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Hypopigmented Face Patches; Their Distribution and Relevance to Ocular Complications in Leprosy[1]

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The most common lesion in leprosy is an area of numbness on the skin or a visible skin patch. Hypopigmented lesions that occur in leprosy may be found on any part of the skin. They may manifest as huge, well-defined patches or as vague, small, ill-defined ones. They may be single or multiple. Some patches may have hypoesthesia while others retain sensation. Some patches may turn erythematous while others can become infiltrated, depending upon the spectrum of the disease with which the patient manifests. These patches have been investigated extensively, both clinically as well as histopathologically. Hypopigmented patches occurring over the face have been investigated ([2, 5]) especially with reference to the occurrence of facial nerve damage. We studied the distribution of hypopigmented face patches and areas of anesthesia over the face and their relationship to ocular complications in leprosy patients and report our findings in this paper.

MATERIALS AND METHODS

Consecutive leprosy patients presenting at the outpatient department of the Schieffelin Leprosy Research and Training Center in Karigiri, India, from January 1994 to December 1994 with clearly visible hypopigmented facial patches were enrolled in the study. An equal number of age-, sex-, and classification-matched leprosy patients with similar socioeconomic backgrounds who did not have any hypopigmented face patches were enrolled as controls. Patients who had a history of having had an erythematous or a hypopigmented facial patch earlier were not included among the controls. Patients presenting with either type 1 or type 2 reactions, tinea versicolor, vitiligo or seborrheic dermatitis were not included among the cases or controls. All patients had their leprosy classification substantiated by histopathology. After due consent was obtained, the demographic and leprosy details for each patient were recorded on a pro forma sheet. Sensory assessment of the face was done using a Semmes-Weinstein monofilament which exerted a force of 0.05 grams, employing a recently described technique ([4]). Finally, the patients had an ophthalmic examination which included corneal sensory testing. The corneal sensory testing was done by gently placing a thin cotton wisp on the cornea, about 2 mm inside the limbus at the 6 o'clock position as the patient gazed upward, and noting the reaction of the patient. All data were entered into a computer and analysis was done using the SPSS program. The Mantel-Haenszel chi-squared test and weighted odds ratio (OR) were calculated.

RESULTS

Eighty-two leprosy patients with hypopigmented face patches and an equal number of age-, sex- and classification-matched leprosy patients without any hypopigmented facial patches as controls were enrolled in the study; 53 were males and 29 females. Their ages ranged from 6 years to 70 years with a mean of 35 years (S.D. 15.6). Forty patients belonged to the borderline tuberculoid (BT) group, 35 to

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TABLE 1. *Distribution of hypopigmented facial patches and anesthesia over the face in cases and controls.*

Nerve area	No. cases with hypopigmented patches	Cases with facial anesthesa	Controls facial anesthesia
Ophthalmic	62	5	7
Maxillary	57	9	4
Mandibular	54	4	3
Greater auricular	34	2	6

TABLE 3. *Anesthesia over the face and impaired corneal sensation in cases and controls.*[a]

Impaired corneal sensation	Facial anesthesia present		Facial anesthesia absent	
	Cases	Controls	Cases	Controls
Yes	9	3	35	18
No	7	10	31	51
Total	16	13	66	69

[a] Mantel-Haenszel weighted odds ratio = 3.36; p <0.001.

the borderline lepromatous (BL) and 7 to the lepromatous leprosy (LL) group. The mean duration of leprosy among cases was 7.1 years, and there was no significant difference in the duration of disease between cases and controls. Among the cases, 27 had completed their courses of fixed-duration multidrug therapy (MDT) and 55 were under treatment. Among the controls, 11 had completed fixed-duration MDT and 71 were under treatment; 31 cases and 25 controls were skin-smear positive for acid-fast bacilli (AFB) at least once during the course of the disease.

The hypopigmented patches were not confined to the sensory areas supplied by any one of the three major branches of the trigeminal nerve, but overlapped. Their distribution, along with the areas of anesthesia present over the face, is given in Table 1. The association of impaired corneal sensation with patients having hypopigmented facial patches and those without facial patches is shown in Table 2. The excessive corneal sensory impairment among cases as compared to controls was tested after adjusting for age, and the weighted OR (Mantel-Haenszel) was 3.99 (p <0.001). Anesthesia over the face was seen in 16 patients (19.5%) with hypopigmented facial patches and in 13 patients (15.9%) without hypopigmented facial patches. This difference was not significant. The relationship between corneal sensory impairment and facial anesthesia in both cases and controls is given in Table 3. Corneal sensory impairment among cases as compared to controls, after adjusting for anesthetic areas over the face, showed a weighted OR of 3.66 (p <0.001). The locations of hypopigmented patches on the face and their association with eye complications are given in Table 4. None of the ocular complications was significantly associated with the location of the hypopigmented patch on the face. There was also no significant association found between hypopigmented facial patches and smear positivity, antileprosy treatment, and duration of disease.

TABLE 2. *Corneal sensory impairment in cases and controls by type of leprosy.*

Leprosy type	No.	Corneal sensory impairment				Odds ratio
		Cases	%	Controls	%	
BT	40	21	52.5%	9	22.5%	3.51
BL	35	19	54.3%	10	28.6%	2.97
LL	7	4	57.1%	2	28.6%	3.33

DISCUSSION

Although hypopigmented areas over the face are fairly common, areas of anesthesia over the face have not received much attention, except in a few studies ([1]). This is predominantly due to the notion that because the face is richly supplied by the sensory nerves of the trigeminal nerve, anesthetic lesions over the face are extremely rare ([3]). Our study proves this to be a questionable supposition since examination of sensation over the face using a Semmes-Weinstein monofilament which gave a force of 0.05 grams revealed that 19.5% of the patients with hypopigmented patches and 15.9% of the patients without hypopigmented patches had sensory deficits over the face. The distribution of hypopigmented patches over the face did not conform to any particular pattern, although slightly more patches were found over the sensory area supplied by the ophthalmic branch of the trigeminal nerve than over the maxillary and mandibu-

TABLE 4. *Location of facial patches and ocular complications.*

Location	No.	Decreased vision		Madarosis		Lagophthalmos		Other complications[a]	
		No.	%	No.	%	No.	%	No.	%
Around right eye	39	7	17.9%	3	7.7%	6	15.4%	8	20.5%
Around left eye	38	7	18.4%	4	10.5%	5	13.2%	7	18.4%
Forehead	39	7	17.9%	5	12.8%	6	15.4%	9	23.1%
Temple	30	6	20.0%	2	6.7%	3	10.0%	6	20.0%
Cheek	70	11	15.7%	6	8.6%	7	10.0%	18	25.7%
Chin	25	7	28.0%	3	12.0%	2	8.0%	7	28.0%
Central face	15	2	13.3%	1	6.7%	9	60.0%	4	26.7%

[a] Other complications = Cataract, pterygium, corneal opacities, iridocyclitis.

lar branches. Most patches overlapped and were not confined to the areas supplied by any one of the three major divisions of the trigeminal nerve.

The important finding in this study is the association between the presence of hypopigmented patches on the face and decreased corneal sensation. Patients with hypopigmentation over the face were three to four times more likely to have impaired corneal sensation than patients without any hypopigmented facial patches. The location of the hypopigmented patches over the face did not significantly alter this association. Patches around the eye and over the zygomatic area were equally as significant as those over the nose, forehead and chin. Increasing age can decrease corneal sensation, but our study showed that even after adjusting for age, the significance of association between decreased corneal sensation and hypopigmented patches over the face remained almost the same. Anesthesia over the face together with hypopigmentation proved to be more significantly associated with decreased corneal sensation than anesthesia over the face without hypopigmentation ($p < 0.001$).

Since the pathology underlying the visible hypopigmented facial patches overlie the peripheral sensory nerves of the trigeminal nerve, there is an increasing chance that other peripheral branches of the trigeminal nerve may also be affected. The cornea is supplied by several sensory nerves that are derived primarily from the ophthalmic branch of the trigeminal nerve. Whatever may be the mechanism of association between the hypopigmented patches over the face and impaired corneal sensation, clinically, it provides a method by which impaired corneal sensation can be deduced without actually testing for it directly. At present, the only indicator of decreased corneal sensation among leprosy patients who are being assessed in the field is the reduced or abnormal blink rate. Direct estimation of corneal sensation using the cotton wisp in the field is not advocated by the World Health Organization ([6]) since the test itself, if not properly performed, can lead to destruction of the corneal epithelium and its attending problems. Therefore, we recommend that, along with the blink rate, hypopigmented lesions over the face be considered as indicators of corneal sensory impairment among leprosy patients. These patients should be given priority in the care of their eyes since their eyes are more vulnerable to injury. A more detailed study using the Cochet and Bonnet esthesiometer instead of the cotton wisp in estimating the corneal sensory threshold in larger numbers of leprosy patients is needed to substantiate the finding of this study.

SUMMARY

Eighty-two leprosy patients with hypopigmented patches over the face (cases) and an equal number of age-, sex-, and classification-matched leprosy patients without any hypopigmented patches over the face (controls) were examined for the distribution of hypopigmented facial patches, areas of anesthesia over the face, and eye complications. The hypopigmented patches did not follow any pattern and overlapped in the areas of sensation supplied by the three branches of the trigeminal nerve. Anesthesia over the face, evaluated by a Semmes-Weinstein monofilament which exerted a force of 0.05 grams, was present in 19.5% of the cases and 15.9% of the controls. Patients with hypopigmented facial patches

were found to have more corneal hypoesthesia than patients who did not have hypopigmented facial patches. The risk of having impaired corneal sensation was three to four times higher in patients with hypopigmented facial patches. This feature can be used to identify decreased corneal sensation among leprosy patients under field conditions where direct estimation of corneal sensation is not advocated.

RESUMEN

Un grupo de 82 pacientes con lepra, con manchas hipopigmentadas sobre la cara (casos), y un número igual de pacientes sin ninguna hipopigmentatición facial (controles), se examinaron para establecer la distribución de las áreas de anestesia en la cara y la frecuencia de complicaciones oculares. Las manchas hipopigmentadas no siguieron ningún patrón y se sobrepusieron en las áreas de sensación innervadas por las tres ramas del nervio trigémino. La anestesia sobre la cara, evaluada con un monofilamento de Semmes-Weinstein que ejerce una fuerza de 0.05 gramos, estuvo presente en el 19.5% de los casos y en el 15.9% de los controles. Los pacientes con manchas faciales hipopigmentadas presentaron más hipoanestesia de la córnea, que los pacientes sin hipopigmentación en la cara. El riesgo de presentar alguna alteración en la sensación de la córnea fue 3 a 4 veces mayor en los pacientes con manchas hipopigmentadas. Esta caracteristica puede usarse para identificar aquellos pacientes con disminución en la sensación corneal bajo condiciones de campo, donde no es posible hacer mediciones directas.

RÉSUMÉ

Quatre vingt deux patients atteints de lèpre présentant des aires hypopigmentées sur la figure (cas) et un nombre identique de patients hanséniens contrôlés en ce qui concerne l'âge, le genre et la classification (contrôles) furent examinés pour la distribution des plaques hypopigmentées faciales, les aires anesthésiées sur la figure et les complications oculaires. Les plaques hypopigmentées ne suivaient pas d'aires définies et se chevauchaient dans les aires de sensibilité des trois branches du nerf trijumeau. L'anesthésie faciale, évaluée par le filament de Semmes-Weinstein qui exerçait une force de 0,05 grammes, était présente chez 19.5% des cas et 15.9% des contrôles. Les patients présentant des plaques hypopigmentées avaient plus d'hypoesthésies de la cornée que les patients sans plaques hypopigmentées faciales. Le risque d'avoir une diminution de la sensitivité de la cornée étaient trois à quatre fois plus élevée chez les patients présentant des plaques hypopigmentées faciales. Cette caractéristique peut être utilisée pour identifier une baisse de sensitivité de la cornée parmi les patients hanséniens dans les conditions du terrain où l'estimation directe de la sensitivité cornéenne n'est pas pronée possible.

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