ORIGINAL RESEARCH

Evaluation of clinico histopathological spectrum of leprosy patients in a tertiary care hospital

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ABSTRACT
Background: Leprosy is a chronic infectious disease involving skin and peripheral nerves. It is present in different clinico-pathological forms depending upon immune status of the host. **Objectives:** To study the clinical and Histopathological features in patients of leprosy and to find out the correlation of clinical diagnosis and Histopathological diagnosis. **Methods:** This was a cross sectional hospital-based study. A detailed clinical history and examination were carried out. Clinical examination included the type, number and site of lesion, type of disease and neural involvement. All the patients were subjected to skin biopsies with routine Haematoxylin and Eosin stains. **Results:** A total of 80 cases clinically suspected with leprosy were studied. Majority of the patients (40%) were in the 30-45 years of age, predominantly male (63.8%). Most common site of lesion was upper extremities (33.7%) followed by head & neck (21.3%). The common clinical feature was Hypo-anesthetic patch (61.3%) and erythematous plaque (58.7%). The commonest reported histopathological type was borderline Tuberculoid (43.7%) followed by lepromatous leprosy (20%). Correlation between clinical and Histopathological diagnosis for individual type of leprosy was found to be TT (66.7%), BT (68.5%), BB (50%), BL (70%), LL (93.7%) and IL (45.5%). **Conclusion:** Diagnosing and treating leprosy solely on clinical basis still poses a problem while histopathology helps in making a definite diagnosis. This study shows a good correlation among clinical and Histopathological findings in skin biopsy

Keywords: Leprosy, Tuberculoid, Lepromatous, Borderline, Histopathology, Clinical diagnosis

INTRODUCTION
Leprosy is one of the oldest, chronic, granulomatous, infectious diseases having a prolonged incubation period that affects the skin and peripheral nerves [1]. It can also affect muscles, eye, bones, testis, & internal organs. It is caused by a slow growing mycobacterium, Mycobacterium leprae. The bacteria were discovered by Hansen in 1837. It is also known as Hansen's disease. Interestingly, the organism cannot be cultured [2]. The disease presents in various clinico-pathological forms depending on the immune status of the host. The disease spectrum has been characterised in a number of classification systems, most widely being the Ridley-Jopling classification. In this classification, leprosy has been divided into five groups as Tuberculoid (TT), Borderline tuberculoid (BT), Mid-bordrline (BB), Borderline Lepromatous (BL), and Lepromatous (LL) [3]. Since ancient times Leprosy is known as "Kushtaroga." Leprosy has been declared eliminated (prevalence rate<1/10,000. population) as an important public health problem in our country on January 1, 2006, still cases are being reported with varying prevalence throughout many areas in India [4]. India has succeeded in bringing down the prevalence rate to 0.66/10,000 in 2016, despite the above successes, the fact remains that India continues to account for 60% of new cases reportedly globally each year and is among the 22 "global priority countries" that contribute 95% of world numbers of leprosy warranting a sustained effort to bring the numbers down [5]. A reliable diagnosis hinges around a good

Histopathological diagnosis and demonstration of acid fast bacilli (AFB) in Histopathological sections [6]. Modified Fite's procedure has proved to be the most valuable in demonstrating leprae bacilli in tissues sections [7]. Due to its clinical diversity as well as its ability to mimic other diseases, leprosy is sometimes difficult to diagnose clinically, making Histopathological examination a helpful diagnostic tool to confirm the diagnosis [8]. Clinical classification gives recognition only to gross appearances of the lesions, while parameters used in Histopathological classification are precise taking into the account the progression and regression of disease under treatment [9]. Hence, Histopathological examination remains a cornerstone in the diagnosis and appropriate management of this disease.

AIMS & OBJECTIVES

The present research was taken to evaluate the clinical and Histopathological diagnosis of the tissue sections from clinically suspected patients of leprosy in this region

MATERIALS AND METHODS

This was a cross sectional observational hospital-based study was conducted in the collaboration of department of dermatology and department of pathology, in a tertiary care hospital, India. All clinically suspected patients of leprosy attending out patients department of dermatology in our hospital during the study period were enrolled in this study.

Inclusion criteria

- Patients ≥ 18 years of age with both gender
- Patients having clinically suspected leprosy
- Patients who provide written informed consent for the study

Exclusion criteria:

- Patients less than 18 years of age
- Patients already treated with anti-leprosy medications at any time earlier
- Patients who not willing for the study

A detailed socio-demographic data, clinical history and examination were carried out. Clinical examination included the type, number and site of lesion, type of disease and neural involvement.

All the patients were subjected to skin biopsies from the most active part of the lesions. Biopsies were fixed in 10% formalin & processed and stained with routine Haematoxylin and Eosin stains. Histopathological evaluation included invasion of epidermis, involvement of sub-epidermal zone, character & extent of granuloma, density of lymphocytic infiltrate, epitheloid cells and other cellular elements, nerve involvement and presence of M. leprae

On Histopathological examination leprosy was categorized according to Ridley Jopling classification into Tuberculoid (TT), Borderline Tuberculoid (BT), mid-borderline (BB), Borderline Lepromatous (BL), Lepromatous (LL), Histoid Hansens (HH) [10].

Statistical analysis

All data were analysed using SSPS version 22. Categorical data were summarized as in proportions and percentage (%) while discrete as mean ± SD. A p-value <0.05 was considered statistically significant.

RESULTS

Table 1: Socio-demographics variables of study subjects

Socio-demographic variables		Frequency (n=80)	Percentage
Age group in years	18-30	19	25%
	31-45	31	40%
	46-60	18	23.8%
	>60	7	11.2%
Gender	Male	51	63.8%
	Female	29	36.2%
Educational status	Illiterate	29	36.2%
	Primary school	27	33.8%
	Secondary school	19	23.8%
	Graduate	5	6.2%
Socio-economic status	Lower	33	41.2%
	Middle	28	35%
	Upper	19	23.8%

Figure 1: Histopathological distribution of leprosy cases

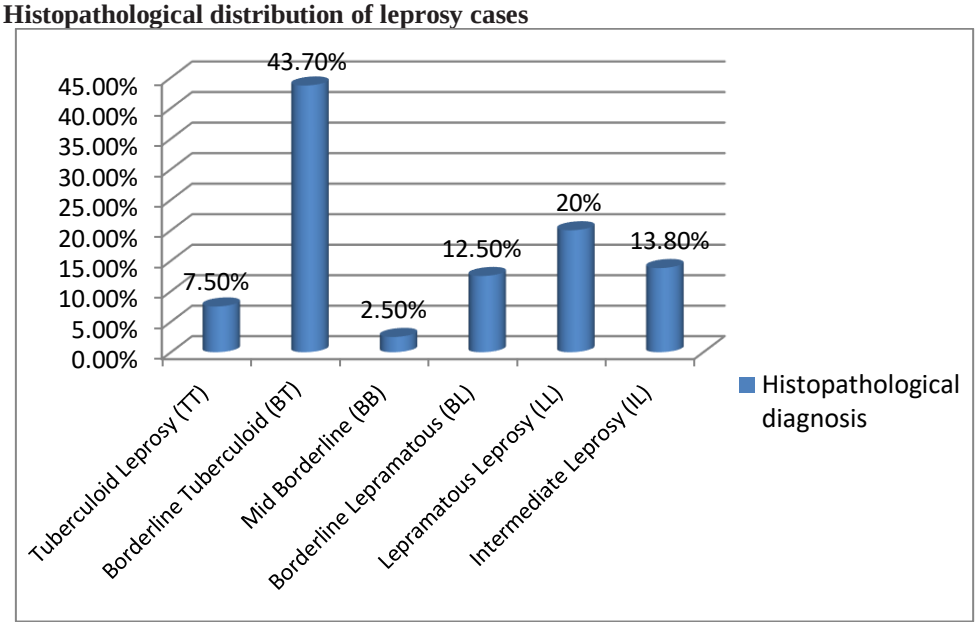

Table 2: Clinical presentation in various types of leprosy

Clinical diagnosis	Hypo-anesthetic patch	Erythematous plaque /papule/nodule	Total no of cases (%)
Tuberculoid Leprosy (TT)	2	3	5 (6.3%)
Borderline Tuberculoid (BT)	31	5	36 (45%)
Mid Borderline (BB)	1	1	2 (2.5%)
Borderline Lepromatous (BL)	5	9	14 (17.5%)
Lepromatous Leprosy (LL)	7	12	19 (23.7%)
Intermediate Leprosy (IL)	3	1	4 (5%)

Figure 2: Distribution of Site of leprosy lesions among study subjects

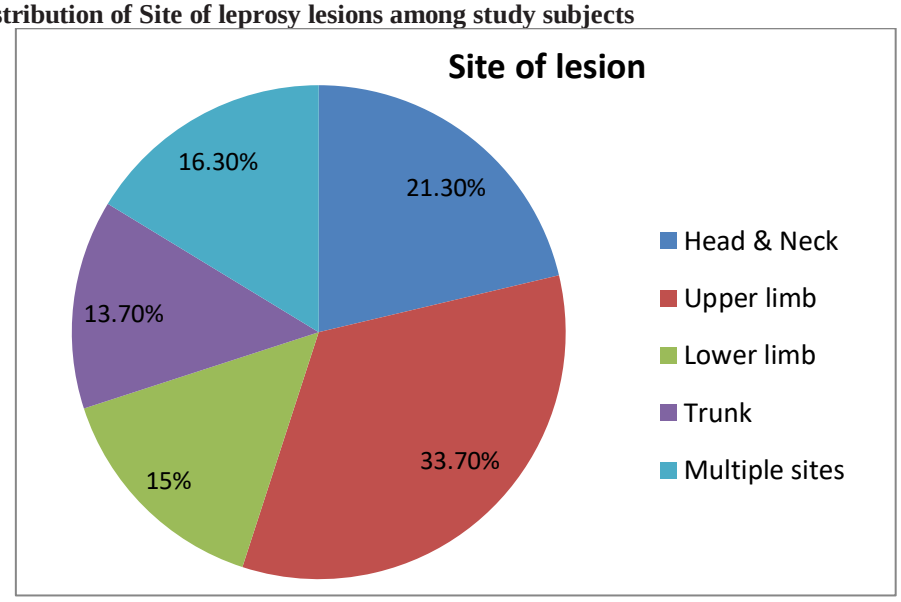

Table 3: Clinical and Histopathological correlation of leprosy cases

Histopathological types	Clinical types						% of Concordance
	TT	BT	BB	BL	LL	IL	
TT (6)	4	2	-	-	-	-	66.7%
BT (35)	2	24	-	7	2	-	68.5%
BB (02)	-	1	1	-	-	-	50%
BL (10)	-	1		7	2	-	70%
LL (16)	-	-	-	1	15	-	93.7%

IL (11)	1	4	1	-	-	5	45.5%
Total (80)	7	32	2	15	19	5	**100%**

DISCUSSION

Leprosy is a chronic granulomatous disease caused due to infection by M. leprae. Depending upon the immune status of the host; leprosy can have varied clinico-pathological presentations. Accurate diagnosis and classification are important for correct timely treatment, management and prevention of disabilities. There are various classification systems in India, but the most widely used Ridley-Jopling classification is based on clinical, bacteriological, pathological and immunological parameters [10].

Leprosy can occur at all ages, but in our study majority of the cases belonged to 31-45 years age group, concordance with the Mridula P, et al [11] and Bommakanti J, et al [12], but discordance to our study Ruchi Sinha et al [13], most of the leprosy patients were 11-30 years age group.

Present study reported leprosy was common in males than female; this finding corroborated that of the studies conducted by Singh et al [14], R Badhan, et al [15] and Semwal et al [16]. Male preponderance might be due to industrialization & urbanization attributed to increased chances of exposure due to increased job-related mobility.

The most common primary sites of the leprosy lesion in the current study were upper extremities followed by head & neck, in agreement with the Naik et al [17] and Tekwani et al [18].

A hypoanesthetic patch and Erythematous plaque/nodule were the most common clinical presentation in our study, consistent result observed by Atram, et al [19] and Suri SK, et al [20]. Since skin and nerves are the most common sites of M. leprae infection, signs and symptoms related to the skin and nerves were common.

In the present study, the most common Histopathological diagnosis was borderline Tuberculoid (BT) followed by Lepromatous leprosy (LL), our reports were comparable with the studies done by Nadia et al [21], DP Thapa, et al [2] and Agrawal S, et al [23]. Contrary to present findings, study conducted by Kaur I et al [24], observed LL type to be the commonest type in their series, whereas, RV Vora et al [25], found TT to be the most common type. Histopathological study is the gold standard for the accurate diagnosis of leprosy.

In the present study concordance between clinical and Histopathological diagnosis for individual type of leprosy was found to be TT (66.7%), BT (68.5%), BB (50%), BL (70%), LL (93.7%) and IL (45.5%). Maximum concordance was observed in LL type of leprosy, which was similar in studies by N Mohan et al [26], Agrawal N, et al [27] and Gridhar M et al [28].The observations strongly suggest the importance of Histopathological diagnosis in these cases, as lesions are easy to diagnose clinically towards Lepromatous pole of the disease.

The overall Clinico Histopathological correlation of leprosy cases in our study was 60-70%. Similar results were obtained by Dewangan B, et al [29] and Bhatia et al [30].

CONCLUSION

The spectrum of leprosy presentation is very wide. Diagnosing this disease is still a challenge. Histopathology is still remains the gold standard for early diagnosis and classification of leprosy. Early diagnosis & treatment of leprosy is required for proper treatment, preventing deformities, and drug resistance. The predominance of borderline spectrum and multibacillary leprosy could be due to lower socioeconomic status, poor sanitary conditions, overcrowding and illiteracy. The findings of this study might help state and centre policymakers to develop more effective strategies for truly achieving the target of eradicating leprosy

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