WORLD HEALTH ORGANIZATION

REGIONAL OFFICES FOR THE EASTERN MEDITERRANEAN AND FOR EUROPE

ORGANISATION MONDIALE DE LA SANTÉ

BUREAUX RÉGIONAUX DE LA MÉDITERRANÉE ORIENTALE ET DE L'EUROPE

TRACHOMA CONFERENCE

Tunis, Tunisia
15 - 24 October 1959

EM/Trach.Conf./13
30 September 1959

ORIGINAL : FRENCH

THE CARDINAL SIGNS AND DIFFERENTIAL DIAGNOSIS OF TRACHOMA, ACUTE AND CHRONIC CONJUNCTIVITIS

by

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The Programme Committee requested my colleagues and myself to prepare a paper on the symptoms of trachoma and on its differential diagnosis from acute, chronic and follicular conjunctivitis.

I have first to inform my colleagues that we have been carrying out research work and studies on trachoma for thirty years, and that hitherto we have been able to collect useful and interesting data on this disease.

For the preparation of this paper, owing to the lack of time, we went through the records of our thirty years of research; taking into account the data thus collected, and with the cooperation of Drs. Mohsenin, Darougar and Pirouz, I prepared a new programme of study on the symptoms of trachoma in Iran and on its differential diagnosis. I shall briefly give an account of the result of this study, for which I had additional help from other colleagues, professors ("agrégés"), heads of clinics, the chief of the Farabi Hospital laboratory as well as the technical directress of that hospital, who was in charge of the preparation of the colour photos. I wish to extend to them my deep gratitude for their assistance.

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If, at the beginning of this report, I mentioned that we prepared a programme for the study of the symptoms of trachoma in Iran and for the study of its differential diagnosis, it is because those attending this Conference are all distinguished trachomatologists from various countries, are all well acquainted with the symptoms of trachoma and aware of the works written by celebrated trachomatologists. I shall therefore abstain from speaking of the general symptoms of trachoma. The object of convening this Conference by the World Health Organization is the exchange of new knowledge in respect of trachoma in the participating countries, with a view to planning an adequate programme for the control of this disease. I take the opportunity to set forth in detail some of the results of our studies so that my colleagues may further familiarize themselves with the characteristics of trachoma in Iran.

The state of trachoma and its spread in Iran, during the last ten years, differs from what it was in the past. As a result of the improvement of the cultural, health and economic levels of the population, as well as of the development of organizations for treatment, both in cities and small urban communities, this disease has considerably lost ground. To-day, in Teheran, active trachoma cases are rather rare, whilst in remote villages and desert areas trachoma still prevails, as in the past, with no appreciable change.

The present status of the spread of trachoma in towns, and the positive and interesting influence exercised by health, cultural and economic advances on the decrease of its spread, confirm our belief that Iranian trachoma is mild. Our previous studies and our recent research showed that in Iran, especially in towns, pure trachoma does not cause any important subjective symptoms. Many patients affected by trachoma and feeling no ailment are found to be suffering from the disease when examined by a doctor. However, on occasion the following symptoms have been noted :

SUBJECTIVE SYMPTOMS

A. In primitive and active trachoma :

1. The eye gets quickly tired, especially when looking at close objects.
2. The eyelids open with difficulty on waking (without any secretion).
3. Photophobia.
4. Feeling of heaviness of eyelids.
5. Abnormal twitching.
6. Watering of the eye.
7. Feeling of foreign body.

B. In advanced cases of trachoma with scarring :

1. Watering of the eye.
2. The eye gets tired when studying or working.
3. Heaviness of eyelids.
4. Excessive photophobia.
5. Feeling of foreign body.

C. In trachoma accompanied by complications : In such cases subjective symptoms are numerous and we shall abstain from dwelling on this subject.

D. In trachoma accompanied by other conjunctivitis;

In Iran trachoma is sometimes accompanied by allergic, vernal and purulent conjunctivitis. Although such additional or secondary conjunctivitis aggravate the trachoma symptoms - which would result in subjective symptoms in the patient - subjective symptoms of conjunctivitis cover the subjective symptoms of trachoma. That is why when patients consult the doctor for symptoms of conjunctivitis trachoma is detected.

OBJECTIVE SYMPTOMS

A. In primitive symptoms :

Trachoma in Iran being often and almost always mild, patients do not show any particular symptom at the beginning. That is why we have not met patients suffering from early trachoma. However, on examining our records we found out that in some instances a few persons having felt some ailment came to the clinic. The eye examination showed a light redness of the palpebral and bulbar conjunctiva, as well as a light infiltration of the conjunctiva, and the case was diagnosed as simple conjunctivitis. Some time later, the trachoma symptoms appeared in these patients. Clinical examinations with the biomicroscope, as well as the microscopical examination of scrapings, confirmed the diagnosis of trachoma.

Moreover, experimental inoculations carried out in our service provoked, on the fifth day following the inoculation, a slight redness in the palpebral conjunctiva. The redness progressively increased, and later the infiltration of the conjunctiva caused oedema of it.

There are two common symptoms at the onset of trachoma :

1. Redness of the palpebral conjunctiva.
2. Infiltration and thickening of conjunctiva.

When trachoma becomes manifest, the following symptoms are present :

1. Thickening of the palpebral conjunctiva, in a way that often the blood-vessels are visible under a thick and opaque membrane, and the ducts of secretion glands of the lid seem to have disappeared.
2. The natural pink colour of the conjunctiva disappears and is replaced by a leaden and dull colour.

A small number of white spheric nodules appear in certain parts of the tarsal conjunctiva - assuming the aspect of white caviar or birdseed. These nodules may be found sometimes on the surface of the conjunctiva and sometimes are projecting. As the disease gains ground, the number of nodules and their protrusion increases so that, at the onset of advanced trachoma, some of these nodules burst when the eyelid is everted and an orange-coloured liquid flows out. (These nodules are the first stages of trachoma follicles).

These nodules are generally invaded by the blood vessels in the centre of which they are situated and one has the impression that the vessels penetrate into the thickness of the follicle.

3. The network of the conjunctival vessels increases, and one may note through the biomicroscope a great number of new capillary blood-vessels.

4. Apart from the above nodules, others may be seen protruding, red-flesh-coloured, with an irregular and projecting rim on which are grouped vessels in heaps, called "papillae".

5. In the limbus, and the upper part of the cornea, thin vessels grow vertically downwards and may be seen between 10 and 2 o'clock. Likewise, in the cornea the cellular infiltration is noticed in front of the vessels.

In advanced trachoma the following symptoms are observed :

1. The palpebral conjunctiva becomes completely thick and dirty, so that the perpendicular vessels situated behind the conjunctiva cannot be seen.

2. A particular ptosis of the upper eyelid may be noticed.

3. Throughout the greater part of the conjunctiva of the upper eyelid are white, hemispheric and protruding follicles at various stages of growth. When the eyelid is turned with the lid evertor mature follicles burst and an orange-coloured liquid flows out.

4. With these nodules, one may see flesh-coloured papillae of various forms, including polygonal ones. In most cases their number increases so that the follicles are grouped in islets.

5. Sometimes one can observe follicles and papillae in the bulbar conjunctiva, chiefly in the region of the caruncula.

6. In certain patients follicles and papillae are noticed on the conjunctiva of the lower eyelid.

7. The vessels of the bulbar conjunctiva increase in number and volume.

8. At times ocelles are seen on the cornea mainly at the limbus. On an average, their number is from three to four, but sometimes they are more numerous, although this is rare.

9. On the cornea there is the panmus of trachoma, consisting of infiltrations and vessels. Sometimes the infiltration and the follicles of the cornea are so numerous that they produce a pseudo-tumour of the cornea.

Trachoma at the healing stage :

1. The eyelid is thick and shows a ptosis.
2. The eye-lashes sometimes change their position and form, and some of them bend inward towards the eye.
3. On the palpebral conjunctiva, scarring lines of varied forms may be observed: they are either star-shaped or like thin whitish streaks, parallel to and a few millimetres from the free rim of the eyelid, or irregularly disposed. The conjunctiva itself becomes white and loses more or less its flexibility.
4. In advanced cases, the conjunctiva and the inner surface of the tarsus are shorter than normal, and this results in the eyelid bending towards the interior and it then becomes difficult to turn it without the help of an eyelid evertor. Sometimes, as a result of the pressure exercised by this operation, the eyelid tears and haemorrhage appears.
5. On the conjunctiva are seen a small number of follicles, and a greater number of papillae.
6. In such a case, the pannus of the cornea attains its most conspicuous stage of development, which is sometimes so great that a great part of the cornea is invaded by infiltration and vessels, lowering considerably the patient's sight.
7. The limbus follicles change their form and in their stead are seen particular fossae, ordinarily called Herbert's pits or Bonnet's ocelles.
8. At the end of this stage, the pannus diminishes, the vessels contain less blood and the infiltration diminishes too.

Trachoma during the healing period :

1. Thickening of the eyelids.
2. The eyelid's rim tends to bend towards the interior.
3. Eyelid ptosis.
4. Opacity of the cornea and irregularity of its upper part.
5. Presence of numerous scars on the conjunctiva in the form of whitish irregular strands, star-shaped or disposed in lines parallel to the free rim of the eyelid. The conjunctiva itself is covered by a whitish non-protruding scar.
6. Excessive stricture of the conjunctiva due to scarring.
7. Deviation of tarsus and its bending which causes the upper eyelid to change its shape.
8. On the cornea a marked pannus of varied forms consisting of vessels and cellular infiltrations is seen.

9. In the cases where infection dies out, one may see on the cornea diffuse and empty vessels.

10. Presence of Herbert's pits or Bonnet's ocelles.

The above-mentioned symptoms represent the common trachoma, but the Iranian trachoma does not always show such symptoms. For example, in the southern region of the country, where the spread of trachoma is more marked, the predisposing conditions and the transmission agents are more abundant, numerous cases of active trachoma are found, exhibiting numerous follicles, papillae and pannus. In these regions, the prognosis of the disease is more serious, whilst in the central regions such as Teheran, Saweh and surroundings, trachoma is milder or of medium severity, as far as symptoms are concerned. In the northern regions, not only are trachoma cases few, but they are also mild. Very few follicles and papillae are seen in patients, with a slight pannus formed of thin vessels and small infiltrations in the upper part of the cornea.

CLINICAL FORMS OF TRACHOMA

With regard to the number of subjective and objective symptoms, Iranian trachoma is divided into three groups :

1. Serious :

In this type of disease numerous follicles and/or papillae are seen, on the conjunctiva of the upper and lower eyelid, even on the caruncula or the fornix, and on the upper part of the cornea. Sometimes, even nodules develop beyond measure and get out of their normal shape. In this kind of trachoma, the pannus is very marked and the patient may even lose his sight.

This type is met more in the southern regions of Iran, more particularly on the Persian Gulf coast, and to a lesser degree in the central plateau. The prognosis is severe and often leads to trachoma complications and finally to blindness.

2. Medium severity :

In this type, which is met in the regions of the central plateau, and to a lesser extent in the northern and southern regions of the country, the conjunctival nodules are noticed in average numbers. The trachoma pannus and ocelles are fairly abundant in the affected individuals, but the severity of the first type is not observed here.

3. Mild form :

One may say that the majority of Iranian trachoma cases belong to the mild form, this form is precisely that which lacks subjective symptoms and that is why the patient does not even suspect his own condition. In these patients follicles and papillae in small numbers are seen and in some cases follicles do not exceed one or two in number and they are present only on the conjunctiva of the upper eyelid. The pannus is formed by a small infiltration and a small number of thin vessels which are v i s i b le only through the biomicroscope. This form of the disease has a mild evolution and the recovery is spontaneous in a fairly large number of cases.

B. As regards the presence or absence of the essential findings of trachoma, that is to say the follicles, papillae and pannus, the following clinical forms are met in Iran :

1. Papillary trachoma :

In this form, the palpebral conjunctiva thickens and changes its colour. On the conjunctiva are found large numbers of small and large papillae. These papillae cover almost all the conjunctival surface, and if they are thin, its surface will have a velvety appearance. The protrusions are hard and cannot be scraped properly. They do not burst when pressed and they are fleshy. In individuals affected, the pannus is quite clear and one may say that it is because of the pannus that one succeeds in diagnosing this form of trachoma from other forms of infectious conjunctivitis.

2. Infiltrated trachoma, without follicles :

In this form, which is incidentally very rare in Iran, the conjunctiva becomes thick without any protrusion. The diagnosis is made only from the pannus, which is relatively clear-cut.

3. Unilateral trachoma (one side trachoma) :

I consider that the unilateral trachoma, even if it exists, is temporary, and that after some time both eyes are affected.

4. Trachoma without pannus :

In the course of our various studies we rarely met in adults trachoma without pannus. The clinical biomicroscopical examination, together with the microscopical examination, confirmed the presence of active trachoma in the palpebral conjunctiva, but there was no pannus on the cornea.

Another kind of disease is trachoma accompanied by various conjunctivitis, called "mixed". But we notice that the subjective and objective symptoms of trachoma, in relation to secondary conjunctivitis, show some differences. That is why it should be subdivided as follows :

1. Trachoma accompanied by vernal conjunctivitis :

The patient feels itching and lachrymation. In the palpebral conjunctiva, papillae of vernal conjunctivitis are first met, and sometimes these are so numerous that they cover the trachoma follicles which at first sight renders the trachoma diagnosis difficult. In such cases, further investigations are needed to find in the nooks and corners of the conjunctiva the trachoma follicles. But the most important and most interesting is the trachoma pannus, which confirms the presence of the disease, added to vernal conjunctivitis.

2. Trachoma combined with allergic conjunctivitis :

The patient feels itching and suffers from lachrymation. He complains of a light whitish secretion which collects in the corner of the eye. In these patients the conjunctiva assumes a red pearly colour and the trachoma nodules are seen, as well as the pannus on the cornea. The microscopical examination shows the presence of an allergic conjunctivitis accompanied by trachoma.

3. Trachoma combined with purulent conjunctivitis :

In patients showing this form, the trachoma nodules are large and the marked congestion of the conjunctiva more conspicuous; pannus vessels and the infiltration are more marked than in pure trachoma. In this form of mixed trachoma, the symptoms of pain, lachrymation, photophobia, redness of the ocular conjunctiva, a sharp congestion of the palpebral conjunctiva and a great secretion are noticed. Often these cases of mixed trachoma are considered as acute trachoma, and for this reason we deny the existence of acute trachoma in Iran.

DIAGNOSIS OF TRACHOMA COMPARED WITH ACUTE AND CHRONIC CONJUNCTIVITIS

After the explanations I have had the honour to give to this learned company, you have realized that trachoma in Iran shows the important characteristics indicated hereafter :

1. At the onset the disease is latent.
2. Its evolution and development are slow.
3. There are no symptoms of pure trachoma and in certain cases there exists a slight photophobia, lachrymation, feeling of an extraneous body and heaviness of eyelids.
4. The signs of palpebral involvement are follicles and scars.
5. On the cornea, the pannus, ocelles and sometimes epithelial keratitis are noted.
6. The prognosis of the disease is not encouraging as it leads to failing sight and sometimes to its loss following complications.
7. These complications are, by order of importance, as follows : Entropion, trichiasis, keratitis, symblepharon, xerosis and calcareous degeneration.
8. Sulphonamides and antibiotics are not very effective.

It thus appears that trachoma in Iran has no definite clinical picture and that, owing to the particular features of some of its symptoms, it cannot be mistaken for any other disease.

Experience has proved that the diagnosis of certain forms of this disease becomes very difficult owing to change in the nature of the symptoms of the conjunctiva and the cornea. That is why the biomicroscope should be used for the final diagnosis.

With the aid of such an appliance, and observing the particular shape of the trachoma follicles, the thin scars and the pannus, one may definitely diagnose trachoma. We may therefore assert that the latter disease can never be mistaken for another one. But, if a biomicroscope is not available - as in the case of studies carried out in villages for trachoma control as well as for mass campaigns - the diagnosis of trachoma and its differential diagnosis becomes difficult. In such cases, trachoma must be differentiated from the following diseases :

I Acute conjunctivitis

Acute conjunctivitis caused by various microbes cannot be mistaken for trachoma owing to its subjective symptoms. But, if the disease is not treated or if treatment is unsatisfactory, the disease may become chronic and in such cases it may be mistaken for trachoma.

The symptoms of these forms of conjunctivitis are the following :

1. The subjective symptoms are mild and consist of lachrymation, photophobia, secretion, slight pain.
2. The objective symptoms are :
   (a) Congestion of the palpebral and bulbar conjunctiva,
   (b) Presence of large and small papillae which may cover all the upper and lower palpebral conjunctiva. In persons afflicted with this disease no symptoms appear on the cornea (pannus).

It is the presence of papillae which, at first sight, causes this disease to be mistaken for trachoma and in order to diagnose such cases one must use an electric ophtalmoscope provided with a lens of + 10 dioptries, a binocular lens or a hand biomicroscope. With such means one can easily distinguish the fleshy, thick and reddish papillae of the conjunctiva from the half protruding whitish nodules and follicles of trachoma. Furthermore, the absence of symptoms in the cornea separates it from trachoma.

II Mild and chronic conjunctivitis

Mild and chronic conjunctivitis show symptoms similar to those mentioned above. They may easily be diagnosed by distinguishing the papillae from the trachoma follicles by means of the hand biomicroscope, the ophtalmoscope and the binocular lens, and by the absence of signs on the cornea.

III Inclusion conjunctivitis (swimming-pool conjunctivitis)

The inclusion conjunctivitis is unusual in Iran and, when present, it prevails ordinarily in an epidemic form.

The characteristics of the disease, according to our observations are as follows :

1. At the beginning, the disease is acute.

2. The secretion is fairly abundant.

3. Presence of papillae and follicles These are transparent and sometimes whitish, and while around them one does not see vessels, there are vessels on the nodules.

4. The pseudo-follicles are found rather on the lower palpebral conjunctiva.

5. The cornea does not show any morbid changes.

6. In serious forms the preauricular glands swell and get enlarged.

7. The disease may sometimes become long and chronic.

8. Sulphonamides and antibiotics are efficacious.

As one may see, this disease shows the following differences from trachoma and for this reason they may be differentiated one from the other :

1. The follicles of trachoma are often situated between the vessels as they penetrate in their thickness, whilst the follicles of the inclusion conjunctivitis do not show such vessels and are only disseminated on the surface (they look rather like papillae).

2. In most cases, the trachoma follicles are situated in the upper palpebral conjunctiva. Even if follicles are found in the lower palpebral conjunctiva, there are always follicles on the upper lid as well, whilst in swimming-pool conjunctivitis, the follicles are often in the lower palpebral conjunctiva alone.

3. No scar is noted in swimming-pool conjunctiva.

4. No pannus is noted

5. At microscopical examination the number of inclusions appears higher than that found in specimens from trachoma cases.

IV Acute follicular conjunctivitis (Boal Type)

The characteristics of the disease which occurs sporadically in Iran are the following :

1. It is found mostly in adults

2. At the onset it is often unilateral, but sometimes also bilateral.

3. The secretion is relatively not very abundant.

4. Follicles form themselves rapidly. Their margin is irregular and they carry vessels (as in the case of papillae).

5. The pre-auricular lymphatic glands always swell and become enlarged.

6. The follicles are found more often in the fornices but sometimes also in the lower palpebral conjunctiva.

7. No lesions on the cornea are present, but sometimes there appear ulcers.

8. The disease is mild and does not last more than two to four weeks.

It is recognizable from trachoma owing to the shape of the follicles, the absence of scars and pannus, as well as by its short duration and the presence of pre-auricular glands.

V Virus follicular conjunctivitis

In the course of our recent research work and studies, we have met some forms of follicular conjunctivitis showing the following characteristics :

1. At the start the disease is unilateral (one-sided), and after two or three days it affects the other eye.

2. Its onset is always in a sub-acute form.

3. The subjective symptoms are : a light pain, small secretion, lacrymation, photophobia, feeling of an extraneous body.

4. The signs of palpebral conjunctivitis were : a rather high number of pseudo follicles with an irregular and hard margin. These follicles were mostly found in the lower palpebral conjunctiva and in the fornices.

5. The corneal signs were often dendritic keratitis, with anesthesia of the cornea.

6. The pre-auricular glands were swollen and hard.

7. The prognosis of the disease in patients who are not affected with an ulcer at the cornea, was good following treatment with antibiotics, mostly achromycin Palpebral complications disappeared after three to four weeks. However, in patients affected with an ulcer at the cornea the prognosis was not favourable.

Cytologic examinations were carried out in these patients, the sample taken from the conjunctiva showed a monocytic infiltration but no inclusions similar to those of trachoma were noted. Aetiological research work could

not be carried out in respect of this disease. We never found either pannus or conjunctival scars in these patients.

VI Chronic follicular conjunctivitis

This disease is relatively widespread in Iran, and its characteristics may be defined as follows :

1. Follicles are seen in the lower palpebral conjunctiva, sometimes in the upper palpebral conjunctiva, and often in the fornices.
2. No subjective symptoms were felt, but the patients complained of eye weariness and feeling of an extraneous body
3. No scar or pannus was noted in this disease and that is why it could be recognized from trachoma.

VII Conjunctival folliculosis

This disease occurs more frequently in children suffering from tonsilitis or adenoids. Owing to the symptoms from the above and to the sensation felt by the patient in his eyes, he usually goes to a doctor for advice and after the medical examination, the doctor diagnoses this form of folliculosis. The disease has no particular symptoms. The affected child has only the feeling of weariness in his eyes, and the impression of having in them some extraneous body. Photophobia and twitchings are also met. Through the biomicroscope follicles similar to small air bubbles without vessels are noted. On the conjunctiva special nodules are noticed, mainly in the fornices and on the lower palpebral conjunctiva. We never met pannus

VIII Allergic conjunctivitis

Recently this disease considerably spread in Iran. As sometimes it was mistaken for trachoma, we mention hereafter its characteristics :

a) Subjective symptoms, including a rather marked itching, lacrymation, feeling of an extraneous body in the eye and photophobia.
b) Objective symptoms :
   1. The bulbar conjunctiva becomes brick red
   2. The palpebral conjunctiva assumes a pearly colour
   3. The conjunctiva shows irregular nodules resembling papillae
   4. The palpebral conjunctiva thickens and its vessels are no longer visible.
   5. No injury is noted on the cornea.

As I have mentioned, this disease cannot be mistaken for trachoma. However, non experienced doctors, examining patients with the naked eye could be mistaken in their diagnosis. but with a little attention and taking into account the fact that in this disease there are no trachoma follicles, no pannus and no scars, the diagnosis becomes very easy.

IX. Vernal Conjunctivitis

This disease is never taken for trachoma as the patient shows neither trachoma follicles nor pannus nor scars. Besides, the subjective symptoms of vernal conjunctivitis differ from those of trachoma (acute itching, particularly when there is secretion). The disease is periodic, whilst trachoma shows at all times its specific symptoms

Vernal conjunctivitis is found in three forms :

1. Palpebral, with rather big vegetations.
2. Bulbar form, showing a large ring around the cornea.
3. Mixed form, with palpebral vegetations and a ring around the cornea, both symptoms hardly developed.