

## The Creeping Metamorphosis of Leprosy with Histopathological And Clinicopathological Study in Alliance of Bacteriomorphological Index



### Medical Science

**KEYWORDS :** LEPROSY CLINICAL HISTOPATH BACTERIOMORPHOLOGICAL INDEX

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### ABSTRACT

*Hansen's disease commonly known as leprosy is a chronic infectious disease commonly affecting the peripheral nerves.leprosy involving primarily the skin, peripheral nerves and nasal mucosa and if not diagnosed & treated early causes deformities in eyes, hands & feet. The bacteriological examination in leprosy is an effective tool to diagnose the cases and their consequences, monitoring their prognosis and identifying possible cases of relapse for further investigations.Mycobacterium leprae is the causative agent. Demonstration of leprosy is based on different clinical parameters.this study was done to study histologically various skin biopsies suspicious of leprosy and correlate this evaluation with bacteriological index and morphological index. Leprosy can be classified into 5 different types.This is a 2 year study from may 2012 to may 2014.The sample size was 24 cases.*

### INTRODUCTION:

Leprosy is an impertinent disease in India which holds good antiquity <sup>1</sup>. Literature on Leprosy giving a fairly accurate clinical description and classification of the disease could be traced to the ancient Indian medical literature dating back to 500 BC, by Charaka, Sushruta & Vagabhatta. Leprosy also patented as Hansen's disease, is a chronic, infectious disease that primarily affects the skin in algorithm with peripheral nerves <sup>2</sup>. It is an endemic <sup>3</sup> as its elimination is not as straightforward caused by Obligate intracellular Gram positive and acid fast bacilli which is Short, thick, pink stained rods arranged in Single or in cigar-shaped bundles or in "globi" <sup>4</sup> Affinity for Schwann cells & cells of R-E system Cannot grow in vitro but can grow in mice and nine banded armadillos.

### LITERATURE SURVEY:

Leprosy is symbolized by different clinico-pathological forms depending on the immune status of the host <sup>5,6</sup>. Diagnosis of leprosy is based on different clinical parameters which involves detailed examination of skin lesions and peripheral nerves <sup>7</sup>. Demonstration of acid-fast bacilli in slit skin smears by Ziehl-Neelsen's staining succors in the diagnosis of leprosy <sup>8</sup>. Ridley and Jopling were the first to suggest a subdivision of leprosy on an immunological basis into five types; tuberculoid (TT), borderline tuberculoid (BT), mid borderline (BB), borderline lepromatous (BL) & lepromatous (LL) <sup>9</sup>.

### MATERIALS AND METHODS:

24 Skin smear samples of patients were collected . Skin smears were taken from the ear-lobes, both the sides of the forehead,hypopigmented patches and from the apparently normal skin also during the initial examination to confirm the type of lesion. The smears were stained by Ziehl -Neelsen staining method <sup>10</sup> and for bacteriological reading and gradation of smears, Ridley's scale <sup>11</sup> was used.For histopathological correlation slides were stained with Hematoxylin and Eosin.Fite stain used as per the requirement.

**RESULTS :** Total 24 cases were diagnosed as leprosy which had a previous clinical suspicion of leprosy for that particular age group and skin smears were studied to grade them for bacteriological and morphological index. Out of 24 cases 8 cases were between the age group of 20-24 years out of which 50% (4/8) cases were of IL,25%(2/8) cases were of TT,12.5% cases of BL,12.5% were of ENL type. No cases of BT, BB and LL seen in this age group.4 cases were seen in the age group of 25-29 years , where maximum 60 % of patients had IL type followed by TT,ENL and LL. No case of BB AND BT seen in this agegroup.3 cases were

between the age group of 30-34 years out of which 70% were IL, followed by ENL,TT and BT with the absence of BB,BL,LL in this group.5 cases were in the age group of 35-39 years out of which majority had 64 % had IL with the absence of BB,ENL,BL,LL type.4 cases were falling in the age group of 40 years and above with majority 60% having TT . In Present study Skin smears samples taken from different sites were stained by Ziehl -Neelsen staining method and examined using Ridley's scale for bacteriological reading and gradation of smears.<sup>10,11</sup> 25 % cases were positive, out of these positive cases 35 % have a BI of over 3+ , while the remaining 75% cases have completed varying periods of treatment and showing distinct improvement in their BI. This shows that Bacteriological examination is a useful investigative tool to support the clinical diagnosis of leprosy. Morphological index was positive only in 29.1% of the patients whereas 70.8% were negative. Majority of the patients had indeterminate/early form of leprosy Following are the tables for the results that were

### obtained:

**TABLE 1:**  
**CASE DISTRIBUTION DEPENDING ON SEX**

| SEX    | NO. | PERCENTAGE |
|--------|-----|------------|
| FEMALE | 09  | 37%        |
| MALE   | 15  | 62.5%      |
| TOTAL  | 24  | 100%       |

Out of 24cases 37.5 % were females and 62.5 % were males.

**TABLE 2: CASES DISTRIBUTION ACCORDING TO HYPOPIGMENTED PATCHES**

| HYPOPIGMENTED PATCHES | NO. | PERCENTAGE |
|-----------------------|-----|------------|
| PRESENT               | 10  | 41.66%     |
| ABSENT                | 14  | 58.33%     |
| TOTAL                 | 24  | 100%       |

**Out of 24 patient 41.66% presented with hypopigmented patches**

**TABLE 3: DISTRIBUTION OF CASES ACCORDING TO PRESENCE OR ABSENCE OF ITCHING**

| ITCHING | NO | PERCENTAGE |
|---------|----|------------|
| PRESENT | 09 | 37.5       |
| ABSENT  | 15 | 62.5%      |
| TOTAL   | 24 | 100%       |

**Out of 24 cases Only 37.5 % had itching as a clinical presentation.**

**TABLE 4: DISTRIBUTION OF CASES DEPENDING ON PRESENCE OR ABSENCE OF PALPABLE NERVES**

| PALPABLE NERVES | NO. | PERCENTAGE |
|-----------------|-----|------------|
| PRESENT         | 6   | 25%        |
| ABSENT          | 18  | 75%        |
| TOTAL           | 24  | 100%       |

Palpable nerves were seen in 25 % of the patients and absent in 75% of patients.

**TABLE 5: DISTRIBUTION OF CASES ON THE BASIS OF PRESENCE OR ABSENCE OF TINGLING NUMBNESS , LOSS OF SENSATIONS AND DEFORMITY**

| NO.     | T I N G L I N G NUMBNESS | LOSS OF SENSATION | OF DEFORMITY |
|---------|--------------------------|-------------------|--------------|
| PRESENT | 06(25%)                  | 10(41.6%)         | 2(08%)       |
| ABSENT  | 18(75%)                  | 14(58.3%)         | 22(91.6%)    |
| TOTAL   | 24                       | 24                | 24           |

Out of 24 cases examined 25% had tingling numbness,41.6% had loss of sensations and 08% suffered from deformities.

**TABLE6: DISTRIBUTION OF CASES BASED ON DIAGNOSIS:**

| DIAGNOSIS | NO. | PERCENTAGE |
|-----------|-----|------------|
| TT        | 05  | 20.8%      |
| BT        | 01  | 4.6%       |
| BB        | 1   | 4.6%       |
| IL        | 11  | 45.8%      |
| ENL       | 3   | 12.5%      |
| BL        | 2   | 8.3%       |
| LL        | 1   | 4.6%       |
| TOTAL     | 24  | 100%       |

Out of the total 24 cases 20.8 % were diagnosed as TT,4.6% as BT,4.6% as BB,45.8% as IL,12 .5% as ENL,8.3% as BL and 4.6% LL

**TABLE 7:DISTRIBUTION OF CASES DEPENDING ON BACTERIOLOGICAL INDEX**

| BACTERIOLOGICAL INDEX | NO. | PERCENTAGE |
|-----------------------|-----|------------|
| POSITIVE              | 06  | 25%        |
| NEGATIVE              | 18  | 75%        |
| TOTAL                 | 24  | 100%       |

Bacteriological index was positive in 25% out of all the 24 cases.

|                          | Tuberculoid   | Borderline Tuberculoid   | Borderline Lepromatous                    | Borderline   | Lepromatous  |
|--------------------------|---|--|---|--|--|
| Skin                     |   |  |   |  |  |
| Infiltrated lesions      | Defined plaques, irregular plaques, healing centers | Polymorphic, partially raised edges, satellites                      | Papules, nodules, punched-out centers     | Diffuse thickening   | Diffuse thickening                                 |
| Macular lesions          | Single, small                                       | Several, any size  | Multiple, all sizes, bizarre              | Innumerable, small   | Innumerable, confluent                             |
| Peripheral Nerve lesions | Solitary, enlarged nerves                           | Irregular enlargement of several large nerves, asymmetrical patterns | Many nerves involved symmetrical patterns | Late neural thickening, asymmetrical anaesthesia and paresis | Slow, symmetrical 'glove-and-stocking' anaesthesia |

**TABLE 8: DISTRIBUTION OF CASES ACCORDING TO MORPHOLOGICAL INDEX**

| MORPHOLOGICAL INDEX | NO. | PERCENTAGE |
|---------------------|-----|------------|
| POSITIVE            | 07  | 29.1%      |
| NEGATIVE            | 17  | 70.8%      |
| TOTAL               | 24  | 100%       |

Out of 24 cases 07(29.1%) were positive for morphological index.

**DISCUSSION:** Diagnosis of Leprosy is mostly based on clinical findings.According to Ridley and Jopling Leprosy can be categorized into Tuberculoid (TT),Borderline Tuberculoid (BT),Borderline Borderline (BB) ,Borderline Lepromatous (BL) , Lepromatous (LL)Indeterminate leprosy .12However, clinical diagnosis of early lepromatous cases having only smooth, oily shiny skin without any clinical signs of leprosy is very difficult unless supported by positive bacteriological findings. 14Similarly, the diagnosis of BL & BB cases also needs to be confirmed by positive skin smears. These are the real cases of consequence for spread of infection in the community and their diagnosis is confirmed by bacteriological examination.13 The Cardinal signs of Leprosy are, Patch or Patches on skin with anaesthesia, thickened and tender peripheral nerve trunks with sensory /motor impairments in the areas supplied, presence of *Mycobacterium leprae* in slit skin smears (SSS).13,14,15The bacteriological index (BI) is an expression of the extent of bacterial loads. It is calculated by counting six to eight stained smears under the 100 x oil immersion lens. in a smear made by nicking the skin with a sharp scalpel and scraping it; 1+ At least 1 bacillus in every 100 fields., 2+ At least 1 bacillus in every 10 field, 3+ At least 1 bacillus in every field, 4+ At least 10 bacilli in every field,5+ At least 100 bacilli in every field ,6+ At least 1000 bacilli in every field. Number of Bacilli seen in each field is recorded as Bacillary index 16 and Indicates the Prognosis of the Disease.The Morphological index (MI) is calculated by counting the numbers of solid-staining acid-fast rods .18 Only the solid-staining bacilli are viable. It is not unusual for solid-staining M. leprae to reappear for short periods in patients being successfully treated with drugs. It is important to recognize that measurement of MI is liable for observer variation.The fluid and tissue obtained are spread fairly thickly on a slide and stained by the Ziehl-Neelsen method and decolorized (but not completely) which 1% acid alcohol. 19

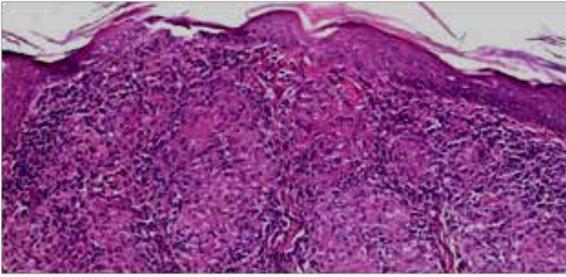


FIG -1: TT-NON NECROTIZING GRANULOMAS WITH GIANT CELLS WITH LANGHANS TYPE GIANT CELLS

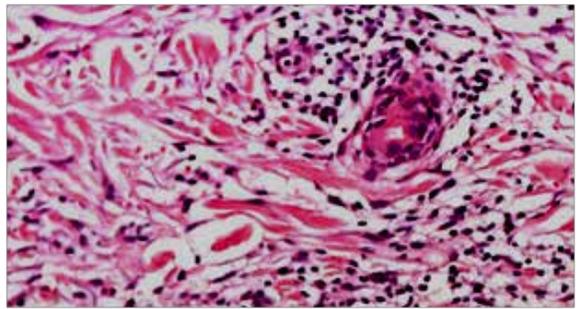


FIG -6: IL- PERIVASCULAR ,PERINEURAL,DEEP AND SUPERFICIAL ADNEXAL LYMPHOCYTIC INFILTRATE

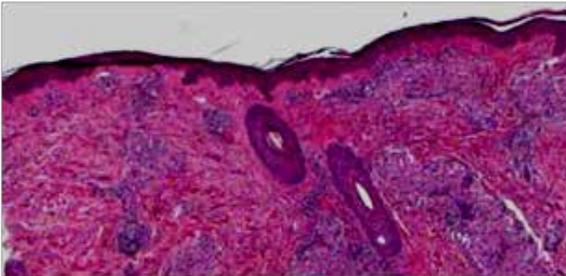


FIG -2: BT-EPITHELIOID GRANULO MAS WITH GRENZ ZONE PRESENT

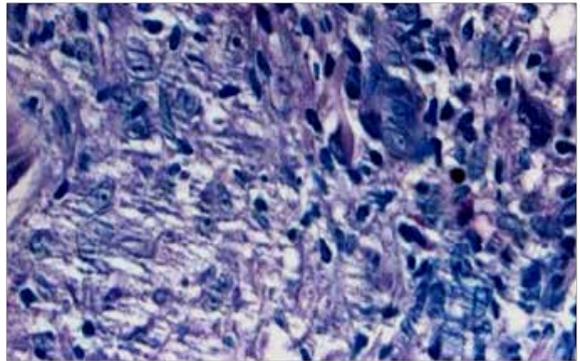


FIG7-BACTERIAL INDEX -0

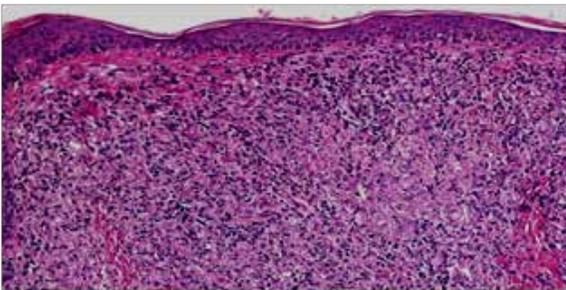


FIG -3: BB -GRANULOMAS INDISTINCT WITH GRENZ ZONE PRESENT

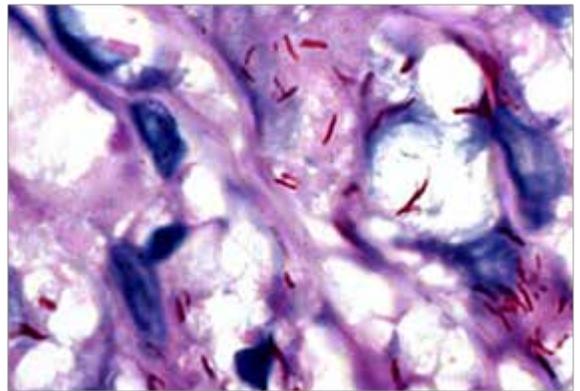


FIG7-BACTERIAL INDEX -5-6

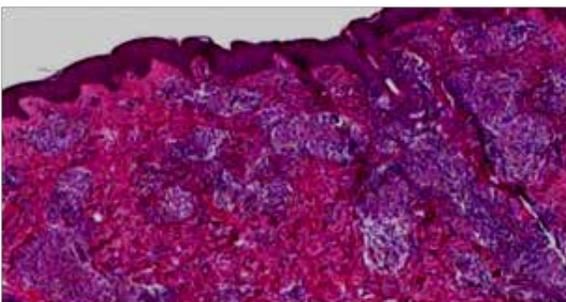


FIG -4: BL- POORLY FORMED GRANULOMAS WITH LYMPHOCYTES PRESENT

**Conclusions**

By bacteriological and morphological index and histopathological examination, the diagnosis of early lepromatous cases/Indeterminate leprosy can be confirmed . The present study was carried out with objectives to explain the role of bacteriological , morphological and histopathological examination in diagnosis of certain types of leprosy , to emphasize the importance of bacteriological examination in research studies on relapse trends among cases with high bacteriological loads before end of treatment.

**FUTURE SCOPE**

The above knowledge on the various forms and indices will help to completely eradicate this cutaneous lesion from its roots and better perspectives can be thought of for the patients.

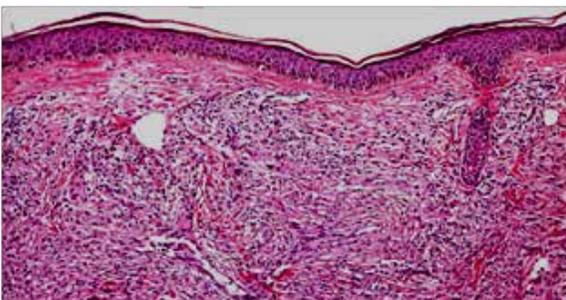


FIG 5: LL- PROMINENT GRENZ ZONE WITH DIFUSE ,NODLAR AND PATCHY INFILTRATE OF FOAMY

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