

Prevalence of active and potentially blinding trachoma in Laikipia district, Kenya

AUTHORS

¹Karimurio J, ²Ilako F, ³Gichangi M

¹Department of Ophthalmology, College of Health Sciences, University of Nairobi, P.O. Box 19676-00202, Nairobi, Kenya

²African Medical and Research Foundation, P.O. Box 27691-00506, Nairobi, Kenya

³Division of Ophthalmic Services, Ministry of Health, P.O. Box 43319, Nairobi, Kenya

ABSTRACT

Objectives: To estimate with reasonable precision the prevalence of active trachoma (TF) in children aged 1-9 years and potentially blinding trachoma (TT) in adults 15 years and older in Laikipia District.

Design: Baseline community based survey conducted from 22nd to 30th July 2007 using the standardized WHO protocol

Setting: Laikipia District of the Rift Valley Province of Kenya.

Subjects: A total of 348 households were visited. 1,017 children aged 1-9 years and 1,225 adults aged >15 years were examined.

Results: Ninety seven out of the 1,017 children had TF hence the prevalence of TF in Laikipia is 9.5% (95% CI: 6.3-13.9). 14 out of the 1,225 adults had TT. Prevalence of TT in Laikipia is 1.1% (95% CI: 0.5-2.4).

Conclusions: Active trachoma is not a district wide public health problem in Laikipia. Potentially blinding trachoma (TT) is a district wide public health.

Recommendations: District-wide mass antibiotic treatment is not justifiable but all the suspected endemic sub-locations should be surveyed and treated where necessary. There is need for TT surgical services in the entire district.

Key words: Active trachoma, potentially blinding trachoma, minimum prevalence criteria, ultimate intervention goals (UIGs)

INTRODUCTION

Despite being a preventable disease and the reported overall downward trend in the global prevalence of blindness due to infectious diseases, trachoma still remains a major cause of blindness in poor nations like Kenya.¹ It is commonly found in areas with hot, dry, and dusty climates. Its prevalence is known to reduce with improving socio-economic status; as documented in Meru North district of Kenya.² Its control contributes towards poverty eradication and hence should be included in the health sector strategic plans aimed at achieving the Millennium Development Goals.³ In May 1998, the 51st World Health Assembly adopted a resolution calling for the elimination of trachoma as a cause of blindness and recommended that Ministries of Health should pursue the "SAFE strategy" to do so. "SAFE" stands for Surgery for trichiasis/entropion, Antibiotics for active disease, Facial cleanliness, and Environmental change to reduce transmission. It targets all key elements

believed to be necessary for a short and long term intervention program. Implementation of "SAFE" strategy is expensive and calls for broad partnership between governments and eye care partners. Due to the focal nature of trachoma, it is difficult to start a control project without baseline survey results (benchmarks). The ultimate intervention goals (UIGs) for trachoma control are: to reduce the prevalence of active trachoma (TF) to less than 5% at community level and that of TT (potentially blinding trachoma) to less than 1 case per 1,000 in people aged 15 years and older.

In 2002, the Department of Ophthalmology of the University of Nairobi (UON), African Medical and Research Foundation (AMREF) and Sight Savers International (SSI) conducted a small scale trachoma baseline prevalence survey in Shompole location of Magadi of the Rift Valley Province of Kenya which revealed a high prevalence of blinding trachoma; much higher

than previously assumed.^{3,4} The survey report acted as the "whistle blower" of possible serious level of blinding trachoma in the country. Kenya was listed as a priority for trachoma control by the World Health Organization (WHO) and the International Trachoma Initiative (ITI); the lead organizations in the global alliance for elimination of blinding trachoma by the year 2020 (GET 2020). Nationwide trachoma survey to quantify the actual burden of trachoma in Kenya has been initiated with the University of Nairobi as the principle investigator. The survey will be conducted in three phases of six districts each. The Government of Kenya in collaboration with a consortium of international and local eye care Nongovernmental Organisations (NGOs) have together committed large sums of resources towards national trachoma mapping and control in the whole country. Phase one was conducted in 2004 and results published in the East African Medical Journal.² 'SAFE with Zithromax' was officially launched in Kenya at a Masai traditional Manayatta in Amboseli location of Loitokitok district on Monday 10.07.2007 by Ministry of Health, AMREF and SSI among others.

Laikipia becomes the seventh district in Kenya to be surveyed for trachoma. It is one of the nineteen districts of Rift Valley Province and borders Samburu District to the north, Isiolo to the northeast, Meru Central to the south, Nyandarua and Nakuru Districts to the Southwest and Koibatek and Baringo districts to the west. It covers an area of approximately 9667 KM² and has a population of 415,136 people. Just before the survey, the district was subdivided into two to create Laikipia West and Laikipia East districts. Some parts of the district are arid and semi arid with scarce water resources and suffer drought due to scanty rains. Most rivers are seasonal forcing women and livestock to walk long distances in search of water. The district has some nomadic pastoralists and borders known trachoma endemic districts (Samburu, Baringo and Pokot). The objective of this survey was to estimate with reasonable precision the prevalence of active trachoma (TF) among children of age 1-9 years and the prevalence of potentially blinding trachoma (TT) among adults aged 15yrs and older in Laikipia.

METHODS

This survey was conducted from 22nd to 30th July 2007 by the Ministry of Health in collaboration with AMREF, Sight Savers International (SSI), University of Nairobi (UoN) and the local communities. Community mobilization was conducted by the District Health Management Team (DHMT). The standardized protocol developed by the International Trachoma Initiative in 2003 and endorsed by WHO was modified to suit local situation. WHO simplified trachoma grading was used for recording clinical findings. The survey team had sixteen enumerators. Nine were recruited from among the health workers from Laikipia district and seven from among the eye care workers from other districts with experience from previous surveys. A training workshop was

conducted. Data collection tools were field tested at Ilpolei sulocation of Mokogodo division of Laikipia East district. Sampling was done based on the population of the greater Laikipia district. All residents of Laikipia aged 1-9yrs and > 15yrs were eligible. The sample size was the same as the district samples in the 2004 survey.² The sampling exercise was supervised by a statistician and the details were as follows: for children 1-9yrs the TF prevalence estimate was 15%, precision + 5%, design effect = 4; adults > 15yrs: prevalence of TT 3%, precision + 1.5%, design effect = 2; confidence level for all samples was 95%. After accommodating 10% for non-response the team had to examine at least 900 children 1-9yrs for active trachoma (TF) and 1,200 adult > 15yrs for potentially blinding trachoma (TT). Twenty clusters (sub-locations) were selected using systematic sampling method with probability proportional to size (PPS). In every cluster, a minimum of three villages was randomly selected. All the villages were selected if a cluster had <3 villages. The cluster sample was proportionately distributed among the selected villages. A minimum of 3 homesteads were visited per village to ensure as wide a geographical coverage as possible. The predetermined sample was distributed proportionately among the selected clusters, villages and homesteads. All the occupants of selected households who fulfilled the survey criteria were enumerated and examined. Efforts were made to trace children in schools and adults who were within reach. Revisits were done where necessary. In case there was need to pick an extra village or households to achieve the minimum sample size, it was done using random selection method. Depending on the population distribution and density in a village, any of the random selection methods in the ITI standard trachoma survey protocol was used (Random walk, segmentation, systematic sampling, simple random and combinations). All completed data forms were delivered from the field to AMREF Kenya statistics office for data management and analysis. The survey team prepared both the preliminary and the final survey reports.

The ITI (International Trachoma Initiative) and the WHO consider TF prevalence equal to or above 10% and 5% for district and community respectively a public health problem (minimum prevalence criteria).^{5,6} In this study, TF prevalence >10% at district and >5% at sub-location levels in children 1-9 years old and prevalence of TT >1% in adults >15 years were considered a public health problem

RESULTS

A total of 348 households were visited and 1,017 children aged 1-9 years examined; 317 in Laikipia East and 700 in Laikipia West (table 1). The number of children with TF in the study population was 97: Laikipia East 47 and Laikipia West 50. Prevalence of TF in Laikipia is $97/1017 = 9.5\%$ (95% CI: 6.3-13.9); Laikipia East $47/317 = 14.8\%$ (95% CI: 8.2-24.9) and Laikipia West $50/700 = 7.1\%$ (95% CI: 3.9-12.3).

Table 1: Prevalence of TF in children aged 1-9 years in Laikipia district

Area	No. examined	Cases	Prevalence	95% CI
LAIKIPIA DISTRICT	1017	97	9.5%	6.3-13.9
Laikipia East	317	47	14.8%	8.2-24.9
Laikipia West	700	50	7.1%	3.9-12.3
SUB-LOCATIONS SURVEYED IN LAIKIPIA EAST				
1. Marura	56	0	0	
2. Ruguta	18	7	46.7%	5.9-83.9
3. Naibor	63	10	15.9%	3.5-43.5
4. Likii	78	3	3.8%	0.01-25.8
5. Muhonia	42	0	0	
6. Lamuria	31	0	0	
7. Thigio	68	6	8.8%	1.1-34.3
8. Mumonyot	15	7	46.7%	7.1-90.2
9. Ngarendare	20	14	70.0%	23.1-96.4
10. Kurikuri	20	6	30.0%	3.6-76.9
SUBLOCATIONS SURVEYED IN LAIKIPIA WEST				
11. Karaba	71	5	7.0%	0.6-31.4
12. Olmorani	48	6	12.5%	1.5-44.8
13. Manguo	60	3	5.0%	0.01-31.9
14. Losongwa	77	6	7.8%	0.9-31.1
15. Maina	109	1	0.9%	0.01-16.7
16. Pesi	37	8	21.6%	3.8-58.8
17. Muruku	48	3	6.3%	0.1-37.8
18. Mutara	19	2	10.5%	0.0-64.2
19. Maundu ni meri	60	10	16.6%	3.7-45.2
20. Melwa	77	0	0	

Girls have a higher prevalence of active trachoma (TF) than boys but the difference is not statistically significant ($p=0.788$).

The number of adults aged >15 years examined in was 1,225; 426 in Laikipia East and 794 in Laikipia West (table 2). The number of adults with TT in the study population was 14: Laikipia East 4 and Laikipia West 10. Prevalence of TT in Laikipia is $14/1225 = 1.1\%$ (95% CI: 0.5-2.4); Laikipia East $4/426 = 0.9\%$ (95% CI: 0.2-3.7) and Laikipia West $10/794 = 1.2\%$ (95% CI: 0.2-3.7).

Table 2: Prevalence of TT (and CO) in adults aged >15 years in Laikipia district

Area	No. examined	TT (CO) cases	TT Prevalence	95% CI
LAIKIPIA DISTRICT	1225	14 (9)	1.1%	0.5-2.4
Laikipia East	426	4 (9)	0.9%	0.2-3.7
Laikipia West	794	10 (3)	1.2%	0.5-3.1
SUBLOCATIONS SURVEYED IN LAIKIPIA EAST				
1. Marura	70	1 (0)	1.4%	0.0-14.5
2. Ruguta	26	0 (1)	0.0%	
3. Naibor	83	0 (0)	0.0%	
4. Likii	91	0 (0)	0.0%	
5. Muhonia	49	0 (0)	0.0%	
6. Lamuria	46	0 (1)	0.0%	
7. Mumonyot	21	0 (0)	0.0%	
8. Ngarendare	12	2 (1)	16.7%	0.9-63.5
9. Kurikuri	26	1 (3)	3.8%	0.0-33.3
SUBLOCATIONS SURVEYED IN LAIKIPIA WEST				
10. Thigio	82	6 (0)	7.3%	1.9-21.0
11. Karaba	63	1 (0)	1.6%	0.0-15.9
12. Olmorani	68	0 (0)	0.0%	
13. Manguo	78	1 (0)	1.3%	0.0-13.2
14. Losongwa	87	0 (1)	0.0%	
15. Maina	142	0 (1)	0.0%	
16. Pesi	48	0 (0)	0.0%	
17. Muruku	46	0 (0)	0.0%	
18. Mutara	21	1 (0)	4.8%	0.0-39.0
19. Maundu ni meri	63	1 (1)	1.6%	0.0-15.9
20. Melwa	98	0 (0)	0.0%	

Men have a higher prevalence of TT than women but the difference is not statistically significant ($p=0.653$).

DISCUSSION

Laikipia becomes the seventh district of Kenya to be surveyed for trachoma. The prevalence of TF in children 1-9 years old is 9.5% and hence not a public health problem. TT prevalence in adults >15 years is 1.1% which is a public health problem. The results are very similar to those of the neighboring Baringo and Meru districts where TF is not a district wide public health problem but TT is.²

In this study, girls had more active trachoma than boys but the difference was not statistically significant ($p=0.788$). In three trachoma surveys in Kajiado district, the opposite was reported: prevalence of TF in boys was higher (32.0%) than in girls (24.0%), p value 0.03; reasons not clear.^{2,3,4} The rest of the districts surveyed in 2004 had boys and girls equally affected. Men have more TT than women but the difference is not statistically significant. It is recorded in literature that prevalence of active trachoma is quite similar for male and female children.⁷ In West Pokot district, there were more women (7.2%) with TT than men (3.4%), p value 0.03. There was no significant statistical difference in the prevalence of TT between women and men in the rest of the previously surveyed districts.²

It was concluded that active trachoma is not a district wide public health in Laikipia hence

district-wide mass antibiotic distribution is not justifiable. However, there are pockets of endemic communities in the district which deserve mass treatment. All the suspected endemic sub-locations should be identified, surveyed and treated as indicated. Potentially blinding trachoma (TT) is a district wide public health. There is need for TT surgical services in the entire district.

ACKNOWLEDGEMENTS

The authors would like to thank the DHMTs of Laikipia East and Laikipia West for the great support in community mobilization and providing enumerators. We cannot forget to thank the Laikipia Provincial administration; Division of Ophthalmic services (DOS), AMREF, and Sight Savers International for technical and administrative support. Special thanks to Mr. Hezron Ngugi and Mr. Francis Dikir for excellent logistical support and Makena for secretarial support. A big thank you to the team leaders: Dr. Kagonda, Dr. Rono, Mrs. Dorcus Chelang'a, and Mr. Soine the team leaders. Mr. Kamau the survey statistician was of great help to us during sampling and data analysis.

REFERENCES

1. Karimurio J, VISION2020 "The Right to Sight Global Initiative", Editorial article, East Afr. Ophthalmol. J 2006;12:1-3
2. Karimurio J, Gichangi M, Ilako D, Kilima P and Adala H. Prevalence of trachoma in six districts of Kenya. East Afr. Med. J. 2006; 83: 63-68.
3. Karimurio J, Ilako F, Gichangi M. Trachoma control using SAFE with azithromycin: Afr. Med. J. 2007; 84: 127-135 Medical Journal)
4. Matende I, Kollman M, Karimurio J and Gaeckle M. The prevalence and pattern of trachoma in Shompole. Location, Magadi Division of Kajiado District, Kenya. Department of Ophthalmology; University of Nairobi postgraduate thesis (2003) (Not published).
5. International trachoma initiative standardised protocol for baseline prevalence survey for trachoma: www.trachoma.org.
6. Bruce G., Yinghui M., Vicky C., et al. Eradication may not be too high a goal for trachoma programs. Emerging Infect. Dis. 2003; 9: 596-598.
7. Gordon J., Minassian D. and Weale R. The epidemiology of Eye Disease. Chapman and Hall, London (1998).