



A Clinical and Pathological Prospective Study on Leprosy

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ABSTRACT

A total of 53 cases of leprosy diagnosed clinically attending the out patient department of Dermatology, Venereology, Leprology included in the present observational study. Maximum incidence of leprosy was seen in the age group of 21-40 years (66%). Patients of both sexes were affected with predominance of males (73.6%) with a male to female ratio of 2.79:1. The most of the cases were daily wage manual labourers (47.2%) by occupation and were poor (62.26%). 60.4% were from rural area and 39.6% were from urban area. Majority of the patients were illiterates (66%), with 34% literate patients. Most of the patients in this study were married (69.8%). Skin lesions (90.6%), Tingling and numbness (32.1%) were the most common presenting complaints. 3.8% cases presented with deformity. Hypopigmented patches (66%) was the most common skin lesion, followed by erythematous patches and plaque/nodules type lesions in 41.5% cases. 7.5% of cases had satellite lesions. Most of the patients had impaired sensations (92.5%) over the lesions. Multiple asymmetrical nerve thickening was seen in 26.4% of cases. Both clinically and histopathologically BT constituted the predominant group (37.7%) and (32.1%) respectively. Fite Faraco staining of the biopsy specimen was positive in 91.67% cases of LL and negative in all cases of TT and BB. In the other spectrum it was variable. The overall clinico-histopathological correlation was seen in 67.92% and a good concordance was seen in LL (83.33%) followed by TT (66.67%) The least concordance was seen in BB (33.33%). Thus, some degree of overlap between different types of leprosy both clinically and histopathologically. Correlation of Clinical and Histopathological examination appears to be more useful in definite diagnosis and this in turn helps ineffective treatment and prevention of deformities.

INTRODUCTION

Leprosy is a chronic, granulomatous infectious disease caused by *Mycobacterium leprae*. The disease mainly affects the peripheral nervous system, the skin and certain other tissues such as the reticuloendothelial system, bones and joints, mucous membranes, eyes, testes, muscles, adrenals, etc^[1]. Leprosy is one of the oldest diseases of mankind^[2]. Leprosy also known as Hansen's disease, named after Gerhard Armauer Hansen, the Norwegian physician who first identified the microorganism which causes the disease known and dreaded since Biblical times because of the severe deformities that can occur. It was considered incurable until as recently as the 1940s, but nowadays it is curable if proper diagnosis and adequate treatment given at the earliest^[3]. World Health Organization declared it as a major health problem with regard to its association with crippling deformities. This disease particularly causes awful disfiguration, physical pain and hardships. This type of attitude leads to isolation, rejection, social stigma and ostracization that still characterize attitudes toward leprosy. *Mycobacterium leprae* is a gram positive aerobic intracellular obligatory bacteria which is an acid-fast and alcohol fast rod shaped organism surrounded by the waxy cell membrane coating, characteristic of *Mycobacterium* species^[4,5]. Because of extensive loss of genes that are necessary for independent growth, *M. leprae* remains as an obligate pathogen and uncultivable in the laboratory. This factor leads to difficulty in identifying the organism definitively under a strict interpretation of Koch's postulates^[6]. Depending on the degree of immunity in the individuals, this disease express different clinico pathological forms^[7]. Diagnosis of leprosy based on detailed examination of the skin and peripheral nerves and demonstration of acid-fast bacilli in slit skin smear by Ziehl-Neelsen's staining. Early leprosy lesions certainly offers difficulties in clinical diagnosis even in the hands of experienced and skilled dermatologists and leprologists. A definitive diagnosis may be possible by histopathological examination. Hence histological diagnosis is considered as the gold standard for diagnosis of leprosy^[8]. Based on clinical, histopathological and immunological features, Ridley and Jopling proposed a classification which is widely accepted by histopathologists and leprologists. This classification is useful to classify the case, to provide appropriate treatment, to know the prognosis of the patient and also for research work^[9]. Leprosy is a spectral disease and clinical presentation correlates well with histopathological changes and immunological status of that patient^[10-12]. This observational study was undertaken to correlate clinical diagnosis with histological diagnosis in leprosy cases.

MATERIALS AND METHODS

Study Design: The current study was conducted by including cases of leprosy attended the Out Patient Department of Dermatology Venereology Leprology (DVL).

Inclusion Criteria: All clinically diagnosed cases of leprosy who have not been treated.

Exclusion Criteria:

- Old cases of leprosy who have completed the treatment.
- Patients who are on treatment for leprosy and Defaulters.

A detailed clinical history and complete examination particularly with reference to skin, peripheral nerves, sensory and motor disturbances was examined and clinical diagnosis as per the criteria formulated by Ridley-Jopling was made after taking a written and informed consent.

Investigations: Skin biopsy for histopathological examination and Fite Faraco staining. Supplementary slit skin smear if required.

Technique: Written consent was taken from all patients. Lesions with active inflammatory changes were chosen. And the selected site of biopsy was anesthetized with 2% lignocaine after test dosing. Using a 5mm biopsy punch, a cylinder of tissue was cut till the subcutaneous plane by placing the punch perpendicular to the skin and applying a firm downward pressure, when punch touches the subcutaneous fat there was a definitive 'give' indicating that a full thickness cut has been made. The punch was then withdrawn and the cylindrical piece of tissue immediately transferred into a fixative solution (10% formaline). Firm pressure was applied on the wound to prevent bleeding and suturing was done in required patients. specimens were sent to the pathology lab. Following fixation for 12-24hrs, the tissues were processed embedded in paraffin and serial sections of 4-5 microns were obtained which were stained with Hematoxylin and Eosin for histopathological assessment and with Fite-Faraco for identification of the bacilli. The sections were examined for epidermal atrophy, granuloma and infiltrates of lymphocytes, histiocytes, foamy cells, infiltration of nerves, blood vessels, adnexa and the presence of Grenz zone. They are grouped histopathologically as per the criteria formulated by Ridley Jopling, Subsequently a correlation was made between the histopathologic and clinical classification.

RESULTS AND DISCUSSIONS

Out of 53 cases, the maximum number of patients fall into the age group 21-40 years (66%) followed by 41-60 years (20.8%). 4 patients (7.5%) belong to age group below 20 years and 3 patients (5.7%) belonged to 61-80 years. Out of 53 cases, 39 were males and 14 were females. The male (73.58%) were commonly affected than females (26.42%). The ratio of male: female being 2.79: 1. Out of 53 cases, 39 were males and 14 were females. Among both males and females most of them belong to age group 21-40, followed by 41-60 age group in both genders. In the present study

out of 53 cases, maximum number of cases were daily wage labourers (47.2%) followed by housewives (13.2%), dependants (11.3%), students (9.4%). Out of 100 cases, 37 (70.4%) were married, 10 (18.9%) were unmarried and 6 (11.3%) were either divorced, widows, or widowers. Out of 53 cases, 32 (60.4%) cases were from rural area and 21 (39.6%) were from urban area. Out of 53 cases studied, majority of patients were poor (62.3%) followed by lower middle class (34%) only 2 patients (3.8%) were belong to upper middle class. Majority of the cases have skin lesions (90.6%) followed by tingling and numbness (32.1%) and then loss of sensations (24.5%). Ulcerations constitute about 13.2% and reaction symptoms like redness of existing lesion or development of new lesions, redness and watering of eyes, nerve pains etc. constitute 9.4%. 3.8% of cases presented with deformities at the time of presentation. Out of 53 cases, all the cases have any type of skin lesions clinically. Out of them, 20 (37.7%) patients had no of lesions between 2-10 followed by 15 (28.3%) patients with >30 lesions. Out of 10 cases of TT, 9 (90%) cases have single lesion only one case having 2-10 (10%) lesions. Out of 20 cases of BT, 15 (75%) cases have 2-10 lesions, 3 cases (15%) having single lesion and 2 cases (10%) have 11-30 lesions. Out of 3 cases of BB, 2 cases (66.7%) have 2-10 lesions and only one case (33.3%) have single lesion. Out of 8 cases of BL, 3 cases each (37.5%) have 11-30 and >30 lesions and 2 cases (25%) have 2-10 lesions. Out of 12 cases of LL, all cases (100%) have lesions >30. These findings are statistically significant.

Table 1: Type of Lesions (Morphology)

Type of Lesions	Clinical Diagnosis					Total
	BB	BL	BT	LL	TT	
Hypopigmented patches	-	7	17	8	3	35
Erythematous Patches	3	2	4	5	8	22
Plaques_Nodules	3	1	3	8	7	22
Satellite lesions	-	2	2	-	-	4

Out of 53 cases, 49 cases (92.5%) have sensory changes as impaired and 4 cases (7.5%) have intact sensations. Out of 53 cases studied, 31 cases (58.5%) have well defined borders, 12 cases (22.6%) have ill defined borders and 10 cases have (18.9%) partially defined borders. These findings found to be statistically significant.

Table 2: Clinical Diagnosis

Clinical Diagnosis	No. of patients	Percentage (%)
TT	10	18.9%
BT	20	37.7%
BB	3	5.7%
BL	8	15.1%
LL	12	22.7%
Total	53	100.0

Table 3: Histopathological Diagnosis

Histopathological diagnosis	No. of patients	Percentage (%)
TT	13	24.5
BT	17	32.1
BB	1	1.9
BL	8	15.1
LL	12	22.6
IDL	2	3.8
Total	53	100.0

Out of 53 cases of leprosy, 20 cases (37.74%) were Fite Faraco staining positive. 11 out of 12 cases of LL, 6 out of 8 cases of BL, 3 out of 20 cases of BT were positive for Fite Faraco staining. This found to be statistically significant. Out of 53 cases of leprosy, 20 cases (37.74%) were Fite Faraco staining positive. All 12 cases of LL, 5 out of 8 cases of BL, 3 out of 17 cases of BT were positive for Fite Faraco staining. This found to be statistically significant. All TT cases (13), BB (1), IDL (2) cases were negative for AFB on Fite Faraco stain.

A total of 53 cases of leprosy diagnosed clinically attending the out patient department of Dermatology, Venereology, Leprology were taken to the present study. The results were analyzed and compared with other studies and is discussed below. In this study an attempt is made to know the trends of leprosy among age, sex, occupation, literacy, family history, socio economic status, geographical distribution, clinical and histopathological aspects and Clinico-Histopathological correlation. In the present study of 53 cases, maximum number of cases were under 21-40 age group. The youngest age being 8 years and the eldest age being 78 years. In general leprosy is more common in male than females. In the present study, males are more affected than females in the ratio 2.79:1. In our study, it is observed that males being more affected even in the most commonly affected age group 21-40 years. In the present study, it was found to be more leprosy is prevalent among married group of population (69.8%). In the present study, leprosy found to be more common among rural population as compared to urban population. In the present study, leprosy was found to be more among illiterates. In the present study, skin lesions (90.6%) being most common presenting complaint, followed by tingling numbness (32.1%), deformity (3.8%). In the present study, 5.7% (3) of cases showed positive contact history among family or close contact. Out of this 3 cases, one case aged 8 years having contact from the family, one being exposed by profession (ANM) another have contact history among co-worker. In the present study, more number of leprosy cases have hypopigmented patches (66%) as most common type of lesion followed by erythematous patches (41.5%) and plaque/Nodule (41.5%) type of lesions. In the present study, 75.5% of cases have peripheral nerve thickening. Majority of the cases have multiple asymmetrical nerves because most of the belong to BT. In the present study, majority of the clinically diagnosed cases are BT (37.7%) followed by LL (22.6%), Out of 12 cases (22.6%), one case is Histoid hansens, a variant of LL., remaining two cases are LL in type 2 reaction were considered under LL. Least number (3) of cases are under BB (5.7%). Out of 12 cases of LL histologically (22.6%), one case is Histoid hansens, a variant of LL., remaining two cases are LL in type 2 reaction were considered under LL. In the present study, cases of leprosy were classified

according to Ridley-Jopling classification both histologically and pathologically. Out of 10 clinically diagnosed TT cases, 6 (60%) cases correlated histopathologically. Out of 3 clinically diagnosed BB cases, only one (33.3%) correlated histologically remaining 2 cases were BT histologically. Out of 12 cases of LL diagnosed clinically, 10 cases (83.33%) showed concordance histopathologically. In the remaining 2 cases, one is BL and the other is IDL. Out of 12 LL cases diagnosed clinically, 2 cases are LL in Type 2 reaction diagnosed clinically and also were confirmed on Histopathological examination. And one case of LL diagnosed as Histoid clinically showed correlation as Histoid histopathologically. Maximum concordance seen in LL cases (83.3%), followed by TT (60%), then BT (55%), BL (50%), least in BB (33.3%). Correlation is better at poles i.e., Lepromatous (LL) and tuberculoid (TT) than Borderline (BT, BB, BL). In this study, it showed least concordance seen in case of mid-borderline (33.33%). Overall concordance was 67.92% in our present study. In the leprosy spectrum, because of variability in tissue response due to variability in the immunity mainly cell mediated immunity. It is logical to expect some discordance between clinical and histopathological features irrespective of morphology of presenting skin lesions. Out of 12 LL cases, 11 cases were positive for Fite Faraco (91.67%). This can be due to Histopathological diagnosis of the case came to be Indeterminate leprosy which showed negative on Fite Faraco staining.

CONCLUSION

There is some degree of overlap between different types of leprosy both clinically and histopathologically and it is logical to expect some disparity between clinical diagnosis and histopathological diagnosis. Clinico-pathological correlation and correlation with bacterial indices helps to improve classification, infectivity of patient, proper treatment, prognosis and avoids complications. This study determines the clinico-epidemiological pattern of Leprosy and correlates clinical diagnosis with the histopathological findings in leprosy cases, thus highlighting the importance of histopathology in confirming the diagnosis and also it is much useful in the proper treatment of the disease.

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