income between 500 ET BR and 1000ETB were more than 2 times more likely to have active trachoma than those children whose families' monthly income greater than 1500 ETBR. [COR=2.431, 95%CI= (1.137, 5.195)].

Sex of head of the household, Family size, Number of children < 10 years in the family, Age of the child, Educational status of the child and Number of rooms in the family had no significant association with active trachoma.

Annex II indicates on environmental and behavioural factors in children with respect to active trachoma.

Those Children of households headed by absence of windows were more than 2 times more likely to have risk of trachoma than those Children of households headed by presence of window [COR=2.299, 95%CI= (1.359, 3.891)]

The families of the study children those absence of functional latrine were more than 3 times more likely to have active trachoma than those house hold headed by presence of functional latrine [COR=3.229,95%CI= (1.893, 5.509)].

Those children practicing face washing one time per day were more than 7 times to have trachoma than those practicing two times per day [COR 7.643(4.284, 13.633)]

And those children practicing face washing less than seven times per week had relatively high risk with the odds of [COR=26.663, 95%CI= (10.931, 65.035)]

Those children not using soap for face washing were more than 11 times more likely to have trachoma infection than those who use soap for face washing [AOD=11.073, 95% CI= (6.617,18,531)]

Resident, water source for domestic consumption, distance of water source from home, daily average Water consumption, Cooking place, waste disposal system and Cattle shelter has no association with ac-

tive trachoma.

Among variables which were entered to multiple logistic regression; - educational status, cattle ownership, sex of child, residence, absence of functional latrine, Face washing habit and no use of sop for face washing were statistically significant

Multivariable Analysis
Determinants factors of Active trachoma

Odds of Active trachoma cases in families of child unable to read and write were more than 3 times more likely to have active trachoma than those families of the child who completed their education and above [AOR=3.289,CI= (1.572, 6.879)]

The odds of cattle owner ship were more than 3 times to have active trachoma than those who have no cattle in their house [AOR=3.046, 95%CI= (0.115, 0.937)].

Female children were more than 2 times more likely to have active trachoma than male children [AOR=2.137, 95% CI= (1.119, 4.078)].

Place of living in rural area were more than 6 times more likely to have active trachoma than those who were living in urban area [AOR=6.409, 95%CI= (2.212, 18.572)].

Who do not used functional latrine properly were more than 3 times more likely to have active trachoma than those who use functional latrine [AOR= 3.484, 95%CI= (1.552, 7.824)].

Practicing face washing one time per day were more than 5 times more likely to have active trachoma than those practicing two or more times per day [AOR=5.537, 95% CI= (2.478, 12.374)].

Practicing face washing less than seven times per week were more likely to have active trachoma than those practicing two or more times per day with the odds of [AOR=30.282, 95%CI=(9.129, 100.450)]

The odds for no soap use for face washing have 12 times more likely to have active trachoma than those who use soap [AOD=12.589, 95% CI= (5.598, 28.310)]

Table 2: Determinant factors associated with active trachoma among children age 1-9 years old, Dessie City administration, December, 2014-January, 2015.

Variables	Active trachoma		COR(95%CI) (n=396)	AOR (95%CI)
	present	absent		
Literacy status Unable to read and write Able to read and write 1- 12 grade & above	51 20 35	61 62 167	3.989(2.370-6.714) *** 1.539(0.826, 2.867) 1.00	3.289(1.572, 6.879)** 1.346(0.585, 3.099) 1.00
Presence of cattle in the family Yes No	22 84	30 260	2.270(1.242, 4.147)* 1.00	3.046(1.067, 8.699)* 1.00
Sex of the child Male Female	41 65	141 149	1.00 1.500(0.953, 2.362)	1.00 2.137 (1.119, 4.078)*
Resident Urban Rural	83 23	243 47	1.00 1.433(0.820, 2.502)	1.00 6.409(2.212, 18.572)**
Households With latrine Without latrine	72 34	253 37	1.00 3.229(1.893, 5.509)***	1.00 3.484(1.552,7.824)**
Face washing habit Twice or more times/day Once per day Less than once per day	39 38 29	251 32 7	1.00 7.643(4.284, 13.633)*** 26.663(10.931,65.035)***	1.00 5.537(2.478,12.374)*** 30.282(9.129,100.450)***
Soap use Yes No	31 75	238 52	1.00 11.073(6.617, 18.531)***	1.00 12.589(5.598,28.310)***

*P<0.005: significant.

**P<0.001: highly significant.

***P<0.0001: extremely significant.

1.00=reference OR=Odds ratio, CI=Confidence interval

Discussion

The prevalence of active trachoma in this study was 26.8%. It varied from 25.5% in urban area to 32.9% in rural area. This finding was in line with study done in African countries in Algeria (26%), Burkina Faso (26.9%), in Ghana (29.7% (7), Tanzania (30.9%), Malawi (25.1%) (11), and in Ethiopia the national prevalence; Tigray (26.5%) (8), Somali (22.6%) (8), in south western Ethiopia 24.5% (16), in kersa district, in Baso Liben District of East Gojjam, 24.1% (26) and in Gondar Zuria District, Northwest Ethiopia (23.8%) (17)

Trachoma affected a large segment of the children population in study area. It was much more in magnitude than findings of earlier studies carried out in Brazil, Guatemala and Mexico, where the prevalence of the inflammatory and follicular phase of the disease in children under 10-years-old was 4.5, 1.9, and 1.9%, respectively (10)

This difference may be due to the countries are developed countries and the strategies and efforts done to control trachoma, but absence of zitromax mass distribution in urban area of this study increases the burden of active trachoma.

This result, however, was less in magnitude than other studies done in African countries like Niger (43 %), and Sudan (64.5%) Nigeria (35.7%) (13, 14 and 15)

In Ethiopia, the national estimated prevalence (45%), in Amhara region (62.6), Oromia (41.3%), SNNP (33.2%), South Gondar 65.2 % (8), and South Wollo (40.9%) (12), South-Gonder zone Northern Ethiopia (40.9%) (21).

The possible reason for this discrepancy may be due to differences in the study area and time of study, as both urban and rural areas were studied together at the same time, enhancement of urban health extraction programs, improvement of health extinction program in rural areas and zitromax mass distribution in rural areas.

Educational statuses of head of house hold have significant association with active trachoma

[AOR=3.289, CI= (1.572, 6.879)]

This is in line with the study done in Baso Liben District of East Gojjam, Ethiopia, The association of having illiterate parents increased risk of trachoma (26). The possible reasons for this may be due to illiterate head of house hold have little access to health information and health care practice for their children compared to literate.

In this study there is association between presence of cattle in their house and active trachoma. This is in line with the study done in Ethiopia by Desole who showed that there is an association between cattle and trachoma (19). The possible reason for this may be due to the choral of the cattle is a suitable environment for the flies (trachoma vectors) to breed.

Sex of the children has significant association with active trachoma, being female children have higher risk of trachoma odds of [AOR=2.137, 95% CI= (1.119, 4.078)]

This has been confirmed by studies done in Kenya and the united republic of Tanzania (11).

The possible reasons may be due to females spend most of their time in their home for supporting their mother , taking care of her younger siblings, they are exposed to dust during cleaning of the house and they are also exposed to smoke at the time of cooking.

Residence have significant association and active trachoma (higher in rural areas than in urban areas) [AOR=6.409, 95%CI= (2.212, 18.572)], it is almost similar with the study done by the national prevalence of active trachoma in rural areas. Prevalence of active trachoma is almost fourfold compared to the urban (42.5% rural Vs 10.7% urban) (8).The possible reason for the little discrepancy may be due to; the study done in national prevalence include extreme rural areas, lifestyle, difference in socio demography and time of study.

The association of the absence of a functional latrine near the house

with trachoma have been detected in the study area [AOR= 3.484, 95%CI= (1.552, 7.824)], this is in line with a study done in Jimma, Ethiopia (16).The possible reason for this may be households without functional latrine indirectly provides favourable condition for flies to breed due to open field defecation.

Face washing habit also have significant association once and less than once a day compared with those who wash their face twice a day [AOR=5.537, 95% CI= (2478, 12.374)].

This is similar to study findings in Wereilu woreda, South Wollo documented significant association between children's face washing habit less than once per day and the prevalence of trachoma (20).This may be due to the number of flies which rests on the face of victim (to transmit the disease) increases on those who have less washing habit.

Significant association was observed in children who do not use soap for face washing than in those who use soap [AOD=12.589, 95% CI= (5.598, 28.310)]

This finding is in line with a study done among children in Baso Liben District of East Gojjam, Ethiopia (26). The possible reason for this may be using soap for face washing reduce the risk of contamination.

Conclusion

The prevalence of active trachoma in the study was high as compared to WHO recommendation. This implies that active trachoma is still a major public health concern among children aged 1-9 years in the study area. The study also revealed that the associated factors for active trachoma were educational level of parent, cattle ownership, residence, sex of child, face washing, not using soap for face washing and absence of latrine.

Recommendations

Ministry of education should strengthen and continue its work on improving educational at all level and parents should be encouraged to send the children to schools.

Ensure to improve face washing and construction of utilizable latrines that are being implemented by the health extension package has to be strengthened in the area, this essentially needs intersectional collaboration between governmental organizations.

Health providers and health extinction workers should strongly work in awareness creation for the head of house hold to have access to health information and health care for their children.

The sex related prevalence of trachoma should be further investigated

References

- Hu VH, Harding-Esch EM, Burton MJ, Bailey RL, Kadimpeul J, Mabey DC. Epidemiology and control of trachoma: Systematic review. *Trop Med Int Health* 2010; 15:673-91
- Mariotti SP, Pascolini D, Rose-Nussbaumer J. Trachoma: Global magnitude of a preventable cause of blindness. *Br J Ophthalmol* 2009; 93:563-8.
- Sandford-Smith J. Eye diseases in hot climates. 4th ed. Delhi: Replica press Pvt Ltd; 2006
- Medicine WLSoHaT. International Trachoma Initiative: Trachoma: A guide for programme managers. Geneva; 2006
- WHO: Blindness: vision 2020: control of major blinding disease & disorder
- Taye A, Alemayehu W, Melese M, Geyid A, Mekonnen Y, Tilahun D, et al Seasonal and altitudinal variations in fly density and their association with the occurrence of trachoma, in the Gurage zone of central Ethiopia. *Ann Trop Med Parasitol* 2007;101:441-8
- Report of the six meeting of the WHO alliance for the global elimination of Blinding trachoma, Geneva, Switzerland, (November 2001).
- Berhane Y, Worku, A, Bejiga L, Adamu W, Alemayehu hu A, et al. Prevalence of trachoma in Ethiopia: *The Ethiopian Journal of Health Development*. 2007; 21: 211- 215.
- Ngondi J, Gebre T, Shargie E.B, Gravesa P.M, Ejig- semahu Y, Teferi T, et al. Risk factors for active trachoma in children and trichiasis in adults: A household survey in Amhara National Regional State, Ethiopia. *Trans- actions of the Royal Society of Tropical Medicine and Hygiene*. 2008; 102: 432-438. <http://dx.doi.org/10.1016/j.trstmh.2008.02.014>
- Furtado JM, Lansingh VC, Carter MJ, Milanese MF, Peña BN, Ghersi HA, et al. Causes of blindness and visual impairment in Latin America. *Surv Ophthalmol* 2012; 57:149-77
- Whitcher J.P. Srinivasan M. Upadhyay M.p. Corneal blindness: a global perspective.

Bulletin of the world health organization. 2001; 79(3): 214-221.

12. Thomson I. A clinic based survey of blindness and eye diseases in Cambodia: *British Journal of Ophthalmology.1997; 81: 578-580.*
13. Abdou A, Nassirou B, Kadri B, Moussa F, Munoz BE, Opong E, et al. Prevalence and risk factors for trachoma and ocular Chlamydia trachomatis infection in Niger Br J Ophthalmol 2007; 91:13-7
14. Ngondi J, Matthews F, Reacher M, Onsarigo A, Matende I, Baba S, et al. Prevalence of risk factors and severity of active trachoma in southern Sudan: An ordinal analysis. *Am J Trop Med Hyg 2007; 77:126*
15. Mpyet C, Goyol M, Ogoshi C. Personal and environmental risk factors for active trachoma in children in Yobe state, north-eastern Nigeria. *Trop Med Int Health 2010; 15:168-72.*
- 17.
18. Zerihun N. Blindness in Jimma: A hospital based survey, *Ethiop. J. Health Dev. 1996; 10(1):1-5.*
19. Destayes et al Risk factors for active trachoma among children aged 1-9 years in Maksegnit town. Northwest Ethiopia. *Saudi Journal for health Sciences. 2013; 203 (2)*
20. M. Gedefaw et al. / Health 5 (2013) 1768-1773 **Vol.5, No.11, 1768-1773 (2013)** <http://dx.doi.org/10.4236/health.2013.511238> Current state of active trachoma among elementary school students in the context of ambitious national growth plan: The case of Ethiopia
21. Sole G.D. Impact of cattle on the prevalence and severity of trachoma: *British Journal of Ophthalmology. 1987; 71: 873-876.*
22. Lemma E. Prevalence and risk factors of trachoma among children of Wereilu Woreda, South Wollo administrative zone, *Ethiop. J. Health Sci. 2001; 11(1): 27-35.*
23. Teweled Y. Assessment of effect of house hold extension package on prevention of trachoma: in Kola Tembien District, North Ethiopia
24. Sahlou T, Larson C. The prevalence and environmental risk factors for moderate and severe trachoma: in southern Ethiopia. *Journal of tropical medicine and hygiene. 1992; 95:36-41.*
25. Berta. E. (2004) Prevalence and risk factors of active trachoma among children of rural area: south Gondar, Ethiopia. 2004; MPH Thesis, Addis Ababa University, Ethiopia
26. Emerson P.M, Lindsay S.W, Walraven G.E et al. Effect of fly control on trachoma and diarrhea: *Lancet. 1999; 353:1401 –1403.*
27. Hailu G and Sheferaw A. Assessment of prevalence of active trachoma in elementary school students: in Awl zone
28. Ketema K, Tiruneh M, Woldeyohannes D, and Muluye D. Active trachoma and associated risk factors among children: in Baso Liben District of East Gojjam, Ethiopia. *BMC Public Health. 2012; 12, 1105.* <http://dx.doi.org/10.1186/1471-2458-12-1105>