

center of the internal ring appeared to be the original site of the lepromin injection. Both internal and external borders of the ulcer were irregular, elevated, and perpendicular to the base; both ulcers were covered with an eschar. No systemic symptoms or signs were noted. The supratroclear lymph node was enlarged and tender; the axillary nodes were just palpable. The patient was treated with broad-spectrum antibiotics and care of the wound. After 7 days most of the eschar had fallen off (photographs were taken at this time), and the lesion healed with minimal scarring in about 3 weeks. (Figures are self-explanatory.)

Such a hyperactive reaction to lepromin A, to our knowledge, has not been reported and, in any case, such extensive ulcerations following a lepromin injection are not very

common. The patient refused to undergo biopsy of the ulcer or any blood test.

It is interesting to note that ulcers developed—one on an area previously occupied by a TT patch and the other 5 cm away from the site of the lepromin injection. A few hundred patients have been injected with the same Dermo-O-Jet but only this patient reported with a hyperactive reaction. We report the case for its peculiar features.

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Skin Smears and Bacterial Index in Multiple Drug Therapy

TO THE EDITOR:

The letter by Drs. Georgiev and McDougall on skin smears and the bacterial index (BI) (IJL 56:101–104, 1988) gives an opportunity to share with them some of our feelings. Our comments in this often discussed but neglected subject are as follows.

OBSERVATIONS

Laboratory infrastructure. Although high level groups of experts have commented on the inadequacy of smear laboratories, in reality the matter has not moved from theoretical discussion to practice. Most laboratory technicians take a smear reporting job as a last resort. They find it unrewarding compared to the monotonous and strain-some job they do. As per the report of the independent evaluation of NLEP in India, "only 40.5% of the 823 sanctioned posts are filled of which about 10% are untrained." (1) Many peripheral laboratories are under-equipped. There is a lack of standardization in every step of the smear technique. The few guidelines prepared do not reach the peripheral labs.

Smear reporting as a diagnostic aid. All types of fully evolved leprosy cases can be

diagnosed by clinical features alone, and a smear report is mostly limited to early BL and LL cases and those paucibacillary (PB) cases which eventually evolve to the multibacillary (MB) form of the disease, due to irregular therapy.

Smear reporting as an aid to classification. A large number of cases can be grouped in the MB and PB groups by their clinical presentations. In these cases the smear report is confirmatory. A clinician generally depends on the smear report to classify the following cases: a) most of the borderline cases; b) rare BL and LL cases presenting with a single or a few lesions; and c) dapsone-resistant cases which sometimes have atypical presentations.

BI and MI as indicators of effective chemotherapy. Granular bacilli persist in dermal granulomas long after the cessation of clinical activity. Reports to the effect that nonsolid bacilli grow in the mouse foot pad are scanty, and this important aspect needs further study. It is a common observation that in the majority of cases the morphological index (MI) falls appreciably, following chemotherapy, more so if the initial MI is high.

There is an apparent increase in the BI after fragmentation/granulation. An average BI of many sites/patients is sometimes falacious, and a change in the BI is meaningful only in individual cases.

SUGGESTIONS

Keeping in view the inadequacies in smear laboratories and the lack of standardization in smear techniques, the program managers may consider to:

a) organize one central laboratory after mobilizing men and machines from all field smear laboratories. The central laboratory will cater to only the selected cases indicated earlier.

b) overclassify (to err toward MB) in doubtful cases. The stage of the disease as reflected in the number of nerves and skin sites involved is very important. A good number of smear-negative cases with multiple nerve and skin lesions continue to be active after 12/24 doses of multiple drug therapy (MDT) with two drugs. Hence, when in doubt it is safer to overclassify MB and treat with three drugs.

c) define a cut-off point to stop therapy. There are reports that the BI continues to decrease after cessation of therapy^(2,3). A WHO study group⁽⁵⁾ even recommends that the duration of treatment for MB cases should be "at least 2 years" and preferably until "smear negativity." Irregularity in drug compliance is to some extent inevitable if the treatment is prolonged. This is more so in a disease (as leprosy) where regularity does not show the patient an apparent benefit, nor irregularity immediate harm. The fact that nonsolid bacilli grow in the mouse foot pad needs to be established. In view of these facts, it is suggested that the absence of solid and fragmented bacteria in a clinically inactive case may be taken as bacterial inactivity and as the cut-off point for discontinuing treatment.

d) liberalize the process of smear reporting. Regarding the accuracy of smear grading, the following points are worth reconsidering: MI, SFG, and other sensitive indices are in vogue in a few institutions, but with the present laboratory set up these do not appear to be feasible in field situations. *Mycobacterium leprae* is a peculiar pathogen in the sense that its absence in the smear does not exclude the disease. About

80% of cases are smear negative. In contrast to other bacterial diseases, the cure is not founded in microbiological criteria. The extent of tissue damage is not commensurate with the bacterial load. The bacilli have a varied morphology. An acid-fast granule, fragment and rod each individually enjoy the status of a bacterium. The number of bacilli in a microscopic field can be anything from 1 to >1000, and any count whatsoever deserves treatment with three drugs for at least 2 years. In such a state of affairs, precise grading is neither possible nor required. As in any other bacterial disease, why not concentrate our limited resources and energy on reporting positive or negative with reasonable accuracy?

Grading gives the density of bacilli in a patient. For this, a less comprehensive grading which can be done by visual impression alone (as proposed below) will suffice:

<100 = 1+ = Few (F)
100–1000 = 2+ = Numerous (N)
>1000 = 3+ = Innumerable (I)

This will give a rough idea of the bacterial load as the source of infection. Such less-precise grading has already been advocated and practiced⁽⁴⁾.

A word for the smear reporter. He and his laboratory are equally as important as the smear report. His morale needs to be upheld by a realistic workload and by healthy working conditions.

Our comments are intended as a temporary compromise, and are not made to negate the value of the smear examination.

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Search for Leprous Infection in Some Small Wild Animals of Louisiana

TO THE EDITOR:

It has been reported by several workers that wild armadillos (*Dasypus novemcinctus*) have lepromatous leprosy similar to the disease produced in experimental infections with *Mycobacterium leprae* (⁴⁻⁶). Each animal with advanced disseminated disease has approximately 200 g of infected tissue and each gram contains approximately 10¹⁰ organisms (³). Upon death, the armadillo carcass is often eaten by other animals and what is left disintegrates and gets mixed in with the soil. With that much load of infected material in the environment, it is possible that other animals which share the same environment, living in burrows and even consuming dead armadillos, might contract the disease.

In our earlier study it was found that histopathological examination of both ears of those armadillos killed on the road by automobiles was an effective and simple method for surveying wild animals for the leprosy infection (²). In that study, 2.02% of the 494 armadillos examined had the disease.

We report here the results of a similar study of four other animals sharing the same environment with armadillos. Both ears from 51 rabbits, 56 nutria, 17 raccoons, and 311 opossums killed on the road by automobiles were collected. Of these, one pair of rabbit ears and eight pairs of opossum ears were decomposed and therefore were discarded. All of the other specimens were fixed in 10% Formalin and processed for paraffin sections; 5 µm sections were cut, stained with a modified Fite's stain (¹), and examined microscopically under oil immersion. The distribution of animals ac-

ording to the parishes in Louisiana is given in The Table.

None of the specimens studied showed acid-fast organisms. Thorns associated with foreign-body reaction and granuloma formation were detected in 2 rabbits, 3 raccoons, and 3 opossums. One specimen from an opossum showed an unidentified fungal granuloma. Granulomatous inflammation with no identifiable etiologic agent was present in the specimens of two nutria and 15 opossums. Skin ulcers were seen in 21 and acute abscesses in six specimens from opossums.

In conclusion, *M. leprae* infection was not detected in samples of four species of ani-

THE TABLE. *Distribution of animals sampled by Louisiana parishes.*

Parish	Rabbits	Nutria	Raccoons	Opossums
Ascension	32	11	5	185
Iberville	8	1	3	73
East Baton Rouge	6	1	4	34
Livingston	1			1
Tangipahoa			1	2
West Baton Rouge	1			3
Jefferson Davis			1	1
St. Martin	1		2	
St. John the Baptist	1	1	1	1
St. James	1	1		1
St. Charles		20		
Iberia		10		
Terrebonne		6		
St. Mary		5		
West Feliciana				3
East Carroll				3
St. Landry				1
Avoyelles				1
Tensas				1
Madison				1
Total	51	56	17	311