Article published online: 2020-01-29

Original Article

Significance of Histopathology in Leprosy Patients with 1–5 Skin Lesions with Relevance to Therapy

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ABSTRACT

Background: Patients with 1–5 skin lesions are clinically categorized as paucibacillary for treatment purposes. For betterment and adequate treatment of patients, this grouping needs further study.

Aim: To study a group of leprosy patients with 1–5 skin lesions, compare clinical details with histopathological findings and bacteriological status of the skin to evaluate the relevance of this grouping.

Materials and Methods: Two-year study involving 31 patients of leprosy with 1–5 skin lesions was included in this study. A number of skin lesions were recorded. Skin biopsies were taken in all patients. The biopsies were evaluated for the type of pathology and acid fast bacilli (AFB) status.

Results: Of 31 patients, 19 (61.2%) had single skin lesion, 7 (22.5%) had two lesions, 4 (12.9%) had three lesions, and only one (3.22%) had four lesions, there were no patients with five lesions. Of the 31 patients, 30 (96.7%) were clinically diagnosed as borderline tuberculoid and one patient (3.22%) has tuberculoid leprosy. Skin smears were negative for AFB in all patients. The histological diagnoses were: TT 1 (3.22%), BT 24 (77.41%), and IL 6 (19.2%). AFB were found in 2 (6.45%) out of 31 skin biopsies. Clinicopathological correlation was 76.6% in the BT group.

Conclusion: Tissue biopsy findings in 1–5 skin lesions which were not considered relevant for treatment purposes until now should be given a status in the categorization and assessment of severity of the disease. The significance of finding of AFB and histopathology of multibacillary (MB) type of leprosy in tissue biopsies, in patients grouped as PB should be resolved so that patients could be given the drug therapy and duration of therapy they warrant.

Keywords: Leprosy, paucibacillary, histopathological, bacteriological evaluation

INTRODUCTION

Leprosy patients with less than five skin lesions are grouped into paucibacillary (PB) group for treatment purposes without taking into account their size and extent of lesions or the number of nerves involved; the clinical classification of leprosy is not considered relevant. They are uniformly treated with PB multidrug therapy for a fixed duration of 6 months as per WHO recommendations. This group potentially consists of patients with diverse clinical, bacteriological, and histopathological features. This categorization of leprosy based on the number of skin lesions for treatment purposes is arbitrary and is purely for the convenience of field workers.

In 1998, the WHO expert committee on leprosy proposed MDT-PB for leprosy patients with 1–5 skin lesions but did not mention any scientific basis for such a recommendation except citing the nonreliability of skin smear services,[1] which were considered relevant till then.

As per clinical classification for control programs of 1982 by WHO, bacterial index < 2+ on Ridley scale was termed PB and that with bacterial index > 2+ was termed multibacillary (MB). This was changed in 1988, in which bacterial index of zero was considered as PB and the ones with bacterial index of 1+ or above as MB.

Access this article online

Quick Response Code:

Website: www.jlponline.org

DOI: 10.4103/0974-2727.78557

There has been a substantial decrease in the numbers of leprosy patients after the implementation of MDT for leprosy. In the National Leprosy Elimination Programme in India, the proportion of MB cases was seen to increase in states heading toward elimination.[2,3] However, this increase was marginal as PB cases still account for more than 60% of the leprosy cases in India in the year 2004. Study of this PB group for variations and patterns is not only important in the present context, but also relevant in devising future strategies in leprosy control programs. In this study, we analyzed the clinical, bacteriological, and histopathological features of this group of patients based on detailed clinical examination, skin smear findings, and skin histopathology.

MATERIALS AND METHODS

Thirty-one patients of leprosy with 1–5 skin lesions attending the Department of Dermatology, JJMMC, Davangere, Karnataka, over a period of 2 years were included in this study. There were 24 males and 7 females with the age range of 15–60 years. Clinical findings in these patients were recorded. The diagnosis was based on the presence of hypopigmented hypoesthetic skin lesions and cutaneous and/or peripheral nerve thickening. The clinical features, morphology, and number of lesions were recorded. Patients with reactions were excluded from the study. Slit skin smear and skin biopsy were performed on the most representative lesion in all patients. The sections were stained with hematoxylin and eosin (H&E) and modified Fite stain, and studied by pathologist. The type and character of granuloma and the presence of acid fast bacilli (AFB) were noted. The bacillary index of granuloma (BIG) was calculated in the tissue biopsy specimen.

RESULTS

Of the 31 patients, 19 (61.2%) had single skin lesions [Figure 1], 7 (22.5%) had two, 4 (12.9%) had three, 1 (3.22%) had four skin lesions. Their clinical classification was tuberculoid leprosy (TT) in 1 patient and borderline tuberculoid (BT) in 30 patients. Slit skin smear (SSS) for AFB was negative in all patients.

The histopathological findings of H and E stained skin biopsies were as follows: TT (1), BT (23) [Figures 2–5], IL (6) patients. The BIG values on modified Fite stain were 1+ in two biopsies which showed features of BT on histopathology [Table 1].

In the BT group, 23 out of 30 patients showed concordance, i.e., clinicopathological correlation was 76.6%. [Table 2].

The percentage of positivity of AFB was 0% in SSS, and 6.45% in skin biopsies.

DISCUSSION

Leprosy patients with 1–5 skin lesions are grouped together as PB for treatment purposes. This study reveals that patients with 1–5 skin lesions present with varied clinical and histopathological features which points to the nonhomogeneous nature of this group.

Two patients with clinical features of BT leprosy had BIG of 1+ on skin biopsy, which highlights the importance of Fite faraco stain on skin biopsies which reveals the presence of M. leprae bacilli better than SSS, thus indicating the importance of histopathology and AFB stain on skin biopsy to rule out MB type in patients clinically grouped as PB type.

The significance of our observation is that patients with 1–5 skin lesions do not have disease of similar severity, and can reveal AFB in few of them. It is known that clinical features in leprosy patients reflect only the gross morphology of the underlying pathological changes. Significant discrepancies have been reported between the bacteriological and immunological status of the nerve and skin compared to the clinical diagnosis.[4-6]

These features should also be considered while establishing treatment programs for leprosy.[7] It has been observed that a few BT patients harbor AFB in their nerves for many years, even though they become clinically inactive following MDT.[8] Explanation for this could lie in defective

Table 1: Skin biopsies with histopathological features and BIG

No. of lesions	No. of patients	Histopathology				BIG-skin biopsy				AFB, The present study
		TT	BT	BL	IL	1+	2+	3+	4+	In skin biopsy
1	19	–	16	–	3	2	–	–	–	2
2	7	1	4	–	2	–	–	–	–	–
3	4	–	3	–	1	–	–	–	–	–
4	1	–	1	–	–	–	–	–	–	–
5	–	–	–	–	–	–	–	–	–	–
Total	31	1	24	–	6	2	–	–	–	2 (6.45)

BIG, Bacillary Index of granuloma; Figures in parenthesis are in percentage

Table 2: Clinicopathological correlation among 31 patients under study

Clinical diagnosis	Histopathology of skin			
	TT	BT	BL	IL
TT-1	–	1	–	–
BT-30	1	23 (76.6)	–	6

IL, Indeterminate leprosy; Figures in parenthesis are in percentage

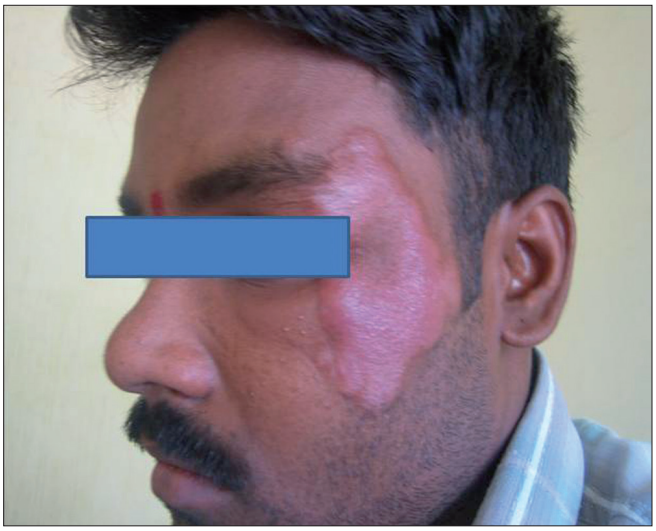

Figure 1: TT – well-defined raised erythematous lesion

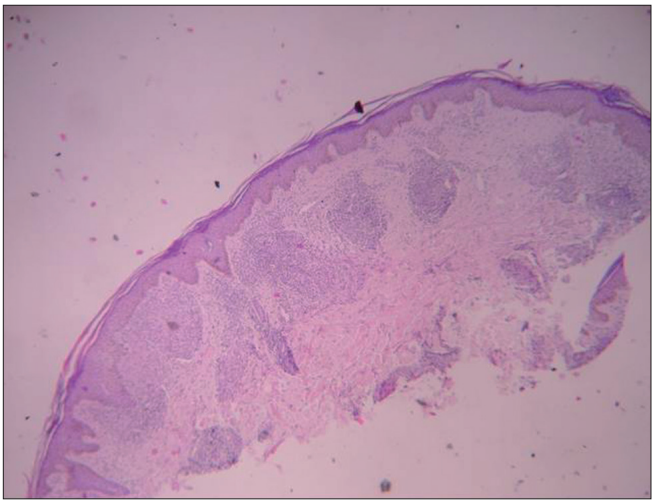

Figure 2: BT – pan dermal granuloma with langhans giant cells hugging the epidermis, H and E; 4×

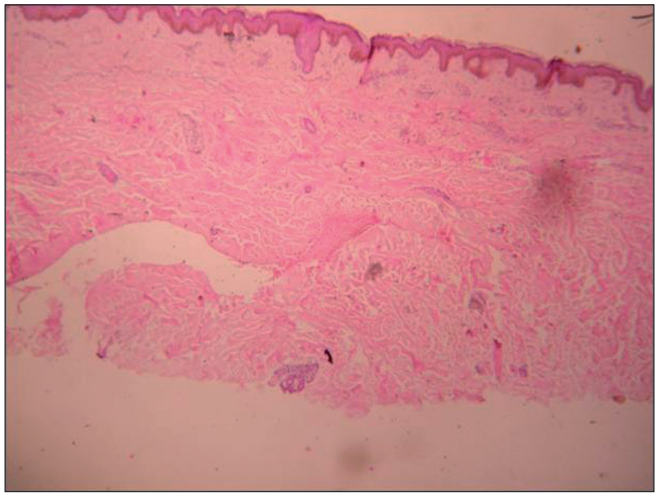

Figure 3: Initial sections – nonspecific infiltrate – H and E; 4×

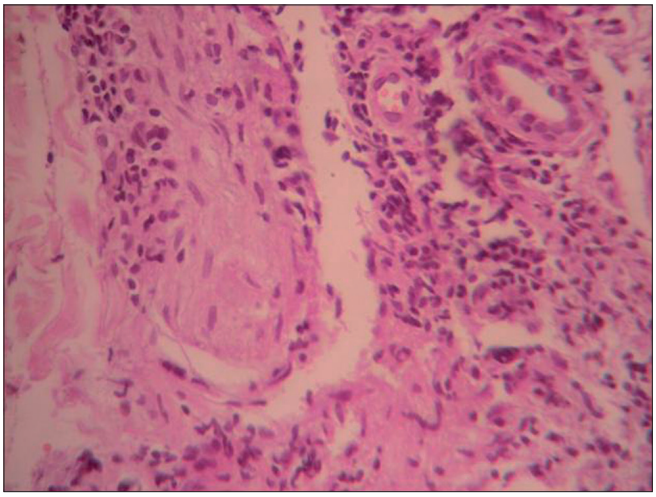

Figure 4: Deeper sections – lymphohistiocytic aggregate around nerve twigs, H and E; 40×

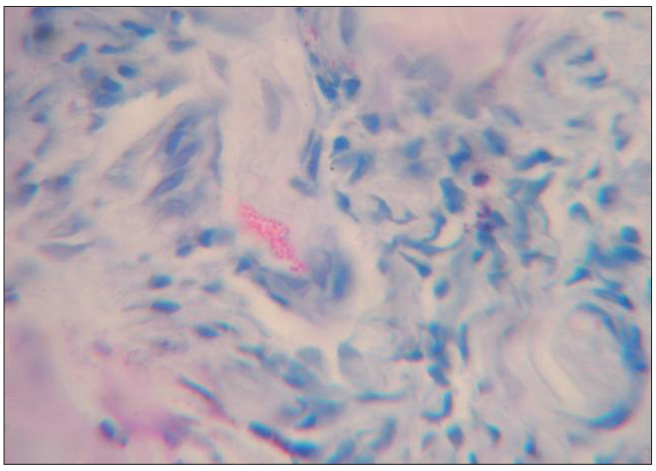

Figure 5: Fite faraco stain – AFB in nerve twig, H and E; 40×

macrophage function. Bacterial clearing capacity within a lepromin-induced granuloma is not invariably present in all tuberculoid and indeterminate leprosy patients.[9]

This study thus makes it mandatory to study tissue biopsy findings in all leprosy patients which were not considered relevant for treatment purposes until now, and thus could be given a status in the categorization and assessment of severity of the disease. The significance of the finding of AFB (1+ or more) and histopathology of MB type of leprosy in tissue biopsies, in patients grouped as PB leprosy should be resolved so that these patients could be given the drug therapy and duration of therapy they warrant.[10]

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How to cite this article: Veena S, Kumar P, Shashikala P, Gurubasavaraj H, Chandrasekhar HR, M. Significance of histopathology in leprosy patients with 1-5 skin lesions with relevance to therapy. J Lab Physicians 2011;3:21-4.

Source of Support: Nil. **Conflict of Interest:** None declared.

FORM IV

Statement about ownership and other particulars about newspaper ***(Journal of Laboratory Physicians)*** *to be published in the first issue every year after the last day of February*

1.	Place of publication	:	Mumbai
2.	Periodicity of its publication	:	Semiannual (January and July)
3.	Printer's Name	:	Medknow Publications & Media Pvt. Ltd.
	Nationality	:	Indian
	Address	:	B5-12, Kanara Business Center, Off Link Rd, Ghatkopar (E), Mumbai - 400075, India Phone: 91-22-6649 1818
4.	Publisher's Name	:	Dr. D. K. Sahu For Medknow Publications & Media Pvt. Ltd.
	Nationality	:	Indian
	Address	:	B5-12, Kanara Business Center, Off Link Rd, Ghatkopar (E), Mumbai - 400075, India Phone: 91-22-6649 1818
5.	Editor's Name	:	Dr. Sarman Singh
	Nationality	:	Indian
	Address	:	Department of Laboratory Medicine, Head, Division of Clinical Microbiology All India Institute of Medical Sciences P.O. Box. 4938, New Delhi-110 029, India
6.	Names and addresses of individuals who own the newspaper and partners or shareholders holding More than one per cent of the total capital.	:	Indian Association of Laboratory Physicians

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