

Rapid assessment of trachoma in 9 governorates and Socotra Island in Yemen

T.K. Al-Khatib,¹ A.S. Hamid,¹ A.M. Al-Kuhlany,² M.H. Al-Jabal² and Y.A. Raja'a¹

التقييم السريع للتراحوما في تسع محافظات وفي جزيرة سُقُطْرَى في الجمهورية اليمنية
توفيق قائد الخطيب، عزيز شاهر حميد، عبد الله محمد الكحلاني، محمد حسن الجبل، يحيى أحمد رجاء

الخلاصة: استعرضت هذه الدراسة أنماط تبارز الأهداب داخل الجفن واحتكاكها مع القرنية، والتراحوما النشطة، وعوامل اختطار التراحوما في 9 محافظات بالجمهورية اليمنية وفي جزيرة سُقُطْرَى، باستخدام تقييم سريع خلال شهرَي تشرين الأول/أكتوبر وشباط/فبراير 2004. وتم فحص 3169 طفلاً تتراوح أعمارهم بين سنة وتسع سنوات في نقطة التقاء مركزية أو بالمنزل. وقد ظهر وجود تراحوما نشطة لدى نسبة كبيرة من الأطفال في محافظات الجوف، ومأرب، وشبوة، مما يجعل من الضروري توجيه استراتيجية SAFE أي جراحة انقلاب الجفن، والمعالجة بالمضادات الحيوية، ونظافة الوجه، وتحسين البيئة إلى هذه المحافظات. كما وجدت حالات تبارز الأهداب داخل الجفن واحتكاكها مع القرنية في حضرموت وتعز، مما يشير إلى أهمية توفير جراحات انقلاب الجفن في هذه المحافظات.

ABSTRACT This study described the pattern of trichiasis, active trachoma and trachoma risk factors in 9 governorates of Yemen plus Socotra Island, using a rapid assessment during October and February 2004. A total of 3169 children aged 1–9 years were examined in a central meeting point or at home. Active trachoma was found in a high percentage of children in Al-Jawf, Mareb and Shabwah governorates and the SAFE strategy (Surgery, Antibiotic treatment, Facial cleanliness, Environmental improvement) should be directed toward these governorates. Trichiasis cases were also found in Hadramout and Taiz, suggesting that eyelid surgery should be provided in these governorates.

Évaluation rapide du trachome dans 9 gouvernorats et dans l'île de Socotra au Yémen

RÉSUMÉ La présente étude décrit les caractéristiques du trichiasis et du trachome évolutif ainsi que les facteurs de risque de trachome dans 9 gouvernorats du Yémen et dans l'île de Socotra, à partir d'une évaluation rapide effectuée durant les mois de février et d'octobre 2004. Au total, 3169 enfants âgés de 1 à 9 ans ont été examinés dans un point de rencontre central ou à domicile. Un trachome évolutif a été observé chez un fort pourcentage d'enfants dans les gouvernorats d'Al-Jawf, de Mareb et Shabwah et la stratégie CHANCE (Chirurgie, Antiobiothérapie, Nettoyage du visage et Changement de l'Environnement) devrait donc être focalisée sur ces gouvernorats. Des cas de trichiasis ont également été trouvés à Hadramout et Taiz, ce qui semble indiquer que la chirurgie des paupières devrait être assurée dans ces gouvernorats.

¹Faculty of Medicine and Health Sciences, University of Sana'a, Sana'a, Yemen (Correspondence to T.A. Al-Khatib: tawfik234@yahoo.com).

²Ministry of Public Health and Population, Sana'a, Yemen.

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Introduction

Today, trachoma is still found in underprivileged communities with poor living conditions. The World Health Organization (WHO) calculated that blinding trachoma is still present in 46 countries, encompassing 150 million people. Yemen is one of these countries [1]. It is estimated that 15% of the blindness in the world is caused by trachoma [2]. The disease is found mainly in remote rural areas of most African countries and in several Eastern Mediterranean Region countries such as Saudi Arabia [3], Egypt [4], Sudan [5], Oman [6] and Yemen [7]. The Egyptian study revealed a prevalence of active trachoma of 36.5% among preschool children [4]. In Yemen, a seroprevalence study of *Chlamydia trachomatis* infection among schoolchildren in rural and urban Sana'a revealed a rate of 45.9%. The rate was higher among rural (73.2%) than urban children (23.1%) [7].

The risk factors that predispose to infection are mostly environmental and poor hygiene practices. The major risk factors are overcrowding, absence of a latrine [8], a home of wood and earth [9], poor personal hygiene and keeping animals within the dwelling [10]. When assessing trachoma at the community level, it is important to consider both the inflammatory disease in children and the potentially blinding complications (i.e. trichiasis) in adults.

Several rapid assessments have been carried out in different countries. An assessment conducted in Ethiopia showed that more than half (51.1%) of the children aged 10 years or less had active trachoma [11]. On the other hand, active trachoma and trachomatous trichiasis each were found in 5.5% of individuals older than 10 years of age. Most of the households (97.6%) had no latrine and of the few that had one, only two-thirds of the occupants used it.

In Burkina Faso, the presence of flies on children's face and dirty faces were strongly associated with the rate of trachoma [12].

No national trachoma assessment survey has previously been reported in Yemen. Therefore, the need for a country-wide rapid assessment in order to control for the disease is evident. Our study aimed to prioritize governorates by the rate of active trachoma and to describe the pattern of trichiasis, active trachoma and trachoma risk factors.

Methods

A survey of trachoma using rapid assessment methodology was conducted during October 2003 to February 2004 in 9 out of the 22 governorates of Yemen. Data about environmental factors were collected from households, while demographic and clinical data were collected from children and elderly people.

Sample selection

The selected governorates were: Mareb, Shabwah, Hadramout, Ibb, Taiz, Al-Jawf, Al-Hodiedah, Abyan, Lahj and Socotra Island. The selection of the governorates was the outcome of a 3-day workshop during September 2004. Reports of the Ministry of Public Health and judgements of senior experienced ophthalmologists were reviewed and discussed by the assessment team together with a WHO expert. The selection involved all 5 governorates where cases of active trachoma are frequently reported, plus another 4 governorates selected randomly from the list of governorates where active trachoma is rarely reported, plus Socotra Island. The selection technique was made according to the guidelines for rapid assessment for blinding trachoma [13].

In each governorate, communities/villages were selected when at least 1 of the following criteria applied:

1. Uncertain situation or suspicion of trachoma, based on a previous review or analysis.
2. Evidence of trachoma from previous reports or from key informants (using the field visit to validate the information derived from the previous review).
3. Isolated community of less than 500 people, with special attention to minorities and marginalized mobile or migrant population groups or tribes.
4. No easy or permanent access to water.
5. Primary health care services are weak, irregular or non-existent.
6. No school present in the community.

Children included in the rapid clinical assessment were aged 1–9 years old and selected from at least 15–20 households/compounds. In areas where villages consisted of continuous households with a well-structured neighbourhood, we surveyed 15–20 households in one section or in each neighbourhood. In areas where villages consisted of widely spaced households, scattered households were assessed until the required sample size of 50 children was reached. If a selected village did not have enough children to reach the sample size, we examined all the children present. At least half of the 50 children were pre-school children.

Data collection and analysis

A total of 3169 children between the ages of 1–9 years were examined for the signs of active trachoma. The examination was conducted in a central meeting point or at home and each eye was examined separately. The assessment of active trachoma and trichiasis was made according to the WHO simplified trachoma grading system [13] by

a team consisting of an ophthalmic consultant, ophthalmologist and a candidate for the diploma in ophthalmology. The team used a binocular loupe with $\times 2.5$ magnification.

Elderly people with trichiasis, entropion and corneal opacities were also searched for and recorded when encountered.

Environmental risk factors were operationally defined as: absence of latrine, presence of solid waste within the dwelling and inaccessible water supply (more than 30 minutes walk). Personal hygiene was operationally defined by unclean face; that is, if flies were observed on the face or discharges were seen on the eye or the nose. Both environmental factors and unclean faces were identified by observation.

Data were processed using SPSS to calculate frequencies and percentages.

Results

Active trachoma was found to affect a high percentage of children in 3 of the governorates: Al-Jawf (48.0%), Mareb (25.0%) and Shabwah (17.0%). The trachoma rates were much lower in Ibb (6.0%), Hadramout (5.0%) and Al-Hodeidah (4.0%), where some districts were also affected by active trachoma: Sayon, Al-Makhader, Al-Udain and Al-Doraihem. Trachoma rates were very low in Abyan (0.9%), Lahj (0.9%), Taiz (0.9%) and Socotra (0.7%) (Table 1).

The percentage of children with unclean faces followed a similar pattern to the governorates with active trachoma: Al-Jawf (41.7%), Mareb (37.7%) and Shabwah (30.3%) had the highest rates, followed by Al-Hodiedah, Abyan, Taiz, Ibb, Lahj, Socotra Island and Hadramout (Table 1). The percentage of children with unclean faces was found to correlate positively with the percentage with active trachoma ($r = 0.92$).

Table 1 Clinical and environmental rapid assessment of trachoma in 9 governorates of Yemen plus Socotra Island

Governorate	Total children examined		Clinical assessment		Trichiasis cases in community	Total households visited	Environmental assessment		
	No.	%	Children with active trachoma	Children with unclean faces			Absence of latrine	Solid waste	Water > 30 min. walk
Al-Jawf	302	48.0	41.7	5	143	88.1	19.6	18.9	
	313	25.0	37.7	14	148	1.4	87.2	0.0	
Shabwah	333	17.0	30.3	5	242	72.3	76.4	81.9	
	313	5.8	13.2	0	133	18.8	0.0	29.3	
Hadramout	315	5.0	10.5	9	94	65.4	81.9	0.0	
	319	4.0	22.9	0	129	88.4	76.7	0.0	
Abyan	322	0.9	16.5	2	203	20.7	58.2	36.0	
	313	0.9	11.2	1	168	50.6	74.5	0.0	
Taiz	332	0.9	15.1	7	171	32.8	73.7	0.0	
	300	0.7	10.7	0	116	71.7	8.3	0.0	

Cases of trichiasis among older people were found in the 3 governorates with high rates of active trachoma (Jawf, Mareb and Shabwah) but also in governorates with low rates of trachoma (Hadramout and Taiz), and to some extent in Abyan and Lahj. No trichiasis cases were found in Al-Hodiedah, Ibb or Socotra Island (Table 1).

The risk factors of trachoma such as presence of solid waste and houses with no latrines were found in a higher proportion of households in the endemic governorates of Al-Jawf, Mareb and Shabwah (Table 1). For example, in Al-Jawf latrines were not available for 88.1% of the population, in Mareb 87.2% of household had solid waste from animals, while the situation in Shabwah was worse with latrines lacking in 72.3% and solid waste seen in 76.4% of households. These 3 governorates also had the highest proportion of children with unclean faces.

Discussion

The assessment showed that Al-Jawf, Mareb and Shabwah had the highest rates of active trachoma and are thus high priority governorates for application of the "SAFE" control strategy among the investigated governorates. The SAFE strategy for trachoma control comprises Surgery, Antibiotics, Facial cleanliness and Environmental hygiene [14]. Some districts in Hadramout, Ibb and Al-Hodiedah were also affected by active trachoma and therefore treatment with topical tetracycline or systemic azithromycin (the "A" component of the SAFE strategy) can be recommended in these areas.

It was expected during the deskwork phase that Hadramout and Al-Hodiedah would rank among the highly affected areas, as Hadramout governorate lies on the desert line and Al-Hodiedah has reported a very high rate of active trachoma and trichi-

asis cases. The rapid assessment found, however, that there is better coverage with standpipe water in the 2 governorates than in other governorates. As findings from the field sometimes revealed that our predictions were not reliable, the situation in the other governorates need to be assessed in the field, especially Sa'da and Al-Mahara, where environmental conditions are suitable for transmission.

The number of trichiasis cases was found to be high in Hadramout, Mareb, Taiz, Al-Jawf and Shabwah. In view of the rate of active trachoma it is clear that Mareb, Al-Jawf and Shabwah governorates have suffered and are still suffering from this health problem. This confirms the need for focusing the full SAFE control programmes in these 3 governorates. However, while the rate of active trachoma is not so high in Hadramout and Taiz governorates, the high number of trichiasis cases found in these 2 governorates suggest that surgery (the "S" component of the SAFE strategy) should also be directed to these governorates.

The current assessment revealed a very high positive correlation between the rate of unclean faces and the rate of active trachoma. Unclean faces were observed in Al-Jawf, Mareb, Shabwah, Al-Hodiedah, Abyan and Taiz in descending order. The control programme in these areas should focus on health education about cleanliness and availability of safe water sources within a suitable distance (the "F" and "E" component of the SAFE strategy).

Community risk factors, i.e. unavailability of a water source within a suitable distance and deficiency in functioning latrines, were predominant in the governorates most affected by active trachoma. However, there were anomalies. For example, while Mareb governorate currently enjoys good water access and presence of latrines, it still has a

high share of the burden of active trachoma. This could be attributed to the continuous contact with animals in the houses. Therefore, the control strategy in this governorate should focus on health education, drug availability and surgery.

Recommendations

- To assess the situation in the other governorates which have environmental and social similarities with the endemic areas investigated here (e.g. Al-Mahara and Sa'da governorates).
- To implement the SAFE control strategy in the 3 high priority governorates: Al-Jawf, Mareb and Shabwah. To consider applying SAFE to some districts in Hadramout, Ibb, Taiz and Al-Hodiedah.

- To focus on health education about cleanliness in Mareb.
- To provide access to eyelid surgery in Hadramout and Taiz governorates as these were high transmission areas in the past.

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Strategy to eliminate blinding trachoma

Trachoma is one of the oldest infectious diseases known to mankind. It is caused by *Chlamydia trachomatis* which spreads through contact with eye discharge from the infected person (on towels, handkerchiefs, fingers, etc.) and through transmission by eye-seeking flies. After years of repeated infection, the inside of the eyelid may be scarred so severely that the eyelid turns inward and the lashes rub on the eyeball, scarring the cornea. If untreated, this condition leads to the formation of irreversible corneal opacities and blindness.

Blinding trachoma is avoidable. The strategy to eliminate the disease is based on: eyelid surgery, antibiotics to treat the infection, education about facial cleanliness and personal hygiene and environmental improvements.

Community development and intensified action by WHO's Global Alliance for the Elimination of Blinding Trachoma by 2020, has reduced the number of people with blinding trachoma. The estimated number of people affected has fallen from 360 million people in 1985 to approximately 80 million people in 2006.

Documents and publications from the Global Alliance for the Elimination of Trachoma can be accessed at: <http://www.who.int/blindness/publications/get2020/en/index.html>.