Annals of the Royal College of Surgeons of England (1975) *vol* 57

ASPECTS OF DIAGNOSIS*

Importance of nasal lesions in early lepromatous leprosy

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Summary

There are some 20 million people in the world with leprosy. In the lepromatous form of the illness the nose becomes infected very early in the disease process. The nasal discharge which occurs is heavily bacillated and is the most potent source of exit of Mycobacterium leprae *from the body. The necessity for early diagnosis and treatment of leprosy in the absence of an effective vaccine is discussed and the pathological changes that occur in the nose are outlined. The roles which the leprologist and the rhinologist are able to play are mentioned.*

Introduction

Leprosy is common in certain parts of the world and it has been estimated that there are 20 million people who suffer from the disease. The worldwide pattern of incidence is shown in the map on p. 310. The disease is caused by *Mycobacterium leprae,* a microorganism similar to that which causes tuberculosis. *Myco. leprae* has not yet been grown on an artificial culture medium, although experimental animals—notably the mouse[1] and the armadillo[2]—can be readily infected. Therefore there is no effective vaccine against leprosy and present methods of controlling the transmission of the disease are based on diagnosis and effective treatment of all infectious cases. When a person is exposed to *Myco. leprae* the clinical form of the disease which develops depends on that person's innate immunological response to the infection. Ridley and Jopling[3] classified the different clinical types of leprosy in the form of a "spectrum" (see table on p. 310).

Over the past 50 years it has been suggested from time to time that early cases of lepromatous leprosy, with bacillated nasal discharge but with minimal external signs of the disease, could spread leprosy within the community. These suggestions were largely ignored and little attention paid to the human nose until Davey[4], working at the Victoria Hospital, Dichpalli, India, began to examine the noses of patients with early lepromatous leprosy. As a result of his initiative several studies, involving leprologists, pathologists, and myself (an ear, nose, and throat surgeon), have clarified the part played by the nose in lepromatous leprosy.

In the past the most commonly held view has been that prolonged exposure to a person with lepromatous leprosy, with direct skin-to-skin contact, was necessary before the disease could be transmitted. Inhalation and ingestion have also, of course, been postulated

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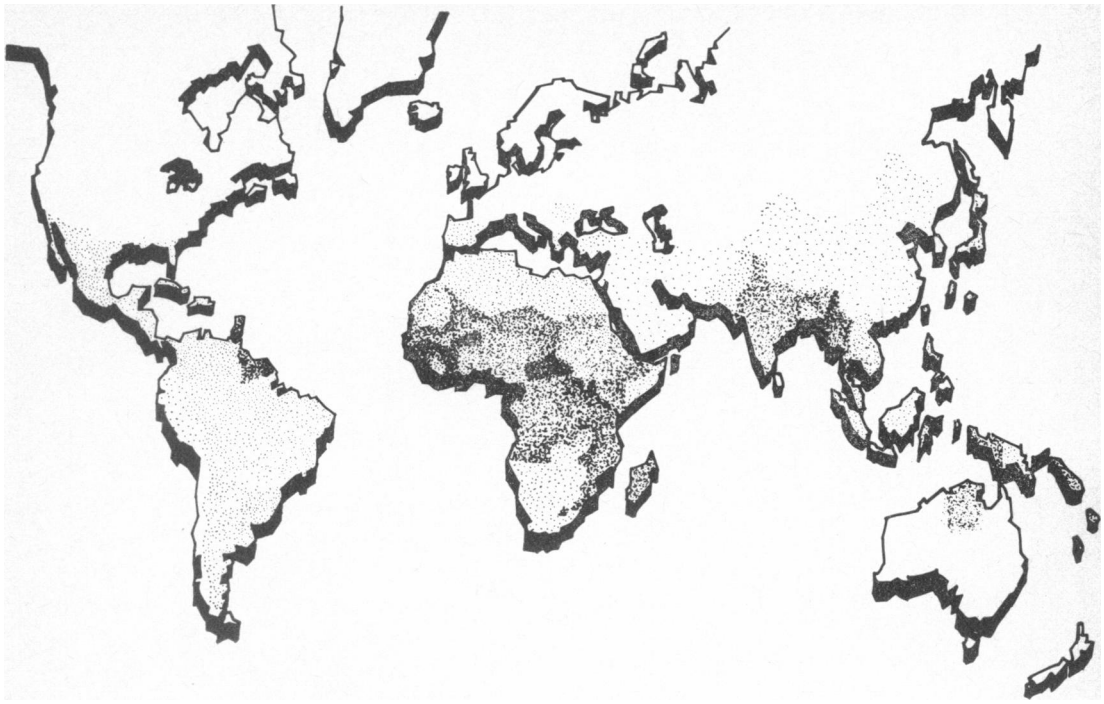

as possible routes of entry of *Myco. leprae* into the body, and many workers have attempted to demonstrate, without success, an arthropod vector. Furthermore, in the past patients confined to leprosaria were frequently those with obvious external deformity. These fall into two main groups: firstly, patients with BB–TT leprosy with orthopaedic problems due to nerve involvement, and secondly, advanced 'burnt out' cases of lepromatous leprosy. It is now recognized that the former are not infectious and that the latter group, often having received a certain amount of antilepromatous chemotherapy, have passed beyond the phase of infectivity. It is now accepted that 'infectious leprosy' is synonymous with early untreated lepromatous leprosy and therefore to diagnose the disease at this stage is clearly most important.

Methods and observations

The high prevalence of nasal involvement in lepromatous leprosy has been recognized

Classification of leprosy[3]

	Lepromatous	*Borderline*	*Tuberculoid*	*No clinical disease*
Subgroup	. . LL . . BL . . BB . . . BT . . . TT . .			
Resistance of patient	Nil	Moderate	High	Complete
Nos. of *Myco. leprae* in body	High	Moderate	Low	Nil

for many years. A typical finding is that of Dharmendra and Sen[5], who noted the presence of *Myco. leprae* in over 90% of nasal scrapings in a large series of lepromatous cases. These figures have been substantiated recently, both clinically and bacteriologically. Thus 33 (97%) of 34 patients with early lepromatous leprosy had clinically recognizable lepromatous involvement of the nasal mucosa[6], while the nasal smears of 97 out of 100 consecutive lepromatous patients showed positively identifiable *Myco. leprae*[7].

In the majority of the patients with early lepromatous leprosy examined during the course of these studies the external manifestations of their lepromatous disease were minimal, amounting to no more than a fine generalized infiltration of the skin, often most noticeable on the brow, chin, and pinna, with thinning of lateral eyebrow hair and some dryness of the palms and soles. However, when the nose was examined a very different picture emerged. Patients with the earliest possible systemic signs showed obvious and often extensive abnormalities of the nasal mucosa. The first intranasal change specifically recognizable as leprosy is a pale thickening, often yellowish, of the mucous membrane. This is most frequently a generalized nodular infiltrate, but discrete raised nodules or plaques up to 5 mm across may be seen arising from areas of mucosa that to inspection appear otherwise normal. As the disease progresses infiltration of the mucosa increases, causing obstruction of the nasal airways. Inflammation of the mucosa, at times amounting to true ulceration, is seen, and if the pathological process continues unchecked by any treatment destruction of the cartilaginous and bony framework of the nose occurs, resulting in the typical picture of external deformity and chronic atrophic rhinitis. By gently scraping the nasal mucosa and making a smear the diagnosis may be confirmed if acid-fast bacilli are seen. This test is analogous to the commonly used 'skin smear' test.

The secretions of the nose in lepromatous leprosy are of considerable importance. Early in the illness a copious mucoid or mucopurulent discharge is very often present. For diagnostic purposes a single or 24-h specimen of the nasal discharge may be readily collected in a small polyethylene bag. The numbers of acid-fast bacilli present may be counted or the specimens used to infect experimental animals. This discharge contains huge numbers of *Myco. leprae,* which are capable of causing lepromatous infection in mice even after the secretions have been isolated in dry conditions outside the body for periods of up to 7 days[8]. The daily nasal discharge of *Myco. leprae* can be as great as 1.5×10^9 and greatly exceeds the number shed from the skin or excreted in the urine or faeces. In view of the proven infectivity of this outpouring of *Myco. leprae* from the nose it would seem acceptable that this is the mechanism whereby a person with early lepromatous leprosy normally transmits the disease. The routes by which the bacilli pass from the mucous membrane of the nose into the nasal discharge itself have been studied recently both in mice[9] and in humans[10]. Furthermore, the nasal mucosa is clearly an additional and important 'site of predilection' for *Myco. leprae*[6], and though it would be premature to state that the nose is definitely the portal of entry into the body, this supposition is theoretically attractive. The relevant arguments are discussed more fully in several articles and in an important editorial in *Leprosy Review*[11].

Discussion

The epidemiological consequences of these observations clearly require further study, but the immediate message is clear. Leprologists must pay as much attention to the nose in

lepromatous leprosy, both clinically and bacteriologically, as they already do to the systemic manifestations of the disease. In control programmes large numbers of people are screened in order to diagnose leprosy in the early stages, when treatment will best prevent both the still potentially awesome consequences to the individual and also its spread within the community. All those screened should be asked about the presence of nasal symptoms and if there is any suspicion of leprosy the nose should be examined. This also applies should the diagnosis be suspected in a general surgical or medical outpatient clinic. The basic technique of nasal examination with a torch and speculum is easily learnt, and when abnormalities are detected the presence of *Myco. leprae* should be sought in the nasal discharge or superficial layers of the mucosa as described above.

ENT surgeons in endemic areas will normally be aware of the possibility of encountering cases of leprosy, but those working in countries where the incidence is low should nevertheless bear the diagnosis in mind, particularly in immigrant patients with nasal symptoms and an abnormal nasal mucosa.

Biopsy of the nasal mucosa, carried out under a local anaesthetic, is a relatively minor procedure which may be valuable diagnostically. The anterior end of the inferior turbinate is the site most likely to yield a positive result in lepromatous leprosy[6].

The treatment of the nasal lesions in leprosy is discussed in detail elsewhere[12,13] and it is an important aspect of the overall management of patients with the lepromatous form of the illness. The value of early adequate systemic therapy is undeniable and the old ideas of leprosy being incurable are now quite untenable. The number of bacilli in the nasal discharge is reduced to nearly zero within 2 months of starting treatment with dapsone[8] and even within 10 days with the newer (and more expensive) drug rifampicin[14]. It is still, however, important to treat the nasal lesions themselves vigorously until such time as they begin to regress under the influence of antilepromatous chemotherapy. This is particularly important in the more florid infections, when careful local treatment of the nasal lesions may do much to prevent external deformity of the nose.

Finally, if it is the responsibility of all doctors, including leprologists, to be aware of the possibility of diagnosing lepromatous leprosy in its earliest stages by recognizing the intranasal changes and by realizing the significance of what they see, then it is clearly the task of the interested rhinologist to offer the benefits of his specialized knowledge to those who are concerned with this fascinating disease.

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