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Original Research Article

Histomorphological Findings of Skin Lesions in Leprosy - A Comparative Study between Pretreatment and After Fixed Duration of Treatment

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Abstract

Background: Leprosy, a public health problem often heals after completion of WHO recommended multi-drug therapy for a fixed duration. Irrespective of the complete therapy residual lesions are still there and which made patients not satisfied. A repeat biopsy and re-treatment may be advised. So this study was undertaken to compare the histomorphological features of paucibacillary leprosy before and after MDT for a period of two years from November 2018 to October 2020.

Aims and Objectives: To study and compare the histopathological features of skin lesions of leprosy before and after fixed duration of treatment.

Materials and Methods: This prospective study was conducted at department of pathology in SCB MCH Cuttack.

Duration of study was from Nov 2018 to October 2020 on 60 cases. Pure neuritic cases were excluded from the study.

Observation: Total number of cases included in the study is sixty for a period from November 2018 to October 2020. Patients with clinical features of macule, papule, nodule were underwent biopsy and H&E staining and followed up on treatment and again biopsied and different histomorphological features were observed.

Conclusion: Awareness of histomorphological changes that occur in skin lesions of leprosy after completion of treatment can aid the pathologists to determine whether the lesions are active or inactive histologically and assist the clinician towards patient care.

Keywords: Leprosy, Fixed duration treatment, Lesion, Histomorphological changes.

Introduction

Leprosy mostly affects the skin and peripheral nerves.[1] The clinical manifestations are varied ranging from insignificant skin lesions to extensive disease-causing profound deformities [2] Depending upon the immune status of the host, leprosy presents as various clinicopathological forms. Leprosy diagnosed by various methods includes clinical examination, demonstration of AFB (Acid fast Bacilli) in slit skin smears by Ziehl Nielsen staining and histopathological evaluation. Multi drug treatment as per WHO guidelines has achieved elimination of leprosy and the focus has now shifted to handling the challenges after treatment. Effective management of relapse in treated patients is an important step in consolidating the gains achieved by fixed duration of treatment (FDT) [3]. Occasionaly it becomes very difficult to distinguish relapse from late lepra reactions (lepra reactions occurring after completion of FDT).

It has been documented that leprosy lesions show an increase epidermal basement membrane pigmentation and morphea like changes in the dermis (sclerotic dermis with paucity of adnexal structures and inflammatory infiltrate) [4]. Histological features of treated leprosy lesions may enable us to understand more about the complex immunological changes in leprosy. So we considered it worthwhile to study the histopathological findings at the end of FDT for PB, Smear negative and smear positive MB leprosy and compared with the pretreatment biopsy report [5].

Materials and Methods

This prospective study was conducted at department of pathology in SCB MCH Cuttack. The skin biopsies obtained from clinically diagnosed patients as leprosy who attended skin OPD (Pretreatment cases). Again skin biopsy was taken after 3 months and 6 months (Post treatment cases). Duration of study was from Nov 2018 to October 2020. Pure neuritic cases were excluded from the study.

Skin changes like macules, papules, nodules, patches, erythema and induration of lesions were taken up into consideration and skin biopsies for histomorphologic features were obtained by sterilized disposable skin punch biopsy and after processing, slides stained in H & E were reported. Sections were also stained by ZN Stain and were observed under oil immersion objectives for assessing the bacillary index whenever necessary. H & E sections were studied to observe the various changes that occurred in the epidermis, papillary dermis, reticular dermis, deep dermis, neurovascular bundles and adnexa. Clinicopathological correlation was done wherever required. A total of 60 patients were included in the study. 20 patients turned up for follow up and evaluation. 1st follow up was done after 3 months and 2nd follow up was done at 6 months after commencement of treatment.

Results

Total number of cases included in the study for a period from November 2018 to October 2020 was sixty (60). All diagnosed cases of leprosy were biopsied by the dermatologist. Tissue samples were sent in 10% formalin to Department of Pathology for Histopathological examination. After processing tissue sections were routinely

stained by H & E stain and ZN stain wherever required. Among the various clinical types of leprosy the most frequently encountered type was BT (Borderline Tuberculoid) 50%, followed by lepromatous leprosy, 35%.

On clinical examination majority of patients had patches (36.7%) and 33.3% of patients had nodules. About 13.3% had macules and patches, 10% had plaques and 3.3% had macules and nodules.

On histopathological examination the degree or extent of lymphohistiocytic infiltrate in the dermis was recorded and classified as normal (no infiltration), mild, moderate, diffuse and local infiltration. During follow up, significant reduction of lymphohistiocytic infiltration was noted especially after 2nd follow up.

Presence of granuloma is traditionally considered an important component of the histopathological picture of PB -leprosy. However, in our study only 40% of patients showed a granuloma in baseline histology (Fig-1). After treatment 30% showed granuloma after 1st follow up(Fig-2) and 20% showed granuloma after 2nd follow up. Finally, the histopathological changes between pretreatment and post-treatment follow-up were compared with P value and was found to be significant in loose granuloma, lymphocytes predominant granuloma and vacuolar changes in epithelioid cell cytoplasm. (Fig -3).

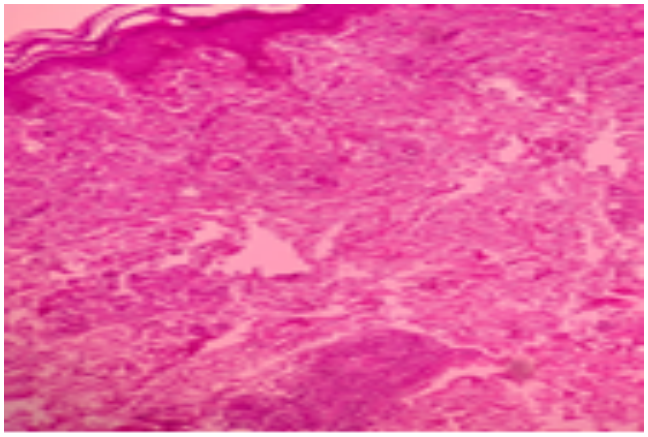

Figure 1: Pretreatment Case showing presence of Granuloma (H &E x10)

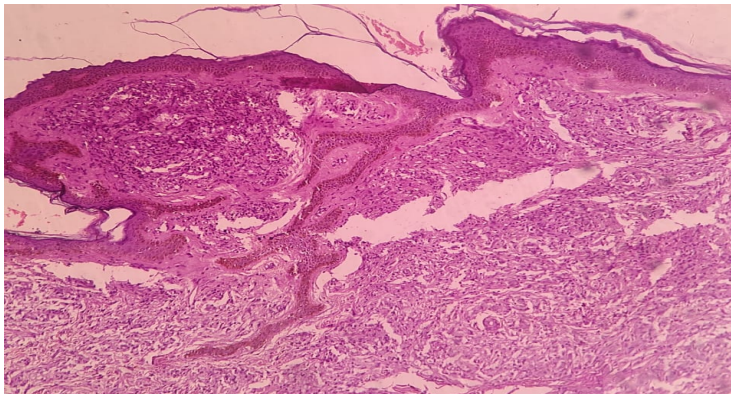

Figure 2: Post treatment Ist follow up (H&E x 10)

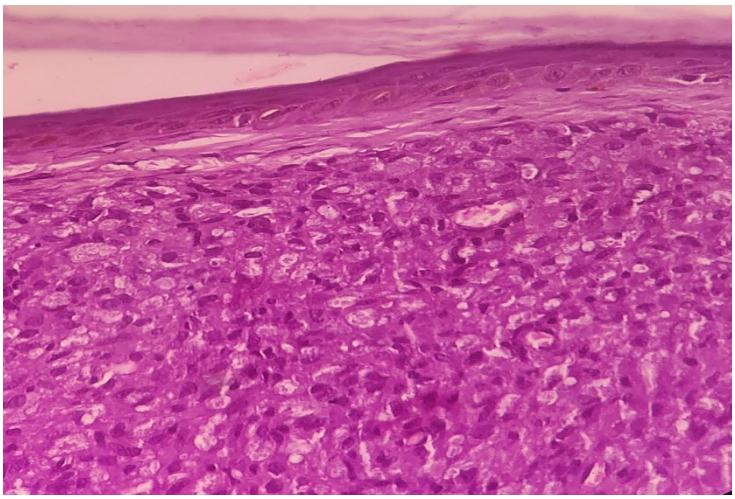

Figure 3: Post treatment changes (H& E x 40)

Discussion

Leprosy caused by mycobacterium leprae affecting the skin and peripheral nerves often heals with residual lesions even after completion of treatment. It's still continuing to be an important public health problem. In the present study more number of patients were in the age group of 41-60 years (45%) with a slight male predominance (69%). Most patients (71.66%) were from low socioeconomic status [6]. Maximum number of cases among those clinically diagnosed belonged to BT (50%) followed by LL (35%), BL (10%) and TT (5%). This correlates well with other studies like Nitesh Mohan *et al* and Jindal *et al*. On histopathological examination 53.3% constituted BT, followed by 33.3% LL, 8.3% BB and least one TT 5%. This corelates well with studies by Mohan N *et al* and Manandhar *et al* [7]. A large number of treated patients have persistent lesions at completion of therapy [8] studies suggest that in most patients with active lesions at completion of therapy, improvement occurs with time due to ongoing resolution process, while a few lesions may remain active. The is attributed to failure on treatment, relapse ormay be late reactions. In paucibacillary leprosy cases resolution, relapse and delayed reaction are very difficult to distinguish among them.[9]

This study is in agreement with others which concluded that histological regression is delayed as compared to clinical resolution [10]. The highly variable disease spectrum and slow resolution even in the absence of active bacterial multiplication suggests that the disease is induced and maintained by mycobacterium leprae antigenic determinants and host immune response. Loosening of a granuloma, an absolute decrease in number of epithelioid cells and vacuolization of epithelioid cell cytoplasm were significant changes consistently seen in post-treatment cases. It is regression of granuloma. With therapy there is decreased antigenic stimulus and hence granuloma formation recedes. On therapy it can lead to immune activation and change in granuloma formation as early as two weeks. Foamy changes in the epithelioid cell cytoplasm can be confused with foamy change of histiocytes and downgrading towards multibacillary spectrum. Observation bias may be there.

Conclusions

Awareness of histomorphological changes

which are seen in skin lesions of leprosy like loose granulomas, predominance of lymphocytes and vacuolar changes in the cytoplasm of epitheliod histiocytes mostly seen in post-treatment than pretreatment cases. One should aware that histological resolutions are always slower and delayed as compared to clinical resolution. So when it is observed that there is clinical inactivity, correlate with histomorphological changes and it gives the clinician a suggestion to terminate the therapy.

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