

Distichiasis and dysplastic eyelashes in trachomatous trichiasis cases in Oman: a case series

R. Khandekar,¹ S. Kidiyur² and A. Al-Hais³

ازدواج وخلل تنسج الأهداب في حالات الشعرة الناجمة عن التراخوما في عُمان: سلسلة من الحالات
راجيف خانديكار، ساتيش كيديور، عبد اللطيف الرايسي

الخلاصة: تعد الدراسة تقييماً استباقياً لمعدل انتشار ازدواج وخلل تنسج الأهداب بين المصابين بالشعرة الناجمة عن التراخوما في وحدة رأب العين في أحد مستشفيات عُمان في فترة استغرقت ثلاثة شهور عام 2000. فقد فحص طبيب عيون متخصص برأب العيون هذه الحالات وأجرى لها تصويراً فوتوغرافياً باستخدام مجهر بيولوجي. ومن بين المرضى الثمانين المدروسين كان لدى 58 مريضاً (72.5%) أهداب غير سوية بالإضافة إلى شعرة ناجمة عن التراخوما. وقد كان معدل ازدواج الأهداب 13.8% (بفاصلة ثقة 95% وتراوح بين 6.2% و21.3%) أما خلل تنسج الأهداب فقد كان 33.8% (ويتراوح بين 23.5% و44.1%)، فيما عانى 25% منهم (15.5% إلى 34.5%) من كلا الأمرين معاً. وقد كان انتشار ازدواج وخلل تنسج الأهداب أكثر من انتشار الشعرة الناجمة عن التراخوما لدى من يزيد أعمارهم على خمسين عاماً ولدى المصابين بالشعر الداسلي. إن وجود ازدواج ورسول تنسج الأهداب مع حالات الشعرة الناجمة عن التراخوما يتطلب المزيد من الدراسات لتوكيد هذه الملاحظة والتأكد من الترابط السببي بينهما.

ABSTRACT The study was a prospective evaluation of the prevalence of distichiasis and/or dysplastic eyelashes among trachomatous trichiasis cases at the oculoplasty unit of a hospital in Oman over 3 months in 2000. An oculoplasty surgeon examined and photographed cases using a bio-microscope. Out of 80 cases, 58 (72.5%) had abnormal eyelashes in addition to trachomatous trichiasis. The rate of distichiasis and dysplastic lashes were 13.8% (95% CI 6.2%–21.3%) and 33.8% (95% CI 23.5%–44.1%) respectively; 25.0% (95% CI 15.5%–34.5%) had both. Dysplastic and distichiasis eyelashes were significantly more prevalent in trachomatous trichiasis cases aged < 50 years and those with entropion. Presence of distichiasis and/or dysplastic eyelashes in trachomatous trichiasis cases warrants further analytical studies to confirm the observation and establish any causal association.

La distichiasis et les cils dysplasiques dans les cas de trichiasis trachomateux à Oman : série de cas

RESUME Cette étude était une évaluation prospective de la prévalence de la distichiasis et/ou des cils dysplasiques chez les cas de trichiasis trachomateux au Service d'oculoplastie d'un hôpital à Oman, portant sur 3 mois en 2000. Un spécialiste de chirurgie oculoplastique a examiné et photographié des cas à l'aide d'un biomicroscope. Sur les 80 cas, 58 (72,5 %) avaient des cils anormaux en plus d'un trichiasis trachomateux. Le taux de distichiasis et de cils dysplasiques s'élevait à 13,8 % (IC 95 % : 6,2-21,3 %) et à 33,8 % (IC 95% : 23,5-44,1 %) respectivement ; 25,0 % (IC 95% : 15,5-34,5 %) avaient les deux. La distichiasis et les cils dysplasiques étaient significativement plus courants chez les cas de trichiasis trachomateux âgés de plus de 50 ans et les cas d'entropion. La présence de distichiasis et/ou de cils dysplasiques dans les cas de trichiasis trachomateux justifie la réalisation d'autres études analytiques pour confirmer cette observation et établir toute association causale.

¹National Eye Health Care Programme; ²Oculoplasty Unit, Department of Ophthalmology, Al Nahdhah Hospital; ³Ophthalmic Services, Ministry of Health, Muscat, Oman.

Received: 15/09/02; accepted: 01/06/03

Introduction

Trachomatous trichiasis as graded by the World Health Organization (WHO) does not specify the presence of distichiasis and dysplastic eyelashes and limited information is available about these conditions among trachomatous trichiasis cases. In a long-term follow-up study of trachomatous trichiasis cases managed by the bilateral tarsal rotation procedure in Oman, the prevalence of distichiasis and dysplastic eyelashes were not noted [1]. The 61.8% recurrence rate of trichiasis observed in that study is very high and clinicians have proposed that this is due to dysplastic and distichiasis eyelashes which were not managed separately in addition to the bilateral tarsal rotation procedure. Our study was therefore undertaken to determine the frequency and determinants of dysplastic and distichiasis eyelashes among trachomatous trichiasis cases in Oman.

Methods

This was a case series study based at the Oculoplasty Unit of Al Nahdhah Hospital in Muscat, Oman. The study included all trachomatous trichiasis cases reporting to the unit between May 2000 and August 2000.

The field investigator was an oculoplasty surgeon. The ocular status of each patient was evaluated using a bio microscope with an attached photography unit. Patients' eyes were photographed after taking their written consent. The following were noted for each patient: personal details (age, sex), date of examination, details of trichiasis, past history of lid surgery, type of trichiasis, eye involved, presence of distichiasis or dysplastic lashes.

The trachoma gradings recommended by WHO in the 10th revision of the *International classification of diseases* [2] were

used to define the eye conditions. Distichiasis was defined as the presence of an additional row of eyelashes at the lid margin. Dysplastic eyelash (Figure 1) was defined as any abnormal eyelash originating from the area of the lid margin posterior to the grey line or at the conjunctival edge of the lid margin of an in-turned eyelid. Presence of abnormal eyelashes in either eye was counted as one person with abnormal eyelashes.

The patients were offered laser treatment free of cost at the time of examination and then given bilateral tarsal rotation surgery.

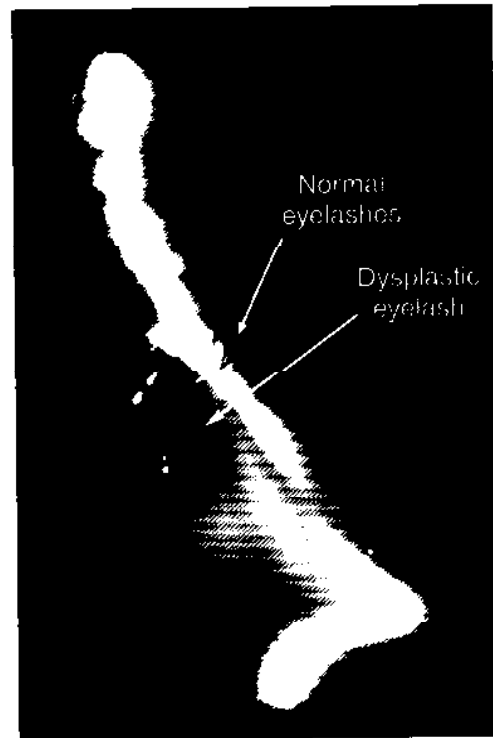


Figure 1 Dysplastic eyelashes in left upper lid with trachomatous trichiasis

The data were collected on a standard form and entered into a *Microsoft Excel 2000* database. Two researchers computed the data separately using a pre-tested format. The frequency and percentage of patients and 95% confidence intervals were calculated. Relative risk (RR) and *P* values were calculated for comparison of sub-groups.

Results

Eighty (80) trichomatous trichiasis cases were examined, 23 males and 57 females. They were divided into age groups < 50 years and 50+ years. Females in the age group 50+ years were the largest group in the study (Table 1).

Distichiasis and/or dysplastic eyelashes were observed in 58 (72.5%) of trichomatous trichiasis cases (Table 2). Analysing the data by sex showed that 17 of 23 male cases (73.9%) had abnormal eyelashes (distichiasis or dysplastic lashes) compared with 41 of 57 female cases (71.9%). Male cases had higher rates of dysplastic and distichiasis lashes than female cases. However, the difference was not statistically significant.

Table 1 Age-sex distribution of trichomatous trichiasis cases and age distribution of cases with abnormal eyelashes

Age (years)	Male No.	Female No.	Total No.	Abnormal eyelashes	
				No.	%
25-49	7	15	22	20	90.9
50+	15	41	56	38	67.9
NR	1	1	2	0	
Total	23	57	80	58	72.5

NR = not recorded.

Table 2 Abnormal (distichiasis and/or dysplastic) and normal eyelashes among 80 patients with trichomatous trichiasis

Condition of eyelashes	No.	%	95% CI
<i>Abnormal eyelashes</i>			
Distichiasis	11	13.8	6.20 to 21.30
Dysplastic eyelashes	27	33.8	23.49 to 44.11
Both of above	20	25.0	15.51 to 34.49
Total	58	72.5	62.72 to 82.28
<i>Normal eyelashes</i>			
	22	27.5	17.72 to 37.28

n = total number of cases.

Analysing the data by age group (Table 1) showed that 20 of 23 cases < 50 years old (90.9%) had abnormal eyelashes (7 distichiasis, 5 dysplastic lashes, 8 both) compared with 38 of 56 cases aged 50+ years (67.9%) (13 distichiasis, 6 dysplastic lashes, 19 both). The relative risk for abnormal eyelashes among those < 50 years was 1.3 (95% CI: 1.03-1.66) compared with those aged 50+ years.

Of 59 cases of trichomatous trichiasis with a history of lid surgery in the past, 46 (78.0%) had abnormal lashes. However, the presence of abnormal eyelashes with past lid surgery was not significant.

The severity of trichomatous trichiasis cases was graded as 'in-turned eyelashes only' (no entropion) or 'in-turned lid margin' (entropion). The distribution of abnormal eyelashes by the severity of trichomatous trichiasis is given in Table 3. Severe distichiasis/dysplastic eyelashes were seen in a significantly larger proportion of cases with entropion than those with trichiasis only.

Table 3 Abnormal (distichiasis and/or dysplastic) and normal eyelashes among patients with trichomatous trichiasis by severity of trichiasis

Condition of eyelashes	Severity of trichiasis			
	No entropion (n = 14)		Entropion (n = 66)	
	No.	%	No.	%
<i>Abnormal eyelashes</i>				
Distichiasis	0	0.0	20	30.3
Dysplastic eyelashes	1	7.1	10	15.2
Both of above	6	42.9	21	31.8
Total	7	50.0	51	77.3
<i>Normal eyelashes*</i>				
	7	50.0	15	22.7

*RR = 1.55; P = 0.05 (2-tailed Fisher exact test).
n = total number of cases.

Discussion

Oman is a trachoma-endemic country (Thylefors B, unpublished report). The national prevalence of trichomatous trichiasis has been recorded as 1.1% [1]. The bilateral tarsal rotation procedure for managing trichomatous trichiasis cases has been shown to have a recurrence rate of 23% as a short-term outcome and 60% as a long-term outcome in Oman [3,4]. The present study attempted to determine the prevalence of distichiasis and dysplastic eyelashes among trichomatous trichiasis cases.

The trichomatous trichiasis cases seen at the tertiary ophthalmic centre of Oman are likely to be cases in the advanced stages and thus they are not representative of all the trichomatous trichiasis cases of Oman. The oculoplasty surgeon used standard definitions to minimize the chances of misclassification bias. Use of records to determine the past history, and other factors related to exposure, minimized the recall bias. Age-sex stratification enabled us to control for these and other unknown con-

founders in the study. Thus, the outcome of the study is likely to be true picture of the examined sample.

The study showed that a large proportion of the trichomatous trichiasis cases had dysplastic eyelashes and/or distichiasis. Dysplastic and distichiasis eyelashes were more common in the younger age group as well as those having entropion. Even though male trichomatous trichiasis cases had a higher rate of these conditions, the difference was not statistically significant.

Ocular conditions with chronic irritation, such as Stevens-Johnson syndrome, ocular pemphigoid and the sequel of chemical burns to the eyelids and conjunctiva are known to cause metaplasia of the conjunctiva and skin cells and dysplastic eyelashes [5]. *Chlamydia trachomatis* causing chronic conjunctivitis with elements of scarring also could cause similar metaplastic changes resulting in the growth of eyelashes at aberrant places. Thus a causal association of dysplastic and distichiasis to the chronic trachoma infection might be a possibility.

Trichomatous trichiasis as a cause of chronic irritation resulting in dysplastic cyclash could not be established in this study as no temporal relation could be noted because both events occurred at the time of examination.

Oman has a high prevalence of genetic disorders [6]. It has a high level of risk factors, such as consanguinity, which are known to be responsible for different genetic disorders [7]. The extent and kinetics of genetic change in the outer membrane protein (omp-1) gene of *C. trachomatis* in endemic areas of trachoma suggested a possible association at the molecular level between the trachoma organisms and the host susceptibility [8,9]. Thus, genetic and molecular alterations might influence the cellular response to *C. trachomatis* infection in the Omani population.

Different types of human leukocyte antigen (HLA) markers for blinding trachoma in Oman have been observed [10]. They could be responsible for the different responses to trachoma organisms at molecular level. The abnormal cell growth resulting in blinding trachoma cases might be linked to different HLA markers.

These observations suggest that acquired factors might be changing the host cellular environment causing an altered response to *Chlamydia* spp. organisms.

The findings of the present study in the presence of the above-mentioned biologically plausible corroborative evidence favours the hypothesis of a causal link between trichomatous trichiasis and dysplastic and distichiasis. Further analytical epidemiological studies with larger sample are needed.

Acknowledgements

The authors are thankful to the Ministry of Health and the staff of Al Nahdhah Hospital for their support. A special thanks to Mr Salah Al Harby and Mr Henry Doss for assisting in compiling the information. The authors acknowledge the active participation of the patients in this study.

The preliminary report of first 30 cases was presented in at the Third Meeting of the Global Alliance for the Elimination of Trachoma held at Geneva in December 2000.

References

1. Khandekar R et al. The prevalence and causes of blindness in the Sultanate of Oman: the Oman Eye study (OES). *British journal of ophthalmology*, 2002, 86: 957-62.
2. *International Statistical Classification of Diseases and Related Health Problems, 1989 Revision. ICD-10*. Geneva, World Health Organization, 1992.
3. Khandekar R, Mohamed AJ, Courtright P. Recurrence of trichiasis: a long-term follow-up study in the Sultanate of Oman. *Ophthalmic epidemiology*, 2001, 8:155-61.
4. Reacher MH et al. A controlled trial of surgery for trichomatous trichiasis of the upper lid. *Archives of ophthalmology*, 1992, 110:667-74.
5. Kanski JJ. *Clinical ophthalmology: a systematic approach*, 4th ed. United Kingdom, Reed Educational and Professional Publishing, 1999:3.
6. Al-Riyami AA et al. A community based study of common hereditary blood disorders in Oman. *Eastern Mediterranean health journal*, 2001, 7(6):1004-11.

7. Sulaiman AJ et al. Oman Family Health Survey, 1995. *Journal of tropical pediatrics*, 2001;47(suppl.1):1-33.
8. Smith A et al. OmpA genotypic evidence for persistent ocular *Chlamydia trachomatis* infection in Tanzanian village women. *Ophthalmic epidemiology*, 2001, 8:127-35.
9. Hayes LJ et al. Extent and kinetics of genetic changes in the omp 1 gene of *Chlamydia trachomatis* in two villages with endemic trachoma. *Journal of infectious diseases*, 1995, 172:268-72.
10. White AG et al. HLA antigens in Omanis with blinding trachoma: markers for disease susceptibility and resistance. *British journal of ophthalmology*, 1997, 81: 431-4.

Note from the Editor

We wish to draw the kind attention of our potential authors to the importance of applying the editorial requirements of the EMHJ when preparing their manuscripts for submission for publication. These provisions can be seen in the *Guidelines for Authors*, which are published at the end of every issue of the Journal. We regret that we are unable to accept papers that do not conform to the editorial requirements.