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HISTOPATHOLOGICAL EVALUATION OF WHO CLASSIFIED MULTIBACILLARY LEPROSY CASES IN A TERTIARY CARE CENTRE, SOUTH KERALA

Dermatology

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ABSTRACT

There are significant differences in the histopathology of leprosy lesions which is influenced by the host immune response to Mycobacterium leprae. **Objective -** To find the histopathological changes in newly diagnosed multibacillary leprosy(MB) cases registered in the skin department Government Medical College, Thiruvananthapuram. **Method-** skin biopsy performed in 40 multibacillary leprosy cases and histopathological findings were evaluated. **Results-** 70% showed epidermal atrophy. Granulomas, composed of sheets of foamy macrophages, lymphocytes and epithelioid cells, were seen in 21 cases & twenty two cases were AFB positive. Eight cases each were lepromatous, borderline tuberculoid, mid boderline, borderline lepromatous types. **Conclusion-** Presence of 60% cases of borderline leprosy indicates the unstable immune response in leprosy patients. Majority were either borderline lepromatous or lepromatous showing the infective nature of multibacillary leprosy**.** Histopathological examination with Fite- Foroco staining is a crucial method and the gold standard for accurate diagnosis and typing of leprosy.

KEYWORDS

multi bacillary, histopathology, granuloma, leprosy

INTRODUCTION

Leprosy is a chronic disease caused by Mycobacterium leprae, infectious in some cases, and affecting the peripheral nervous system, the skin and certain other tissues[1]. A person is diagnosed to have leprosy if any of the cardinal features of leprosy, asymptomatic *asymptomatic hypopigmented or erythematous skin lesion with loss of sensation or thickened peripheral nerve with sensory impairment in the area supplied by the nerve or skin smear examination positive for acid fast bacilli are present.*[2].

The diagnosis and classification of leprosy have traditionally been based on the clinical examination, frequently with additional information from skin smears and histopathological examination[3]

The clinical system of classification for the purpose of treatment by World HealthOrganisation (WHO) includes multibacillary(**MB**) and paucibacillary (**PB**) leprosy. PB leprosy comprises cases with 1 to 5 skin lesions, single nerve trunk involvement, and AFB negativity. MB leprosy includes cases with more than 5 skin lesions, two or more nerve trunk involvement, and AFB positive cases.[4,5].

Ridley and Jopling classified leprosy into five types, namely Tuberculoid (TT), Borderline tuberculoid (BT), Borderline borderline (BB), Borderline lepromatous (BL) and Lepromatous (LL) correlating clinical, bacteriological, histopathological and immunological findings[6]. Histopathological examination of skin lesions is a crucial method and the gold standard for accurate diagnosis and typing of leprosy[7,8]. The spectral concept of leprosy evolved in part from the study of the pathology of leprosy lesions[6].

This study aimed to find out the histopathological findings in untreated multibacillary leprosy cases registered in a tertiary care centre in Thiruvananthapuram, Kerala , India

Study design- descriptive cross sectional study

The study was conducted in the Department of Dermatology and Venereology, Government Medical College, Thiruvananthapuram for a period of 1 year from September2003 to August2004 after receiving clearance from the Institutional Ethical Committee.

Inclusion criteria- All newly diagnosed multibacillary leprosy patients in the Department of Dermatology during that period.

Exclusion criteria- Patients with previous history of anti leprosy treatment ,Children below 12 years, pure neuritic cases and relapse cases were excluded.

Methodology

Consent from the patient was taken before including in the study. A detailed history & a dermatological were done in all cases. Earlobe smear and slit skin smears from two lesional sites and one from apparently normal looking skin were taken and the bacteriological and morphological indices were recorded. Skin biopsies were performed in all the cases from a representative skin lesion under local anesthesia and sent for histopathological examination, after taking consent from patient. Skin biopsy specimens were fixed in 10% formalin. After adequate fixation for about 8-12 hours, the biopsies were routinely processed and multiple sections were taken. The sections were stained with Hematoxylin and Eosin for morphological analysis and special stain for Acid fast bacillae(AFB) with Fite - Foroco [9].

Epidermal changes looked were Atrophy/ erosion/ Hyperkeratosis/ Parakeratosis and Dermal changes noted were-presence or absence of Grenz zone, inflammatory infiltrate,Type &location of infiltrate as Focal / Periadnexeal ,type & Composition of granuloma &Presence of Acid fast bacilli.

Depending on these, and AFB staining characteristics, a histopathological spectral typing was done. In this study, the classification proposed by Ridley and Jopling (1966) as well as the IAL(1981) classification were combined and adopted subdividing leprosy into the following types[6].

- Tuberculoid leprosy (TT)
- Borderline tuberculoid leprosy(BT)
- Mid Borderline leprosy(BB)
- Borderline lepromatous leprosy(BL)
- Lepromatous leprosy(LL)
- Indeterminate (HD-I)

Descriptive statistics were produced for demographic, clinical, and laboratory characteristics for this study sample of patients.

Quantitative variablesand qualitative variables were analysed and summarized as counts and percentages. Data analysis was performed using Microsoft Excel.

RESULTS

Most common epidermal change noted was atrophy{FIGURE 1}, which was noted in 28 patients (70%).

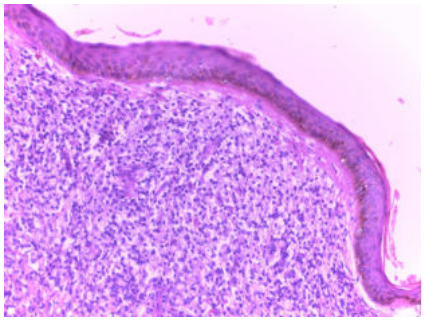

FIGURE 1. Hansens Disease- Lepromatous leprosy. H & E section showing atrophy of epidermis, subepidermal grenz zone and diffuse histioplasmacytic infiltrate in the dermis in low power view-

Hyperkeratosis &acanthosis were seen in (22.50%) and four (10%) patients respectively. Erosion of epidermis and parakeratosis were seen (2.5% each).Grenz zone was noticed in 20 patients (50%){FIGURE 1}). Dermal inflammatory cell infiltrate other than granulomas was noted in eight patients (20%).Periadnexeal inflammatory infiltrate was present in 18 cases (45%) and nine cases showed perineural infiltrate (22.50%) {FIGURE 2}

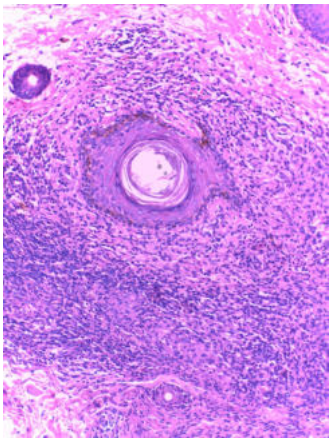

FIGURE2 . Hansens Disease- BT. H & E section showing peri appendageal granuloma

Well formed granulomas composed of epithelioid cells, Langhan's giant cells and lymphocytes were seen in 9 patients (22.50%){FIGURE 2,}. Regarding location of granuloma (2.50%) it was hugging the epidermis, (10%) cases it occupied the papillary dermis alone and in five cases it was present in the papillary as well as reticular dermis (10%). Granulomas, composed of sheets of foamy macrophages, a few lymphocytes and epithelioid cells seen (52.5%).The granuloma extended from beneath a well formed grenz zone to papillary as well as reticular dermis (37.5%) and up to middle of reticular dermis (15%).{FIGURE 1}.

Five to six serial sections were taken and stained for acid-fast bacilli by modified Fite Faraco method. Twenty two cases (55%) were found to be positive for AFB. They were seen as single scattered rods and also as clumps inside the macrophages. Foamy macrophages were seen in sheets in 10 cases (25%){FIGURE 3}.

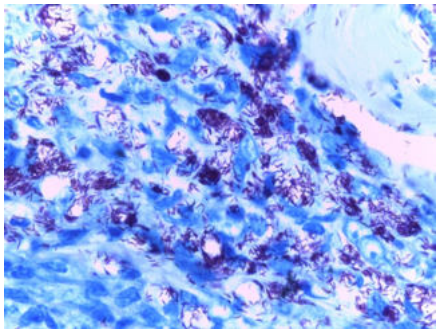

FIGURE 3. Hansens Disease- Lepromatous leprosy- Wade fite staining showing lepra bacilli as globi and single rod shaped bacilli.

Dermal oedema was noted in two patients (5%) , an evidence of type 1 lepra reaction. None of the cases showed evidence of type 2 lepra reaction

- Depending on the epidermal , dermal changes , AFB staining characteristics, type and pattern of granuloma a histopathological diagnosis was made and BT, BB, BL, LL constituted 20% each, followed by indeterminate leprosy 17.5%{FIGURE 4}.Only one case had a histopathological diagnosis of TT (2.5%)(Chart 1). Histopathological evidence of HD(I) lepra reaction was noticed in two patients (5%).

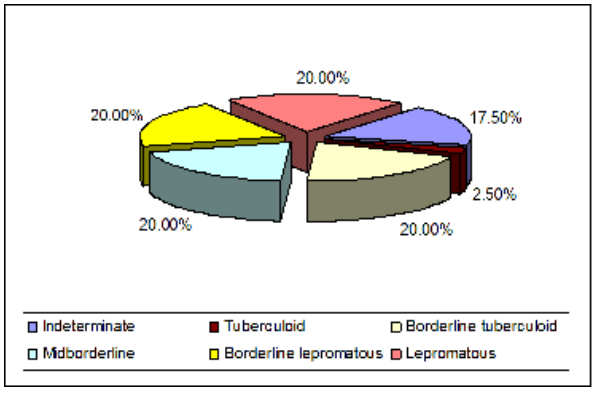

Chart 1. Histopathological Spectrum

DISCUSSION

Of 40 new MB cases epidermal atrophy seen in 28 patients(70%) is higher than the study done by Ravindranath S ,which showed epidermal hypertrophy in 55.55%cases [10] . Hyperkeratosis and acanthosis were seen in (22.50%) & (10%)cases in our study respectively & is in accordance to previous few studies [11,12,13]

One case was tuberculoid tuberculoid(TT) leprosy in our study& the higher spectrum may be because of wrong selection of representative skin lesion for biopsy [14,15].

5% showed features of type 1 lepra reaction which can be a presenting symptom of borderline leprosy in the form of dermal oedema and increased lymphocytes[1416.]. Periadnexeal lymphocytic infiltrate and poorly organized granulomas composed of foam cells, epithelioid cells and lymphocytes dermis seen in(20%).Eight cases(20%) were diagnosed as BL seeing grenz zone, diffuse mononuclear cells and foam cells and the AFB.Massive epidermal atrophy, flattening of rete ridges, well formed grenz zone, sheets of foamy macrophages in the papillary and reticular dermis and AFB in clumps and globi were seen in LL(20%) which is similar to that reported in literature.

In our study 20 % each belonged to BT, BB, BL ,LL &17.5% were HD(I) while only 2.5% showed changes of TT which is lesser than the previous studies.This may be because of the inclusion of WHO operational classified multibacillary cases alone in our study. Maximum numbers of cases in most of the previous studies were of BT [17-19.]

Thapa et al found the most common types to be both TT and BT (12 cases each) in their study[20]. Pokhrel et al found BT to be the least common (1 case) and TT to be the most common (14 cases) type[21].Majority of patients(60%) showed changes of borderline spectrum(BT,BB,BL).Many patients exhibit a continuous shift over the immunological spectrum with progression of the disease& this could be the reason for the majority of patients were found to be of borderline type .Khamankar et al found LL to be the commonest histological type followed by BL. TT was the second commonest type in their study[22].All these studies included all the leprosy cases while our study included only multi bacillary cases.

CONCLUSION

Skin Biopsy is a minimally invasive, easy method and is needed in cases where insufficient clinical history is available and in non anaesthetic facial lesions.. There is considerable overlap between different types of leprosy so biopsies should be taken from representative lesions in all cases

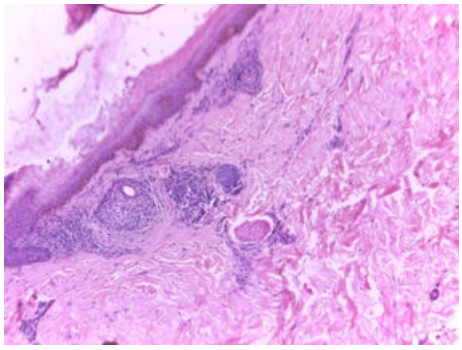

FIGURE 4. Hansens Disease- ***Indeterminate Leprosy -H and E section showing up warding curvilinear infiltrate round the appendages and the around the*** **arrector pili .**

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