Effect of SAFE Intervention on Pattern of Barriers to Trichiasis Surgery

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Abstract

Objective: Despite increasing availability of surgery for trachoma trichiasis, many people remain untreated. This study determined how the pattern of barriers to trichiasis surgery changes after intervention with the SAFE strategy (Surgery, Antibiotics, Facial cleanliness, and Environmental improvement).

Methods: Cross sectional trichiasis prevalence surveys were conducted in four areas across Ethiopia between 2002 and 2008 before and after receiving SAFE intervention. Individuals with trichiasis provided their reason as to why they were not operated and the most important barrier identified for each case. Baseline and follow-up proportions were compared under three categories: Awareness, Accessibility and Acceptability.

Results: A total of 571 cases were interviewed before the intervention and another sample of 247 people participated in the post intervention assessment. The overall coverage of trichiasis surgery was 41%. Women were three times more likely to be affected than men. Indirect cost (32%), lack of awareness (28%), false beliefs (17%) and lack of escort (11%) remained the leading barriers in the follow-up assessment. The proportion of ‘Accessibility’ barriers (cost and distance) fell significantly from 49.0% [Confidence Interval (CI): 44.0%; 54.0%] down to 35% [CI: 27.2; 42.3]. The relative contribution of ‘Acceptance’ and ‘Awareness’ barriers increased though these changes were not statistically significant.

Conclusion: Intervention with the SAFE strategy primarily improves accessibility to trichiasis surgery. However, acceptance and awareness related barriers standout to limit further uptake of services. Health promotion and counseling measures targeting women should be intensified in subsequent phases of SAFE.

Keywords: Accessibility; Acceptability; Barriers; Ethiopia; Trachoma

Introduction

Trachoma trichiasis is a condition in which one or more eyelashes from an in turned eyelid rub on a cornea [1]. It follows scarring of the tarsal conjunctiva from repeated inflammation caused by trachoma. Trichiasis may eventually lead to corneal opacity and blindness if uncorrected. Blinding trachoma is a leading preventable cause of blindness in the world [2]. Recent estimates showed that 40.6 million people are suffering from active trachoma and 8.2 million might have trichiasis [3]. Trachoma is the second most common cause of blindness in Ethiopia [4] where trichiasis affects 3% of people above 14 years of age [5].

The proportion of cases that eventually lose their sight from trichiasis is low. However, quality of life of most people with trichiasis is seriously affected by the disease. The discomfort from trichiasis results in an economic burden comparable to visual impairment caused by trachoma [6]. Surgical correction of the upper eyelid using tarsal rotation procedure is the most effective intervention for trichiasis [7]. The World Health Organization (WHO) has launched an initiative to eliminate blinding trachoma by the year 2020 using the SAFE strategy: Surgery, Antibiotic, Facial Cleanliness and Environmental improvement [8]. Eyelid surgery is a component of SAFE intervention. It provides relief from irritating pain in the eye and prevents vision loss from trachoma.

SAFE intervention makes surgical service available and disseminates health promotion messages to create demand for services. Awareness is the precondition for individuals to seek eye care while accessibility and acceptability of the intervention are the next essential components. Availability of trichiasis surgical services is increasing with the widening implementation of the SAFE strategy. Unfortunately, surgical coverage in affected communities in Africa is lower than 50% [9]. In trachoma endemic areas of central Ethiopia utilization of eye care services in general was found to be 27.8% [10]. Multiple behavioral, social and demographic factors prevent people from presenting for surgery. Cost, awareness, escort, distance, lack of time and fear of the operation are the commonly reported barriers to trichiasis surgery [9,10,15].

Few studies provided documented evidence on the impact of interventions on barriers to health services [10]. The effect of SAFE on the dynamics of barriers to trichiasis surgery is not well known. Investigating barriers helps to design better control strategies and service delivery mechanisms. The purpose of this study was to analyze changing patterns of barriers to trichiasis surgery as a result of intervention with SAFE strategy.

Methods

Setting

Ethiopia is a vast resource-poor country with a population of 80 million. The participants were trichiasis cases identified in community based surveys conducted between 2002 and 2008 in the following four trachoma program sites in rural Ethiopia.

a. Enemor & Ener district of Gurage Zone of Southern Region (2002/3 to 2004/5);

b. Adama and Boset districts of central Oromia Region (2004 to 2007);

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c. Borkena River Valley (Antsokia Gemza, Dawa Chefa and Artuma Fursi districts) trachoma program in Amhara Region (from 2004 to 2007);  

The SAFE trachoma control programs trained a number of integrated eye care workers to perform eyelid surgery. They provided trichiasis surgery at health centers and outreach sites in the villages. Different health education methods were used to promote SAFE services including trichiasis surgery. Hundreds of trained community health agents and women group leaders mobilized the community to participate in the ongoing SAFE program.

**Sampling**

All cases identified during baseline and follow-up trichiasis prevalence surveys were directly included in this study. Of the eight primary surveys, seven were cross sectional studies. They used conventional random cluster sampling techniques with average cluster effect of 1.5. The sampling method of these surveys is described in another paper [11]. Only the baseline study in 2002 in Enemor district employed rapid assessment method using self-reported cases of trichiasis. Fourteen out of 48 administrative units (Kebeles) were selected using simple random sampling method. The fourteen Kebeles had an estimated population of 14,520 people above 14 years of age of which 1510 reported trichiasis. Since 300 cases were adequate to assess barriers, every fifth case of trichiasis was selected for the baseline interview.

**Data collection**

A structured questionnaire was used to collect social, demographic data and barriers to utilization of trichiasis surgery services. The baseline format also included questions on knowledge, attitudes and practices towards trichiasis. A team of an ophthalmologist, two trained nurse and two enumerators collected the data following a one day training session on the study protocol. The trained nurses performed clinical assessments for trachoma using torch lights. At least one eye lash rubbing the cornea or evidence of epilation was taken as trichiasis according to the WHO classification [12]. Enumerators completed the questionnaires on barriers in a face-to-face interview. Cases were asked to report the most important barriers for not having had trichiasis surgery. Any of the three lead authors supervised the overall activity and confirmed diagnosis of ambiguous cases. People diagnosed with trichiasis were offered immediate surgery free of charge in the nearby health center. Additional information regarding input of resources, surgical coverage and prevalence of trichiasis were extracted from project monitoring and evaluation reports.

**Terms**

The following definition of terms was used to identify the key barrier and group it under one of the three categories. If people reported more than one barrier, the one top on the order of priority from A to C was taken as the prominent barrier.

A. **Awareness Related Barriers:** Lack of awareness about the serious blinding consequences of trichiasis; Lack of understanding that the condition is treatable and service is freely available.

B. **Accessibility Related Barriers:** Include Cost (the direct cost of surgery or the indirect cost of traveling to get services), and Distance (surgery site is too far to walk, takes much time, other means of transportation is not available).

C. **Acceptance Related Barriers:** The patient has awareness and no accessibility problems but is not willing to be operated. They

**Table 1:** Comparisons of basic characteristics of study populations on barriers to trichiasis surgery, 2006-2008, Ethiopia.

<table>
<thead>
<tr>
<th>Year of Assessment</th>
<th>Adama &amp; Boset (Oromia)</th>
<th>Borkena Valley (Amhara)</th>
<th>KA &amp; St. Ts. A. (Tigray)</th>
<th>Weighted Average</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Age (years)</td>
<td>45</td>
<td>43</td>
<td>48</td>
<td>46</td>
<td>50.7</td>
</tr>
<tr>
<td>Females (women)</td>
<td>81%</td>
<td>72%</td>
<td>82%</td>
<td>90%</td>
<td>77%</td>
</tr>
<tr>
<td>Illiterates</td>
<td>95%</td>
<td>89%</td>
<td>86%</td>
<td>85%</td>
<td>81%</td>
</tr>
<tr>
<td>Epilated eylashes</td>
<td>71.2%</td>
<td>33.7%</td>
<td>3%</td>
<td>39%</td>
<td>3%</td>
</tr>
<tr>
<td>Population 14+ (x1000)</td>
<td>53</td>
<td>57.3</td>
<td>103.5</td>
<td>112.5</td>
<td>162.4</td>
</tr>
<tr>
<td>Trachiasis cases</td>
<td>302</td>
<td>112</td>
<td>83</td>
<td>33</td>
<td>110</td>
</tr>
<tr>
<td>Prevalence of Trichiasis</td>
<td>10.4%</td>
<td>8.9%</td>
<td>3.4%</td>
<td>1.6%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Surgical Coverage</td>
<td>*</td>
<td>46%</td>
<td>*</td>
<td>27%</td>
<td>27%</td>
</tr>
</tbody>
</table>

*pNot determined

<table>
<thead>
<tr>
<th>Characteristic Factor</th>
<th>Enemor-Ener (SNNP)</th>
<th>Adama &amp; Boset (SNNP)</th>
<th>Borkena Valley (Amhara)</th>
<th>KA &amp; St. Ts. A. (Tigray)</th>
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</tr>
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<td>86%</td>
<td>85%</td>
<td>81%</td>
<td>73%</td>
</tr>
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<td>33.7%</td>
<td>3%</td>
<td>39%</td>
<td>3%</td>
<td>36.8%</td>
</tr>
<tr>
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<td>53</td>
<td>57.3</td>
<td>103.5</td>
<td>112.5</td>
<td>162.4</td>
<td>176</td>
</tr>
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<td>Trachiasis cases</td>
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<td>112</td>
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<td>33</td>
<td>110</td>
<td>67</td>
</tr>
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<td>2.8%</td>
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<td>27%</td>
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<td>*</td>
</tr>
</tbody>
</table>

**Table 2:** Barriers to trichiasis surgery, before and after intervention with the SAFE strategy, 2002/2006 to 2006/2008, Ethiopia.

<table>
<thead>
<tr>
<th>Categories: Barriers to Trichiasis Surgery</th>
<th>Enemor-Ener</th>
<th>Adama-Boiset</th>
<th>Borkena Valley</th>
<th>KA &amp; St. Ts. A.</th>
<th>Weighted Average</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>AWARENESS: on consequences, on availability of services</td>
<td>20</td>
<td>23</td>
<td>32</td>
<td>16</td>
<td>27</td>
<td>18</td>
</tr>
<tr>
<td>ACCESSIBILITY: Direct &amp; indirect costs, distance</td>
<td>204</td>
<td>50</td>
<td>38</td>
<td>9</td>
<td>40</td>
<td>18</td>
</tr>
<tr>
<td>ACCEPTANCE: Belief, Escort/support, Fear</td>
<td>78</td>
<td>39</td>
<td>13</td>
<td>8</td>
<td>43</td>
<td>31</td>
</tr>
<tr>
<td>Total TT Cases (n)</td>
<td>302</td>
<td>112</td>
<td>83</td>
<td>33</td>
<td>110</td>
<td>67</td>
</tr>
</tbody>
</table>

The weighted average of barriers recalculated based on the population of sampled areas is shown on Table 2. Acceptance related barriers became the prominent obstacles increasing from 31.9% [CI: 27.2; 36.8] at baseline to 37.4% [CI: 30.0 to 44.8] after the intervention. Accessibility barriers fall from 49.0% [44.0%; 54.0%] to 35.0% [27.7%; 42.3%] and this was statistically significant. Awareness related barriers relatively increased from 19.1% [15.2 to 23.1] to 27.6% [20.8% to 34.4%]. However, this was not significant. Figure 1 depicts the changes in pattern of barriers was significant only for accessibility barriers.
provide excuses related to beliefs, lack of escort or support, fear of surgery, other causes or no reason at all.

Analysis

Data entry, cleaning and basic statistical analysis was made using the Epi-Info version 6.0 statistical software. Weighted averages were calculated based on the prevalence of trichiasis in the respective area. The main analysis strategy was comparison of two proportions using 95% confidence interval limits. The difference between baseline and follow up proportions was considered significant if their confidence intervals did not overlap. The 95% confidence limits were adjusted for cluster effect of 1.5.

Ethical considerations

The studies were conducted after ethical clearance by Research and Publication Committees of respective teaching institutions. Also, administrative authorization was obtained from the respective District Health Offices. Each individual was asked to participate in the study after adequate explanations. The interviewer recorded and signed documents confirming verbal consent was received in front of a witness. Written consent was not taken because of the high rate of illiteracy among respondents.

Results

General findings

A total of 571 and 247 patients with trichiasis participated in the baseline and follow up assessment, respectively. All the trichiasis cases responded to the interviews. The two groups had similar characteristics (Table1).

Discussion

Introduction of SAFE intervention resulted in some changes on the pattern of barriers to trichiasis surgery. Awareness about availability and benefit of surgery has improved pursuant to the intervention. However, the changes were not significant. The coverage of health promotion messages might have been inadequate or methods of communication were not entirely effective. Accessibility of trichiasis services is mainly limited by the cost of surgery as observed in Tanzania [9], Gambia and Nigeria [13,14]. Surgical uptake increases when surgery is provided at villages due to lower transportation cost to the patient, time saved and less fear of the operation [15]. Accessibility changed significantly in our study areas due to the policy that rendered surgery free of charge. However, indirect cost remained a serious barrier as reported from northern Ethiopia [16].

Accepting immediate surgical intervention could be a difficult decision for patients from less educated communities where false believes myths and misconceptions are common. Some perceived that trichiasis surgery requires more food for recovery, and they preferred to wait for favorable conditions such as good harvest. Lack of escort or supporting person at home was a concern for single mothers with bilateral visual impairment from trichiasis. Neighbors may be busy or reluctant to take care of another household while the patient is away. Fear was reported by few individuals but the proportion might be higher as people are shy of talking about fear to strangers. We did not get many cases that complained of a bad outcome of surgery or being turned down at the service provision site. However, as much as 22% of cases in Tanzania reported they tried but couldn’t get surgery due to barriers on the provider’s side [9]. Assigning an adequate number of well-trained mid-level health workers is a cost effective approach used in many parts of Ethiopia [17].

Most of our cases were illiterate and middle aged females with limited access to resources. Women had up to four fold increased risk of living with trichiasis, which is more than double the global estimate [18]. It is known that women in rural areas are usually reluctant to accept trichiasis surgery [19]. Although most of our cases showed willingness to be operated, few would agree to take actual surgery. The use of peer pressure through happily operated cases might improve uptake of trichiasis services. Interventions improved acceptance of surgery from 16.9% to 44.8% in [9]. As women are more affected by trichiasis, relatively more women should get trichiasis surgery. Programs should always ensure gender equity in the provision of trichiasis surgery services [20].

The findings of this study are limited by its observational design and the relatively small sample sizes. The effect of SAFE could have been confounded by other factors such as socio economic changes in the areas. Comparison with other communities that have not been receiving SAFE would have provided stronger evidence. It assessed barriers on the community side but not the supply aspects of the service delivery system. However, the population-based surveys in multiple locations generated more realistic information than interviewing clinic attendants.

It can be concluded that SAFE intervention initially reduces accessibility (cost and distance) barriers to trichiasis surgery. Awareness and acceptance related barriers stand out as significant factors in subsequent phases. We recommend health education and promotion continues targeting women and house hold leaders with a focus on eliminating myths. Cost and distance barriers can be reduced by increasing geographic coverage of free village based trichiasis surgery. Preoperative counseling and home support could be used to address barriers related to fear of surgery and lack of escort. Program managers need to monitor the changing pattern of barriers and address them effectively in order to improve uptake of trichiasis surgery (Table 2) (Figure 1).

Acknowledgements

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Competing Interest

Authors have no financial conflict of interest in this study. Sponsors covered costs of data collection without being involved in conducting the actual study or production of this paper.
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