

The significance of facial patches and Type I reaction for the development of facial nerve damage in leprosy. A retrospective study among 1226 paucibacillary leprosy patients

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Summary Charts of 1226 paucibacillary leprosy patients, registered between 1982 and 1987 were reviewed for recent facial nerve damage, facial patches and the presence of Type I reaction. Twenty-six (2.1%) patients with recent lagophthalmos were identified. In a great majority (85%) patients with recent lagophthalmos showed significant patches over the malar region or around the eye, at the same side as the nerve damage together with clinical signs of Type I reaction.

This combination of significant patches in certain locations and Type I reaction seems to be a pre-condition for facial nerve damage.

The clinical implication is that a small group of patients may be identified, who are at risk of facial nerve damage. By examining these patients more carefully it will be possible to detect nerve damage early and to prevent permanent damage of the facial nerve by timely treatment with an appropriate steroid regimen.

Introduction

Involvement of the facial nerve and especially of the zygomatic branch, is well known in leprosy, leading to weakness of the orbicularis muscle and subsequent lagophthalmos. Lagophthalmos is a severe ocular complication in leprosy and a potentially blinding condition. Exposure of the cornea, microtraumata and secondary infection may lead to progressive opacification of the cornea. Apart from that, lagophthalmos is a cosmetic blemish and in all degrees of lagophthalmos patients will complain about bothersome watering of the eye.

It is well known that the appearance of Type I reaction puts a patient at risk of nerve damage and secondary deformities. Early recognition and adequate medical treatment of

early nerve damage with steroids may result in full restoration of nerve function. This has been well described, e.g. the ulnar and median nerves.^{1,2} However, relatively little work has been done on the early detection and treatment of facial nerve damage³ as most work dealt with advanced cases.⁴

Lagophthalmos is the result of facial nerve damage, following type I reaction. From clinical experience it is well known that facial patches in reaction often precede lagophthalmos. In this article we analyse the data of 1226 paucibacillary patients with regards to the significance of patches in the face, Type I reaction and the development of lagophthalmos.

Patients and methods

The patients in this study attended the outpatient clinic of Dhoolpet Leprosy Research Centre (DLRC). The majority of the patients were self-selected, a few were referred by private doctors. There is not a defined catchment area. We analysed retrospectively the charts of all paucibacillary (PB) patients registered between 1982 and 1987 for treatment, on general data as sex, age, classification (according to Ridley–Jopling 5 point scale), duration of disease before registration, previous anti leprosy treatment, if any, and period of follow-up. Slit-skin smears for acid-fast bacilli had been taken in all patients. Secondly we analysed the presence of Type I reaction, signs of facial nerve damage resulting in lagophthalmos, and the presence of patches in the face, as recorded on the body chart.

Type I reaction was clinically diagnosed and defined as a sudden appearance of red and raised lesions with or without nerve damage. In most patients histology had been done for confirmation.

Lagophthalmos was defined as damage to the facial nerve, leading to incomplete closure of the palpebral aperture, with a minimal gap of 1 mm on mild closure. For the purpose of this study we were especially interested in lagophthalmos of recent origin, which we defined as a history of lagophthalmos of less than one year's duration.

Facial patches were divided into two groups: 'significant' patches, and 'other' patches. A 'significant' patch in the face was defined as a patch of more than three centimeters in diameter, covering the malar region or located around the eye. Certain common sites were patches around the eye, large midfacial patches covering both eyes, or patches covering the whole half of the face including the angle of the mouth (Figure 1).

'Significant' patches included both pale flat macula's (pfm's) and red and raised patches in reaction. 'Other' patches were either smaller or located elsewhere. We analysed the relationship between lagophthalmos, facial patches and Type I reaction.

Results

The study covered 1226 PB leprosy patients. Patients were generally young adults with recent onset of disease (median age 28 years, median duration of disease 12 months). The patients had been classified as 24% tuberculoid (T) and 76% as borderline–tuberculoid (BT).

Type I reaction was present at registration or appeared during treatment at the Centre in 298 (24%) of the patients. The facial patches were classified as 'significant' in 89 (7%) of

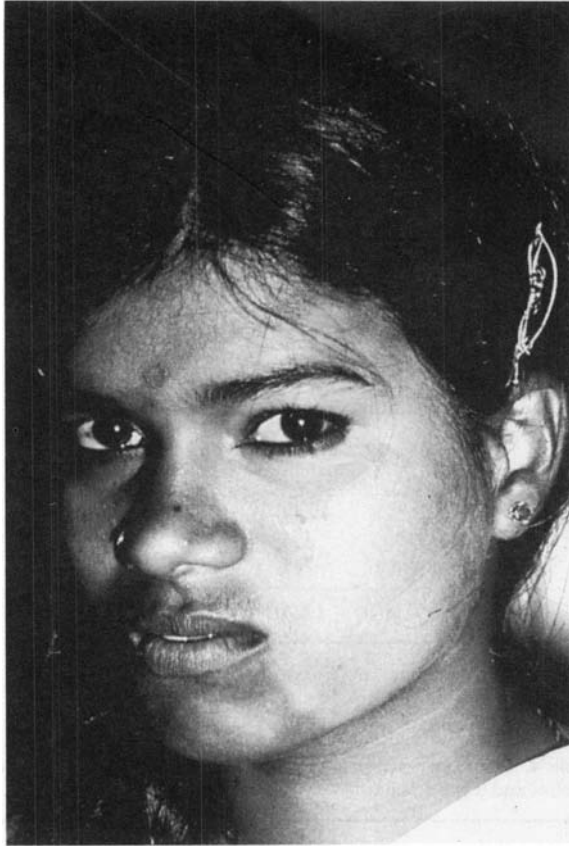


Figure 1. Patient with BT leprosy and 'significant' patch (pfm), covering the left half of the face; no lagophthalmos.

the patients. Nearly all 'significant' patches occurred in the BT group 354 (29%) patients showed some 'other' patch in the face and 783 (64%) patients had no facial patches, according to the body charts (Table 1).

Table 1. Prevalence of facial patches in PB leprosy

	No. of patches	%
'Significant' patch*	89	7
Other patch	354	29
No/unknown patch	783	64
Total	1226	100

*Pale flat lesion (pfm), or red and raised (in Type I reaction) patch, located around the eye or in the malar region, at least 3 cm in diameter.

Table 2. Relationship between recent lagophthalmos and Type I reaction

	No. of patches	No. of lagophthalmos	%
With Type I reaction	298	24	8.0
Without Type I reaction	928	2	0.2
Total	1226	26	2.1

Table 3. Relationship between recent lagophthalmos and facial patches

	No. of patches	No. of lagophthalmos	%
Sign.* patch	89	23	26
Other patch	354	1	0.3
No/unknown patch	783	2	0.3
Total	1226	26	2.1

*Sign. = 'significant', see Table 1.

Table 4. Relation between recent lagophthalmos, significant facial patches and Type I reaction

	No. of patches	No. of lagophthalmos	%
Sign.* patch With Type I reaction	49	22	45
Sign. patch Without Type I reaction (pfm)	40	1	2.5
Total	89	23	26

*Sign. = 'significant', see Table 1.

In the total group of patients we identified 26 (1 TT, 25 BT) patients with recent lagophthalmos, a prevalence of 2.1%. Lagophthalmos was present at the time of registration in 22 patients and developed in 4 additional patients while they were under treatment at the Centre.

Lagophthalmos of recent origin was present in 24 (8%) of the 298 patients with Type I reaction. In the 928 patients without signs of Type I reaction only 2 (0.2%) had lagophthalmos (Table 2).

Lagophthalmos of recent origin was present in 23 (26%) of the 89 patients with a 'significant' facial patch. In contrast only 3 (0.3%) of the 354 patients with 'other patches'



Figure 2. Patient with BT leprosy, red and raised 'significant' patch over the left half of the face and lagophthalmos of recent origin (some cotton wool, where skin smear has been taken).

and 783 patients without patches had lagophthalmos (Table 3). Finally, lagophthalmos was present in 22 (45%) of 49 patients who had both 'significant' patches, and Type I reaction (red and raised patches) (Table 4). In 40 patients with a 'significant' patch, but without reaction (pfm) only one patient had lagophthalmos. The lagophthalmos was, without exception, at the same side as the patch, and, in the case of large patches covering the whole face, often bilateral. In large patches the angle of the mouth could get involved as well.

All together, the great majority, 22 patients (85%) of 26 patients with recent lagophthalmos, had a 'significant' red and raised patch in Type I reaction (Figure 2).

Discussion

Nerve damage in Type I reaction is a well-known complication in borderline leprosy. The ulnar and median nerves are most commonly affected and best studied. From our results it appears that Type I reaction in itself does not seem to put a patient at great risk of facial nerve damage, unless there is also a reactive facial patch in a certain location and of a certain size. Patches in relation with lagophthalmos are typically located around the eye and in the malar region and are usually more than 3 cm in diameter. This is in the territory supplied by the zygomatic branch of the facial nerve and also in the territory supplied by the maxillary branch of the trigeminal nerve. By concentrating on this particular group of patients, which constituted only about 7% of all PB patients, we can detect patients at risk early and treat them appropriately with steroids.

Forty five per cent of the patients with a 'significant' red and raised patch in reaction

developed lagophthalmos in this series. However, all patients with a 'significant' patch and Type I reaction had routinely been treated with systemic steroids, therefore lagophthalmos may well have been prevented in others. The results of treatment with steroids in patients with recent lagophthalmos will be dealt with in a second paper.

It is interesting to note that such a precondition, such as having a patch in Type I reaction in the course of nerves, is not required in the case of ulnar and median nerves as these have been seen to be damaged in polyneuritic cases in Type I reaction.

We agree with the hypothesis of Dastur *et al.*⁵ about the possible mechanism of involvement of facial nerve: unlike the ulnar and median nerves, which are mixed nerves, the facial nerve is a pure motor nerve. The involvement of a purely motor nerve, selective neuritis of its zygomatic branch and consequent lagophthalmos might be explained by the fact that several anastomoses exist between the facial (motor) and the trigeminal (sensory) nerve and particularly between the peripheral nerve ends of the zygomatic branch of the former and the maxillary branch of the latter, supplying the upper malar and lower eye-lid regions.⁶ It has been reported before that in most cases of facial nerve involvement in leprosy there is sensory impairment as well in the territory of the trigeminal nerve and especially over the maxillary branch. Patients with longstanding lagophthalmos often show hypopigmented anaesthetic patches in the territory of the maxillary nerve.^{7,8} It becomes conceivable that the leprosy infection, entering the malar skin through sensory fibres, progresses in such a way as to involve the peripheral motor branches of the facial nerve in the area. This offers a possible explanation for the necessity of a patch in the territory supplied by the maxillary nerve in combination with Type I reaction as a precondition for the occurrence of facial nerve damage. Other secondary factors operating upon the nerve branches in the zygomatic region may also be considered, such as the close apposition of these branches against the bony background of zygoma and the possibility of compression, colder temperature and exposure to trauma, due to the superficial subcutaneous location of nerve twigs, making the zygomatic branch particularly vulnerable. These and other factors have been evoked earlier to account for certain sites of predilection in involvement of nerves in the limbs.

In conclusion: facial nerve damage and lagophthalmos in PB leprosy seems to occur almost exclusively in the relatively small group of patients who have red and raised patches in the area around the eye or in the malar region. These patients should be examined carefully for early detection of lagophthalmos, so that they can be treated with systemic steroids as for Type I reaction with nerve involvement. We hope that this study will contribute to a better understanding of the mechanism of facial nerve damage and to early identification of patients at risk for the development of lagophthalmos.

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L'importance des plaques faciales et de la réaction du Type I dans le progrès de la détérioration du nerf facial dans la lèpre

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Sommaire Des tableaux sur 1226 patients de lèpre inscrits entre 1982 et 1987 ont été révisés pour la dégradation récente du nerf facial, et pour la présence des plaques faciales et de réaction du Type I. Vingt-six patients (le 2,1%) avec lagophtalmie récente ont été identifiés. Dans la plupart des cas (le 85%), des patients avec lagophtalmie récente avaient des plaques assez considérables sur la région malaire ou autour de l'œil, du même côté que le nerf dommagé, avec des indices cliniques de réaction du Type I.

Cette combinaison de plaques assez larges dans quelques zones avec réaction du Type I semble être condition préalable à la détérioration du nerf facial.

L'implication clinique de ces résultats c'est la possible identification d'un groupe limité de patients qui risquent de souffrir une détérioration du nerf facial. En suivant le progrès de ces patients de plus proche, il sera possible de détecter la détérioration du nerf en avance et d'éviter des dégâts permanents au nerf facial par l'entremise d'un traitement opportun avec un régime adéquat de stéroïdes.

La importancia de las placas faciales y de la reacción del Tipo I en el progreso del deterioro del nervio facial en la lepra

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Resumen Se revisaron los cuadros de 1226 pacientes de lepra, registrados entre 1982 y 1987, para deterioro reciente del nervio facial y la presencia de placas faciales y de reacción del Tipo I. Se identificaron 26 pacientes (el 2,1%) con lagofthalmía reciente. La mayoría de los pacientes con lagofthalmía reciente (el 85%) resultaron tener placas de tamaño considerable sobre la región malar o alrededor del ojo del mismo lado de la cara que el daño al nervio facial, e indicios clínicos de reacción del Tipo I.

Esta combinación de la presencia de placas de tamaño considerable en ciertas zonas y de reacción del Tipo I parece ser condición previa al deterioro del nervio facial.

La importancia clínica de estas observaciones es que se pueda llegar a identificar un grupo limitado de pacientes que estén a riesgo de sufrir un deterioro del nervio facial. Si se examina más de cerca a estos pacientes será posible el detectar a tiempo el deterioro del nervio y evitar que sea permanente mediante un tratamiento oportuno de un régimen adecuado de esteroides.