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Active trachoma in children aged three to nine years in rural communities in Ethiopia: prevalence, indicators and risk factors

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Summary Trachoma is the most important infectious cause of blindness worldwide. In two rural populations in Ethiopia, a programme of preventative and treatment measures was initiated in May 2002. A baseline survey was conducted to evaluate the effect of this programme on the prevalence of active trachoma. A total of 1960 children aged 3—9 years, from 915 households in 40 communities, were examined for the presence of active trachoma. Demographic and household information was collected using questionnaires and household amenities and environmental conditions were observed. Overall, 72% of children had active trachoma. Twenty percent of children aged nine years had trachomatous scarring. In children, discharge in the eyes and flies on the eyes were significant indicators of trachoma (odds ratio [OR] = 3.0, 95% CI 1.94—4.55 and OR = 3.4, 95% CI 2.37—4.88, respectively). Frequency of washing children, a clean environment and hygienic disposal of excrement were significant preventative factors for active trachoma. Prevalence of active trachoma varies widely between and within districts. Risk factors comprise a mix of individual characteristics and household factors. This study demonstrates the need for broad target interventions and a flexible approach to the prevention of trachoma in high prevalence endemic rural populations.

1. Introduction

Trachoma is the most important infectious cause of blindness worldwide. An estimated 150 million people have active disease and six million people are blind as a result of the infection (Thylefors et al., 1995). Blindness from trachoma is a result

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of repeated episodes of active trachoma, which usually occur in childhood (Grayston et al., 1985). A high prevalence of active trachoma has been reported in children in countries of the Sahel, East Africa, Ethiopia and India. In recent studies, active trachoma was seen in 39% of children aged less than 10 years in Mali (Schemann et al., 2002), in 36.5% of children aged 2—6 years in Menofiya, Egypt (Ezz-al-Arab et al., 2001) and 51% of children aged less than 10 years in Ethiopia (Bejiga and Alemayehu, 2001).

Trachoma is a disease of poverty and tends to cluster within the poorest families (Mecaskey, 1998). Risk factors that have been implicated in the transmission of trachoma include the amount of water available to the household, poor hygiene and the presence of flies (Marx, 1989). In 1997, WHO launched the Global Alliance for the Elimination of Trachoma (GET) for the control of trachoma based on the 'SAFE' strategy (WHO, 1997). The strategy has four components: Surgery, Antibiotics, Face washing and Environmental sanitation. The public health challenge is in the delivery of the SAFE strategy to rural communities, often with inadequate water supply, to reduce the prevalence of active trachoma.

Since the introduction of the SAFE initiative there have been encouraging signs in the uptake of the programme (WHO, 2000). The International Trachoma Initiative (ITI) has a global intervention programme which includes improved trichiasis surgery, mass administration of azithromycin and the distribution of public health messages on trachoma disease and prevention using radio, video and printed materials. Evaluation of the effect of the programme on the prevalence of trachoma is important (Bailey and Lietman, 2001). This evaluation includes the process indicators for the initiative, changes in behaviour associated with the disease, and trachoma infection.

This paper reports on the prevalence of trachoma in 40 communities in rural Ethiopia prior to the implementation of the SAFE initiative. This study provides the baseline prevalence of trachoma and identifies factors associated with trachoma in children in these communities, which will be used to improve and inform the intervention.

2. Materials and methods

This study was undertaken in three zones of Ethiopia: Gurage, Oromia and South Welo. Oromia and South Welo are adjacent zones about 300 km northeast of Addis Ababa, a highland area inhabited predominately by people of the Oromia ethnic group. The Gurage ethnic group is predominant in the Gurage zone, a lowland area, about 160 km southwest of Addis Ababa. The survey was conducted in three districts where the SAFE intervention strategy was to be implemented, Enemore & Ener in the Gurage zone and Artuma Farsi and Dawa Chefa in the Oromia zone, and in two similar adjacent districts, Cheha in the Gurage zone and Kalu in South Welo zone. Thirty communities (*kebeles*) were selected by cluster randomization from within the intervention area and ten from the adjacent districts. A *kebele* consists of 5—10 villages and forms the basic administrative unit in Ethiopia with a population of between 2000 and 10 000 people. Villages were selected at random within each *kebele* for the survey.

The survey took place from March to May 2002, before the planned start of SAFE intervention activities. This is the dry season in Ethiopia when trachoma prevalence is high. The survey team included interviewers and ophthalmic nurses taken from the local area, who were familiar with the local language. All interviewers had completed secondary education to the age of 18 years and were trained in delivering a standard questionnaire. The ophthalmic nurses, experienced in community eye health prevention and treatment according to Ethiopian guidelines, received additional training from a community ophthalmologist for the survey.

In each *kebele*, 25—30 households were visited using survey methods similar to a study in Singida, Tanzania (Paxton, 2001). In each household, one adult carer was identified and asked to consent to a structured interview and an examination of all children aged 3—9 years in the household. The questionnaire included demographic details of both respondent and household, practical arrangements for washing, cooking and the care of livestock, and knowledge of health-related issues. The questionnaire was supplemented by observation of the household, including the toilet facilities and the presence of flies in and around the house.

All children in the study were seen by an ophthalmic nurse. The nurse observed the presence of flies on the child's eyes, and the cleanliness of the child using a standardized protocol. Discharge in the eyes and nose was noted and whether the child's hands and hair were clean. Hair was considered unclean if the scalp was evidently unwashed.

To examine the eye, the nurse inverted the upper eyelid of each child and scored for the presence of active trachoma and scarring sequelae using the simplified WHO criteria (Thylefors et al., 1987). In these criteria, follicular trachoma (TF) is identified if there are five or more follicles on the surface of the upper tarsal conjunctiva, and intense