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Observations on the Macular Series in African Leprosy[1]

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A recent article ([5]) entitled "Low-resistant tuberculoid leprosy" sheds further welcome light on the controversial problem of the nature of certain macular lesions occurring in leprosy. Leiker's contention that the relatively homogeneous variety he considers should be placed "at the tuberculoid side of [a] wider intermediate, dimorphous or borderline group" will gain widespread acceptance, as will the criteria he admits for the differentiation of these macules from those of borderline, reactional tuberculoid and indeterminate leprosy. There is a general concordance between his observations from Northern Nigeria and our own from the Eastern Region.

The present study concerns 94 patients admitted to the Research Unit, Uzuakoli Leprosy Settlement, during the past six years and presenting well-defined macular lesions, most of which might, if only the clinical findings are taken into account, be satisfactorily accommodated within the subgroup "low-resistant tuberculoid." In order to uncover the underlying pathology, however, the histopathologic and bacteriologic aspects have been studied, and the patients have been followed individually for long periods, for it is evident that a single naked-eye examination made at a given moment during the slow evolution of a lesion or when its aspect has been modified by treatment, rarely provides sufficient grounds for its precise identification or the classification of the variety of leprosy of which it is the principal and most obvious manifestation.

This study thus is concerned solely with patients whose lesions have been consistently macular and well-defined from the beginning. Purposely excluded, therefore, are the varieties of flat lesions that were once raised.

Leiker's assertion that "a large proportion of the cases classified as macular dimorphous . . . fit into the low-resistant tuberculoid group" is true to fact in Eastern Nigeria.

LOW-RESISTANT TUBERCULOID

The largest group in this series (60 patients) presented skin lesions that conformed to Leiker's description of low-resistant tuberculoid.

The lesions were multiple, very well-defined, and uniformly hypopigmented. Repigmentation under treatment was slow (taking commonly from three to five years or longer) and uniform; i.e., there was little or no tendency to central healing. Some patients were left with some degree of permanent hypopigmentation after seven years of treatment.

In patients with extensive disease prone to relapse, nerve damage was frequently widespread and symmetric. In others it was absent or minimal.

Bacteriology. In 14 patients the initial smears showed scanty bacilli in the skin, ear lobes, or nasal mucosa, or in more than one of these sites. The percentage of solid rods was low in most patients, of the order of 0-50, but in two it was 98. Solid rods disappeared within six weeks on the average. Excluding two patients in whom acid-fast material persisted in the smears for 12 and 14 months respectively, in the remaining patients they disappeared in an average of ten weeks.

The patients whose smears were positive on the first examination were examined on the average on 11 subsequent occasions, while the remainder were examined on an average on five occasions: only once in these latter patients did the smears show *M. leprae*.

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Histology. The characteristic picture was of mild tuberculoid leprosy, with scattered streaks and clumps of round cells, and rare giant cells; cuffing and round-cell infiltration of nerve twigs in the papillary layer of the dermis; and occasional *M. leprae* in these nerves.

MACULOANESTHETIC

A smaller group (of seven patients) had larger, and fewer, well-defined macular lesions, very dark red in color, set in a deeply pigmented and often a naturally thick skin. On the trunk these macules were sometimes symmetrically distributed, following the intercostal nerves. Often a lesion in the loin or abdomen abutted upon but did not transgress the midline.

In five patients with skin of lighter hue, the macules were bright coppery or orange-red in color or dull yellow-brown, with a furfuraceous surface.

Superficial sensation—light touch, temperature and pain—was slightly and uniformly impaired within the lesions, and also sometimes in a narrow zone of apparently normal skin surrounding the lesion.

Cutaneous nerves lying in the vicinity of some lesions (noticeably those in the scapular region and in the neighborhood of the elbow or the knee, and on the anterior aspect of the thigh) were often enlarged, hard, and exquisitely tender on palpation.

Another small group comprised those patients (four in number) with a single macule, large or very large. The hypopigmentation was uniform, with rarely a very slight tendency to irregular central healing and repigmentation. The color of the lesion was bright coppery or orange. While the lesion could not be said to be raised above the level of the surrounding unaffected skin, its surface was seen (under a loupe) to be uniformly micropapulate. Loss of superficial tactile sensation was marked. Sweating was seriously impaired, and hairs were lost. Repigmentation was extremely slow, even despite attempts at stimulating the melanocytes with local irritant preparations.

Bacteriology. Bacilli were never found in these lesions, even on repeated examination of the spreading margin.

Histology. The histologic picture in all these differing lesions was tuberculoid, but the intensity of the cellular infiltration varied from scarcely discernible focalization of round cells to a typically vigorous reaction, with well-marked giant cells and intense infiltration.

Thus, a total of 16 patients had lesions that could be classified as maculoanesthetic.

MACULAR DIMORPHOUS

Eighteen patients had completely flat, well-defined and uniformly hypopigmented multiple lesions that were consistently, and often highly, positive bacteriologically. On clinical grounds alone, the lesions are indistinguishable from and are often called "low-resistant tuberculoid."

Bacteriology. The nasal mucosa invariably contained *M. leprae*, often very abundant, and the smears showed numerous globi. The average Bacterial Index (B.I.) was 1.1; on the average, 58 per cent of the bacilli were morphologically normal, and these normal bacilli disappeared from all sites smeared in an average of 3.2 months. The last traces of acid-fast debris disappeared from all sites smeared in an average of 15.3 months.

Globi were present at all sites where bacilli were present in the smears; mostly, these globi contained the usual number of bacilli found in Africa, but some would better be termed "clumps" and contained a dozen or so organisms.

Histology. The histology was in conformity with these bacteriologic findings, being characterized by the presence of foamy cells filled with *M. leprae*. Sometimes foamy cells were present typically in the deeper layers of the dermis, the papillary layer showing a predominantly tuberculoid focalization of lymphocytic infiltrate.

The concurrence of these clinical and pathologic features excludes these fully "determined" lesions from the indeterminate group. Although the clinical appearances of the lesions are identical with those of low-resistant tuberculoid, this group is in reality far from the tuberculoid pole, as is shown by the bacteriologic and histologic findings.

DISCUSSION

The patients here considered all presented well-defined and uniformly hypopigmented (flat) macules. The aspect of the individual lesions was stable; both the definition of the margins and the uniformity of the hypopigmentation persisted for long periods. During treatment, repigmentation was slow and uniform, and it was only *late* that the margin lost its sharp definition. These macules cannot therefore be considered as unstable or transitional: *qua* macules, they form a distinct and "determined" group, highly characteristic. That the assessment of these distinctions is no mere sterile academic exercise is shown by the very wide range of gravity and prognosis represented, and the epidemiologic importance of lesions unsuspectedly positive bacteriologically.

The lepromin test in these different groups provided no differentiating data ([3]). In other words, it varied between individuals in each clinical grouping, being on the whole slightly positive (i.e., from 2 mm. to 6 mm. in diameter on the 21st day).

The low proportion of bacteriologically positive and histologically "mixed" lesions in this series from Eastern Nigeria (18 out of 94) is in contrast with the series reported by Browne ([1]) from the Belgian Congo, in which no fewer than 50 out of 62 patients had highly positive smears, both from the lesions themselves (a Bacterial Index of 2.0-3.0 in Dharmendra's notation —maximum: 40), and from the ear lobes and the nasal mucosa, with definite globi or at least clumps of a dozen or more aggregated bacilli in each microscopic field.

The persistent absence of infiltration in the Eastern Nigeria patients that were bacteriologically positive for prolonged periods, virtually excludes them from the borderline group as generally accepted, "the skin lesions of which are usually seen as plaques, bands, nodules, etc." ([4]). Not alone, Gay Prieto vigorously opposes the suggested introduction of the term "macular dimorphous" to delimit this group, and following the description of de Souza Lima and Alayon advocates a return to their term "uncharacteristic."

Although the Bacterial Index in the Congo series was definitely higher than that in Nigeria, the histologic picture was very similar: in different parts of the same lesions, or at different depths of the same section, features typical of lepromatous and of tuberculoid leprosy were found both in the untreated patient and also in sections taken at various stages during treatment. The more usual combination was a focalized round-cell infiltrate in the papillary layer of the dermis, with intraneural as well as perineural infiltration of the twigs in the neurovascular complexes between the rete pegs, and masses of lepra cells in the deeper reticular layers, shown, by Fite-Faraco staining, to be filled with *M. leprae*.

The actual nomenclature employed is of less importance than the recognition that these macular lesions occupying part of the broad zone intermediate between the typically tuberculoid and the typically lepromatous may comprise numerous types whose relative frequency may vary considerably between one country and another. In Eastern Nigeria, the bulk of such lesions are consistent with Leiker's "low-resistant tuberculoid." Except for the sensory impairment, which is slight, many would fall into the maculoanesthetic group of the Indian leprologists ([2, 3]). Histologically, most are pretuberculoid or early tuberculoid. If, however, the pathologic term "tuberculoid" has now, by prolonged particularization, attracted as a necessary part of its clinical connotation the concept of visible elevation of at least the edges of the lesion, then the objections raised to the use of the term "*macular* tuberculoid" can be appreciated, and "low-resistant tuberculoid" is almost a contradiction of terms.

The practical conclusion to emerge is that field workers having no access to the refinements of histology and lepromin testing, should wherever possible make slit-smear examinations of these well-defined uniformly hypopigmented macules, as an indispensable preliminary to classification, treatment and prognosis. Moreover, to avoid serious reactions in these unstable patients, treatment should be extremely cautious, with low doses of dapsone.

It may be that if the slit-smear technic

is modified for these patients with macular lesions, so that material is obtained from the reticular rather than from the papillary layer of the dermis, a higher proportion would be found to be bacteriologically positive.

SUMMARY

Completely flat and well-defined leprosy lesions, uniformly hypopigmented and showing some degree of tactile loss, may be pathologically dissimilar. The bacterioscopic findings vary within wide limits, and the histologic appearances may likewise differ considerably. All such lesions might be termed "macular tuberculoid" if the clinical aspects were the sole criterion.

In Africa, a high proportion of these macular lesions would conform to Leiker's "low-resistant tuberculoid," but some appear to fit better into the Indian "maculoanesthetic" description. Others, again, indistinguishable on purely clinical grounds from these, are in reality far from the tuberculoid pole when the bacterioscopic and histologic findings are taken into consideration.

The proportions of these diverse macular manifestations of leprosy, all nonlepromatous, may vary from country to country. Their pathologic interest is matched by their epidemiologic importance.

RESUMEN

Las lesiones completamente planas y bien definidas, uniformemente hipopigmentadas y mostrando cierto grado de pérdida táctil, pueden ser patologicamente disimilares. Los hallazgos bacteriológicos pueden variar dentro de amplios limites, y el aspecto histológico puede a su vez diferir considerablemente. Todas estas lesiones pueden ser denominadas "maculas tuberculoides" si el aspecto clínico fuera el único criterio.

En Africa, una gran proporción de estas lesiones maculares conformarian a la "tuberculoide de baja resistencia" de Leiker, pero algunos parecen estar mejor en la descripción de India "maculo-anestésica." Otros, otra vez, indistinguibles solamente en sus bases clínicas de estas, estan en realidad lejos del polo tuberculoide, cuando se toman en consideración los hallazgos bacterilógicos e histológicos.

Las proporciones de estas diversas manifestaciones de la lepra, todas no lepromatosas, pueden variar de pais a pais. Su interes patológico se iguala por su importancia epidemiológica.

RÉSUMÉ

Des lésions de lèpre complètement planes et bien définies, uniformément hypopigmentées et présentant une perte plus ou moins prononcée de la sensibilité tactile, peuvent néanmoines être dissemblables au point de vue pathologique. Le résultat des examens bactérioscopiques peut varier considérablement, de même que l'aspect histologique peut montrer des différences fort notables. Si l'aspect clinique constituait le seul critère, toutes les lésions de ce type pourraient être englobées sous le terme de "tuberculoïdes maculeuses."

En Afrique, une proportion élevée de ces lésions maculeuses répondraient à se que Leiker a décrit sous le vocable de "tuberculoïde de faible résistance," mais certaines toutefois semblent répondre davantage à la description de "maculo-anesthésique" des léprologues Indiens. Quant à certaines autres, qui sont également indiscernables des précédentes sur la base de critères purement cliniques, elles sont éloignées du type polaire tuberculoïde lorsque l'on prend en considération les résultats des examens bacterioscopiques et histologiques.

Les diverses proportions de ces différentes manifestations maculeuses de la lèpre, qui toutes sont non-lépromateuses, peuvent varier de pays à pays. Leur intérêt d'un point de vue pathologique a pour égal leur importance sur le plan épidémiologique.

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