

Clinical aspects of corneal trachoma

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SUMMARY Classification of trachoma by site rather than density of opacities is better related to visual prognosis and helps in selection for graft surgery. The cases are divided into 3 groups: peripheral corneal opacities, central corneal opacities, and diffuse corneal opacities (ground-glass cornea). A central lesion has the poorest prognosis, especially in children.

Trachoma remains a common clinical problem in Qatar. In most cases the end result does not entail residual disability (Wood and Dawson, 1967; Jones, 1975), but severe and neglected cases with secondary bacterial infection put the globe and cornea at risk (Maichuk, 1972) and blindness may ensue.

The present study, based on a series of Qatari cases, shows how significant the corneal lesion is in visual prognosis (Mathur and Sharma, 1970). Parameters of possible prognostic value are suggested.

Materials and methods

The present material comprises all adult patients (over 12 years of age) with trachomatous corneal lesions who attended the Eye Clinic at Rumelih General Hospital, Doha, State of Qatar, within a 5-year period (1967 to 1971). The series investigated consisted of 2603 patients (3656 eyes).

Information on the patients investigated was obtained from the personal case sheets, which detailed both personal and ophthalmic data. The socioeconomic conditions of the patient were carefully evaluated, because the living conditions in Qatar vary from relatively modern homes with electricity and running water to baked mud-and-stone houses with inadequate sanitation.

PHOTOKERATOGRAPHY

This method was employed to gather permanent records of corneal involvement by photographing the reflected image of a Placido disc. Initially, photographs were taken through a self-illuminated (Keeler) Keratoscope using an SLR camera with

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50 mm f3.5 lens and Kodak Tri-X (ASA 400) film. Later a CU5 Polaroid camera was used with a 3-in (75-mm) lens on 3× extension tubes (Fig. 1).

A large Placido disc was placed in front of the patient's eye at a distance equal to the length of the focusing frame, and the patient was asked to fixate the centre of the disc. The camera was placed in contact with the back of the disc, and a 5-in (125-mm) lens with a synchronised flash unit (using a Y-cord) was placed 15 in (38 cm) behind the patient's head on the side of the eye being photographed at a 45° angle to the disc, and aimed at its centre.

Results and discussion

INCIDENCE

From January 1967 to December 1971 inclusive, 18 000 adult patients were examined in the Eye Clinic (males:females, 1.4:1.0). There were 1471 males (14%) and 1132 females (15%) with trachomatous corneal opacities. On average, 521 new

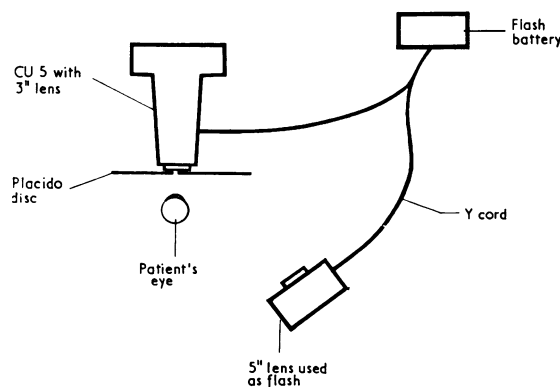


Fig. 1 Arrangements for photography

patients with trachomatous corneal lesions were seen annually in an ophthalmological unit serving a population of about 180 000, i.e., 2.9/1000.

In 1962 a committee of experts concluded: 'In countries where the whole population is afflicted by trachoma and seasonal conjunctivitis, more than 1.0% are totally blind, more than 4.0% are economically blind, and more than 10% have serious impairment of vision' (World Health Organisation, 1962).

Hussein, in a survey in the New Valley, Egypt, where trachoma affects the total population, found corneal lesions in 9.0% of cases (Hussein, 1974). A recent Indian survey showed that trachomatous corneal opacities occurred in 4.3% of cases (Awasthi *et al.*, 1974).

AGE AND SEX DISTRIBUTION

The age and sex distribution of the total series of trachomatous corneal opacities are shown in Table 1.

The number of patients with corneal opacities rises with increasing age, reaching a maximum in the age group of 30 to 49 years (Mathur and Sharma, 1970), then falls steadily. There is a higher male preponderance with the ratio of males to females 1.3:1.0. This is similar to the general attendance at the clinic, but is out of line with most previous surveys in which females show a higher incidence of trachoma than males (Kupka *et al.*, 1968). This series represents a selected group of hospital attenders and is biased because in Asian society males attend the clinics more readily than females or children. Over 70% of these cases were from the low-income stratum. On the other hand, recent improvements in sanitary conditions and treatment programmes have influenced the severity of trachoma among the middle and upper class younger generations. Elderly people with severe trachomatous

Table 1 *Age and sex distribution of patients with trachomatous corneal opacities*

Age group*	Total (%)	Male (%)	Female (%)
12 -	4.4	6.0	2.3
20 -	11.2	13.4	8.0
30 -	20.7	16.1	24.0
40 -	24.3	20.2	30.8
50 -	18.5	19.7	18.2
60 -	16.5	18.0	15.0
70+	4.4	6.6	1.7

*Owing to the absence of civil registration most people did not know their age. It was estimated by the examining ophthalmologist from the person's general appearance

Table 2 *Trachomatous corneal opacities classified by density*

Type of corneal lesion	Total no.	Males	Females	%
Nebula	592	432	160	16.2
Macula	1516	936	580	41.4
Leucoma	1416	928	488	38.7
Staphyloma	102	69	36	2.8
Descemetocoele	32	12	20	0.9

Table 3 *Comparison of corneal opacities in different countries*

Type of corneal lesion	Egypt	India	Qatar
Nebula	63.2%	1.6%	16.2%
Macula	—	25.4%	41.4%
Leucoma	32.0%	73.0%	38.7%
Staphyloma	5.7%	—	2.8%

corneal lesions were found in all strata of society—victims of folk medicine, and lesions which had been neglected in less prosperous days.

DENSITY OF THE CORNEAL LESION

In common with all other corneal opacities, simple division of the trachomatous corneal type into nebula, macula, and leucoma does not necessarily give an indication of the degree of visual disability. Table 2 shows the different trachomatous corneal opacities according to their density.

Table 3 compares the different corneal opacities between Egypt, India, and Qatar (all developing countries). Leucoma and staphyloma imply an extensive degree of corneal involvement. Egypt and Qatar show the same incidence, while in India it is nearly double.

SITE OF THE CORNEAL LESION

In this series corneal opacities have been classified according to their site rather than their density, a classification which is better related to visual prognosis and helps in selection for graft surgery. They are divided into three groups:

Peripheral corneal opacities

These form about 25% of the cases. The patients usually have a reasonable visual acuity (average 0.3, i.e., 6/18 to 20/60). Photokeratography in these cases showed a clear regular optical zone, and the

corneal peripheral area was irregular. In this group patients with poor vision suffer from irregular astigmatism, especially if ectasia has occurred. Contact lenses cannot be used routinely because of associated xerosis.

Central corneal opacities

These are seen in approximately 40% of the cases (commonest). They are usually associated with poor vision (average visual acuity is 0.08, i.e., 5/60). The spread of visual acuity was from 6/18 to light perception.

Diffuse corneal opacities (ground glass cornea)

These were fairly common in elderly people, females more commonly than males (Mathur and Sharma, 1970; World Health Organisation, 1962; Awasthi *et al.*, 1974; Hussein, 1974; Siniscal, 1949; Kupka *et al.*, 1968), and very rare in those under 20 years of age; the average age was 44 years. They form 35% of trachomatous corneal opacities. All corneae were vascularised, and fine vessels reached the centre of the cornea. The cornea showed variable thickness and in some areas was reduced by 50%. The lesion was commonly bilateral. The average visual acuity in these cases was 0.05, i.e., 3/60. The best visual acuity was 6/24. Degenerative changes are common (Soliman, 1971). Occasionally, in elderly people with atheromatous plaques, desquamation of the central area leaves a clear optical zone with improvement in vision.

In some of these cases, whether peripheral, central, or diffuse, the visual acuity may drop beyond the level of economic blindness, i.e., 6/60 (25.6% in this series). In most of these there are other associated anterior or posterior segment lesions which contribute to the disability. Those which directly relate to the primary aetiological factor are: (1) Myopic changes. Most patients with central corneal trachoma become myopic. Cambiaggi suggested this was due to trachomatous weakness of the cornea-scleral envelope (Cambiaggi, 1958). (2) Amblyopia ex anopsia in monocular corneal opacities, or in the eye with the denser corneal lesion (Stevens, 1971). (3) Secondary glaucoma in non-adherent and adherent leucomata.

The high incidence of glaucoma in trachomatous subjects is explained by increased resistance to outflow, either precanalicular (Larmandé and Coulliaud-Maisonnette, 1955) or postcanalicular (Nema *et al.*, 1964; Carenini and Cambiaggi, 1957; Beiram, 1970), from perilimbal trachomatous scarring. In adherent leucoma there may be resistance to outflow in the trabecular area. The incidence of glaucoma in trachomatous cases with corneal lesions was 6.5% in this series.

Comment

Corneal opacities form one of the basic factors producing poor vision in trachomatous subjects (Parthasarathy, 1965). Many reports on corneal trachoma and resultant visual disability have been published, but direct comparison is often impossible owing to different clinical classifications (Bietti, 1950; Assaad and Maxwell-Lyons, 1967). Classification according to the site of the lesion rather than its density seems to be justified, because the position of the opacity is related to the actual visual disability produced.

At the onset of the first attack of trachoma it is impossible to give a visual prognosis. Mild cases, treated properly and early, subside in a few days without visual disability. Once ulceration occurs and secondary bacterial infection sets in the clinical picture may provide prognostic clues (Mathur *et al.*, 1967; Dawson *et al.*, 1974; Jones, 1975).

A central lesion has the poorest visual prognosis, especially in children, who are likely to develop squint and amblyopia. Low socioeconomic status aggravates the prognosis of a corneal lesion because corneal resistance is poor in the presence of malnutrition and predisposes to the development of deeper corneal lesions and the risk of perforation (Bobb, 1974). Secondary bacterial infection also tends to recur more often in the presence of poor hygienic conditions (Foster, 1965; Howells *et al.*, 1969).

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