Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr ICV 2018= 82.06

(e) ISSN Online: 2321-9599; (p) ISSN Print: 2348-6805

Original Research

A Retrospective Study of 6 Years to evaluate Clinico - Histopathological Correlation in Leprosy

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ABSTRACT:
Background: Clinical diagnosis of early leprosy lesions poses difficulties. Present study was conducted to evaluate the correlation between clinical and histopathological diagnosis of Leprosy. **Materials and method:** Two hundred patients reported between 2010 and 2015, in whom leprosy was clinically diagnosed or suspected and histo-pathological examinations were carried upon were involved in the study. **Results**: Results showed that most of the cases belonged to Borderline Borderline (BB) leprosy {50 cases, 25.0%} and minimum {11 cases, 5.5%} were of Histioid (HL) subtype of leprosy. On histopathological study Borderline borderline (BB) subtype of leprosy was found dominant 26 (13.0%) among all subtypes of leprosy followed by Tuberculoid (TT) subtype 26 cases (13.0%). Correlation between clinical and Histopathological diagnosis P=0.032 according to pearson's rank correlation. Highest (94.511%) clinicohistopathological agreement was found in Intermediate Leprosy (IL) and highest (42.85%) disagreement was found in Borderline Line leprosy (BL). **Conclusion**: Since, there is some degree of overlap in different types of leprosy, the correlation can be made more accurate by combining clinical and histopathological features. Skin biopsy may be studied in all cases of leprosy for better diagnosis.
Key words: Leprosy, Histopathology, Skin biopsy.

Received: 22 July, 2019 Revised: 15 September, 2019 Accepted: 20 October, 2019

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This article may be cited as: Sharma N, Chaterjee R. A Retrospective Study of 6 Years to evaluate Clinico - Histopathological Correlation in Leprosy. J Adv Med Dent Scie Res 2019;7(11):209-212.

INTRODUCTION:
Hansen's disease (Leprosy), an ancient curable chronic infectious disease, still continues to be a significant health problem in developing countries. Leprosy is caused by Mycobacterium leprae bacillus, that affects mainly peripheral nerves and skin but may also affect other sites such as the eyes, mucous membranes, bones, and testes and produces a spectrum of clinical types.[1,2]
Leprosy, which was declared eradicated in India one-and-a-half decades ago, has re-emerged in different states with high intensity. India has the highest number of new leprosy cases in the world, followed by Brazil and Indonesia. Every year, over 200,000 such cases are detected globally and India accounts for more than half of these, according to the World Health Organization (WHO). In the past two-and-a-half years, India accounted for 60 per cent of the global total of new leprosy cases. In a recent report, the Central Leprosy Division, which comes under the Union Ministry of Health & Family Welfare, revealed that 13,485 new cases were detected only in 2017, which means that in every four minutes, one person is diagnosed with leprosy in India. As per WHO recent data There were 208 619 new leprosy cases registered globally in 2018, according to official figures from 159 countries from the 6 WHO Regions. Based on 184; 212 cases at the end of 2018, prevalence rate corresponds to 0.2/10 000. [3-5]
According to Ridley & Jopling classification it has been classified on the basis of clinical, histopathological and immunological status of the host. Due to its clinical diversity as well as its ability to mimic other diseases sometimes leprosy is difficult

to diagnose clinically. Histopathological study of leprosy is very important in understanding the disease, its varied manifestations and complications. Early accurate diagnosis is required for the correct and adequate treatment.[6,7] So, clinico-histopathological correlation is extremely important in management. Exact typing of leprosy is sometimes clinically not possible. Also, the poor results obtained by slit skin smear lead to false negative diagnosis. To prevent this, histopathological examination should be done in all suspected cases.

This study was conducted to know the correlation between clinical and histopathological diagnosis of Leprosy.

MATERIAL AND METHODS:

A hospital based retrospective study was conducted in Department of Pathology in a tertiary care hospital.

Source of Data: Clinical data including age, sex, residence, clinical diagnosis, histopathological findings and treatment was retrieved from medical records section after obtaining ethical committee approval of Institute.

Method of Collection of Data: We enrolled patients between 2010 and 2015, in whom leprosy was clinically diagnosed or suspected and histo-pathological examinations were carried upon. Punch biopsies taken from clinically diagnosed new skin lesion of leprosy was taken. History regarding age, sex, site, type of the lesion and clinical classification was noted. Chi square test and Fishers exact test was used for statistical significance and p value.

RESULTS:

In the present study, patients below 30 years age were affected most and patients above 50 years were affected least. [Table 1] Present study showed that leprosy is more common in males (74%) than females (26%). Table 2]

On clinical diagnosis most of the cases belonged to Borderline Borderline (BB) leprosy {50 cases, 25.0%} and minimum {11 cases, 5.5%} were of Histioid (HL) subtype of leprosy. (Table 3)

On histopathological study Borderline borderline (BB) subtype of leprosy was found dominant 26 (13.0%) among all subtypes of leprosy followed by Tuberculoid (TT) subtype 26 cases (13.0%). (Table 4)

Correlation between clinical and Histopathological diagnosis P=0.032 according to pearson's rank correlation. Highest (94.511%) clinicohistopathological agreement was found in Intermediate Leprosy (IL) and highest (42.85%) disagreement was found in Borderline Line leprosy (BL). (Table 4)

On histopathological evaluation on skin biopsies, epidermal changes seen were thinning (11.60%), hyperkeratosis (9.26%), acanthosis (7%) and cleft (1.4%) however it was normal in 69.4% patients Interface dermatitis was seen in 3.8% cases and grenz zone in 6% cases but in 88.10% interface changes were not specified. Of the total 200 patients, dermal changes seen were granuloma (44%), dermal infiltrate (16%), adnexal infiltrate (8%), nerve infiltrate (10%), adnexal with nerve infiltrate (6%), perivascular with adnexal infiltrate (13%) and nonspecific (3%). Dermal infiltrates in 47.4% cases constituted of lympho-histiocytes followed by lymphocyte (38.4%), epitheloid cells (8.4%) and foamy cells (8.4%) but was not mentioned in 3% cases. Of the 4 cases that had infiltrates seen in subcutaneous layer, 2 had giant cells and 1 each had lymphocytes and mixed cellular infiltrates.

Table 1: Age distribution of Leprosy Patients

Age group (years)	Number of cases	Percentage (%)
Below 30	88	44
31-50	80	40
>50	32	16
Total	200	100

Table 2: Gender distribution of leprosy patients

YEAR	TOTAL cases	MALE	FEMALE
2010	44	33	11
2011	36	26	10
2012	33	22	11
2013	35	28	7
2014	27	23	04
2015	25	16	09
Total	200	148 (74%)	52 (26%)

Table 3: Different types of leprosy patients diagnosed from 2010-2015 years

YEAR	Unclassified	HL	BB	TT	BT	IL	LL	BL	Total
2010	7	06	8	4	5	04	06	04	44
2011	9	--	6	6	4	04	4	3	36
2012	7	--	8	8	4	01	2	3	33
2013	3	01	12	8	3	04	2	2	35
2014	6	2	6	4	2	02	4	01	27
2015	4	2	10	2	2	02	2	01	25
Total	**36**	**11**	**50**	**32**	**20**	**17**	**20**	**14**	**200**

TT-Tuberculoid, BT-Borderline Tuberculoid, BB-Mid Borderline, BL-Borderline Lepromatous, LL- Lepromatous, IL- Indeterminate

Table 4: Clinico- histopathological Correlation

H/P diagnosis	CLINICAL DIAGNOSIS								Percentage of agreement
	Unclassified 36	HL 11	BB 50	TT 32	BT 20	IL 17	LL 20	BL 14	
Unclassified	33	3	-	-	-	-	-	-	91.6
HL	-	10	-	-	1	-	-	-	90.90
BB	-	-	26	8	6	-	4	4	52
TT	-	-	3	26	3	-	-	-	81.25
BT	-	-	8	2	8	1	1	-	40.0
IL	-	-	1	-	-	16	-	-	94.11
LL	-	-	3	-	-	1	13	3	65.0
BL	-	-	6	1	1	-	-	6	42.85
Correlation between clinical and Histopathological diagnosis P=0.032 according to pearson's rank correlation									

TT-Tuberculoid, BT-Borderline Tuberculoid, BB-Mid Borderline, BL-Borderline Lepromatous, LL- Lepromatous, IL- Indeterminate

DISCUSSION:

Leprosy is a slowly progressive infection caused by Mycobacterium leprae affecting the skin and peripheral nerves. Histopathological examination of skin lesion is the gold standard for accurate diagnosis. During the study period of 6 years in the present study, total 200 skin biopsies were carried out to know the correlation between clinical and histopathological diagnosis of Leprosy.

Leprosy can occur at all ages. In the present study, patients below 30 years age were affected most and patients above 50 years were affected least. Similar observations were made by Guha et al, Kaur S et al, and Murthy et al. Variable and long incubation period may be responsible for this age distribution.

Present study showed that leprosy is more common in males (74%) than females (26%). This is observed in studies by Sehgal et al[8], Nadkarni et al[9], Moorthy et al[10] etc. Several factors influence the sex predominance in endemic areas, mainly the opportunity for contact. Practically no difference is noted when the opportunity for contact remains the same. Male predominance may be because of many factors like industrialization, urbanization and more opportunities for contact in males. Social customs and taboos may account for the smaller number of females reporting for treatment to the hospital.

Present study showed that clinically most of the cases belonged to Borderline Borderline (BB) leprosy {50 cases, 25.0%} and minimum {11 cases, 5.5%} were of Histioid (HL) subtype of leprosy.

On histopathological study Borderline borderline (BB) subtype of leprosy was found dominant 26 (13.0%) among all subtypes of leprosy followed by Tuberculoid (TT) subtype 26 cases (13.0%). Correlation between clinical and Histopathological diagnosis P=0.032 according to pearson's rank correlation. Highest (94.511%) clinicohistopathological agreement was found in Intermediate Leprosy (IL) and highest (42.85%) disagreement was found in Borderline Line leprosy (BL). similar to several studies published in literature.

In a study of Kumar et al[11], out of 372 cases, 269 (72.31%) were BT. Manandhar U et al[12] studied 75 cases in which 30 (40%) cases were BT histologically. Present study showed statistically significant correlation between clinical and histopathologic diagnosis. Kumar et al[11] found clinicopathological correlation in 60.6% of cases and Rizvi et al in 2015 in 70% cases.[13]

The disparity between clinical and histological observations was anticipated because the parameters used for the histopathologic classification are well-defined, precise and also take into account the immunologic response of the tissue, while the clinical classification gives recognition only to the gross appearances of the lesions which is due to the underlying pathological change.

Moreover, a sizable proportion of leprosy cases (BT+BB+BL) are in a continuously changing immunological spectrum and histological classification gives a better indication for any recent shift of a case position in the spectrum. In some early cases, clinical signs and symptoms may precede the presently known characteristic tissue changes, or vice versa. If a biopsy is taken at an early stage, there is likely to be discordance between the clinical and histopathologic observations. As disparity depends upon the lesion biopsied at the time of study, biopsy from the lesion which is morphologically suggestive of clinical diagnosis, serial biopsies from the same lesion, or from paired lesions, should be studied for a better clinico-histopathological correlation.[10-13]

It is therefore important to have histopathological evaluation in suspected case of leprosy mostly in the Borderline groups and where slit skin smears are negative. Clinical information like site of lesion, type of lesion, nerve involvement, sensory impairment, treatment history along with immunological status of patients is very important for the pathologist to correlate histopathologically. Histopathological diagnosis also depends on various factors like size of biopsy specimen, age of lesion, depth of biopsy, quality of section and very important interobserver variation has a role in clinico-pathological evaluation. In TT, histopathologically well formed epithelioid cell granulomas with a rim of lymphocytes distributed throughout the dermis, particularly along adnexal structures and neurovascular bundles and encroaching the basal layer of the epidermis will be seen. In BT, granulomas have fewer number of lymphocytes and more giant cells and epidermal erosion will not be seen. Erosion into the epidermis with absence of Grenz zone when present is a useful feature in differentiating TT from BT. In BL, granuloma rich in foamy histiocytes and few epithelioid cells are seen and LL characterized by diffuse sheets of foamy histiocytes with Grenz zone. In BB, the macrophages are uniformly activated to epithelioid cells but distinct granulomas and lymphocytes are scanty. Dermal edema will be prominent between inflammatory cells. In indeterminate leprosy, there is mild lymphocytic infiltration around neurovascular bundles, sweat glands.[8-13]

The present study emphasizes the importance of histopathological examination and bacillary index in the management of Leprosy. Increased number of borderline cases detected point towards the effectivity of the National Programmes. However, the sample size was small as the study was conducted in a short duration and in selected cases. Therefore, the results cannot be extrapolated.

CONCLUSION:

Sometimes it is difficult on clinical grounds due to its varied presentation and could mimic with other diseases therefore histopathological examination is needed to confirm diagnosis for proper treatment category and decrease the burden of the disease in the society.

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