Role of histopathology in diagnosis of leprosy- A tertiary care hospital based study

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Abstract

Introduction: Leprosy is continuous spectrum of varied clinicopathological manifestations of the disease.[1] leprosy still continues to be one of major health problem due to consequent disabilities and social stigma.[2,3] Timely diagnosis helps in proper treatment and reduce the chances of recurrence. It is chronic infection which affects skin and peripheral nerves.[4,5] The nerve biopsies are difficult, diagnosis mainly depends upon clinical examination of skin lesions and histopathological diagnosis. Most of leprosy cases were diagnosed without histopathological examination.[6] The aim of the present study was to know the Role of skin biopsy in diagnosing leprosy cases.

Materials and Methods: This was a cross sectional comparative study of skin biopsies of clinically suspected or diagnosed leprosy cases coming to the tertiary care hospital.

Results: Sixty two (62) biopsies were included in the study. All biopsies were classified histologically compared with clinical diagnosis. Out of 62 cases, BB was the main clinical diagnosis comprising 19(30.6%) followed by BL 16(25.8%), LL 11(17.8%), IND 9(14.5%), BT 5(8.1%) and TT 2(3.2%) remaining. Out of these 62 cases, 40 (64.5%) cases histopathological diagnosis were agreed with clinical diagnosis.

Conclusion: Histological examination is an important tool in the accurate diagnosis of leprosy. Indeterminate and borderline leprosy cases diagnosed on clinical grounds are difficult due to it's varied presentation and could mimic with other diseases, therefore histopathological examination is useful to confirm diagnosis and accurate typing of leprosy for proper treatment.

Keywords: Leprosy, histopathology TT-tuberculoid, BT-Borderline Tuberculoid, BB-Borderline Borderline, BL-Borderline Lepromatous, LL-Lepromatous leprosy.

Introduction

Leprosy is continuous spectrum of varied clinicopathological manifestation of the disease depends upon the immunity against bacterial infection *Mycobacterium leprae*.[1] Though Leprosy cases has been reduced according to Annual New Case Detection Rate (ANCDR), leprosy still continues to be one of major health problem due to consequent disabilities and social stigma.[2,3]

Timely diagnosis helps in proper treatment and reduce the chances of recurrence. It is chronic infection which affects skin and peripheral nerves.[4,5] The nerve biopsies are difficult, diagnosis mainly depends upon clinical examination of skin lesions and histopathological diagnosis. Most of leprosy cases were diagnosed without histopathological examination.[6]

Due to its clinical diversity and mimics other diseases, for correct labelling and confirming the diagnosis in doubtful cases histopathology is pivotal role.[7,8] The present study was carried out to know the usefulness of histopathological diagnosis for helping clinical diagnosis and treatment.

The aim of the present study was to know the Role of histopathology in diagnosing leprosy cases.

Materials and Methods

Patients attending to the Dermatology department of tertiary care hospital with clinically suspected leprosy cases are included in the study. Both old and new cases are included in the study after taking informed written consent. This was a cross sectional comparative study of skin biopsies of 62 leprosy patient received over a period of 2 years from March 2016 to April 2018. Ethical Committee clearance was taken before conducting the study.

Skin biopsies with 0.4 cm thickness and fixed in 10% buffered formalin were consider for the study. After routine paraffin processing skin biopsies were stained with Haematoxylin and Eosin stain (H&E) to assess the morphology under microscopy. Clinical classification of leprosy were noted according to dermatologist and Ridley-Jopling histopathological classification was assigned to each case for comparison. According Ridley-jopling types are Tuberculoid(TT), Borderline tuberculoid (BT), Borderline Borderline (BB),Borderline lepromatous (BL), Lepromatous Lepromatous (LL) and Inderterminate leprosy (IL). Statistical analysis was done using SPSS 16.0.

Inclusion criteria: All cases clinically diagnosed as Leprosy.

Exclusion criteria: Patients with pure neuritic forms were not included in the study.

Results

Sixty two (62) biopsies were included in the study. All biopsies were classified histologically and then compared with clinical diagnosis. The age distribution of patients varied between 15-75 years, with peak between 46-60 years followed by 15-30 years. Among

the total 62 case 34 were males and 28 were females with slight male preponderance.

Out of 62 cases, BB was the main clinical diagnosis comprising 19(30.6%) followed by BL 16(25.8%), LL 11(17.8%), IND 9(14.5%),BT 5(8.1%) and TT 2(3.2%) cases (Table 1). Table 1shows Out of these 62 cases, 40 (64.5%) cases histopathological diagnosis correlated with clinical diagnosis. Most of the histopathological discordance was seen in indeterminate cases 8(88.9%) followed by BB cases 7(36.8%).

In 22 Clinico-histopathological discordance cases, histologically 11 cases diagnosed as BL , 4 cases diagnosed as LL (Fig. 3) , 2 cases diagnosed as BT(Fig. 1) and 5 cases were diagnosed as BB.(Table 3)(Fig.2)

Considering the polar groups for merging on histological basis due to there is no difference in the plan of treatment, after merging TT cases and BT cases the total cases were 2 and merging BL and LL cases the total cases were 15 (Table 4). Merging the polar groups on histological basis, clinicopathological concordance increased 64.5% to 91.9% (Table 4). Table 5 compares the percentage of agreement by different authors with our study.

Discussion

Diagnosis of leprosy is based on clinical examination, histopathological diagnosis and demonstration of acid fast bacilli by Ziehl-Neelsen's staining. Histopathological diagnosis plays a crucial role in diagnosis and typing of leprosy, especially in indeterminate cases i.e clinically suspected but not able to categorized the type and Borderline cases.

Present study includes 62 patients age ranging from 15-75years, majority patients were males, in the middle age group 35-45 years with mean age of 38 years. According to Robertson LM et al the mean age was 39.5% and according to Van Brakel WH *et all.* 41years.[9] This shows middle age groups are commonly effected. This needs early diagnosis and prompt treatment to reduce the social burden.

Ridley-Jopling classification has been widely used by histopathologist. In the present study Ridley-Jopling classification was used for histological typing of leprosy. According to the classification they are 5 sub types TT, BT, BB, BL, and LL. We included histioid type in LL. Clinical diagnosis were reviewed after the histological results were available. The pathologist were looking for different factors making the diagnosis. Histological diagnosis depends upon the demonstration of the type granuloma, giant cells, the intensity of lymphocytes involving various zones of skin and macrophages. Towards TT histological diagnosis mainly on epithelioid cells, Langhans type of giant cells and lymphocytes whereas LL to diagnose foamy macrophages should be present.[10] These signs can be variable in borderline types.

Present study shows most of the leprosy cases diagnosed clinically are in borderline 64.5% (40/62)which includes BT,BB and BL. Similar borderline predominance was observed by Sharma A and Sharma RK,[11] Moorthy,[12] Nadkarni and Rege,[13] Shenoi and Sidapp.[14]

Present study shows percentage of agreement between clinical and histopathological diagnosis was 64.5% (40/62) (Table 5). Percentage of complete agreement between the clinical and histological diagnosis by different authors range from 62.63% to 81.8%. The highest percentage of correlation was seen in a study done by Nadkarni NS et al found parity in 81.8%,[13] Marthur et al in 80%[15] and Kar PK et al in 70%.[16] Similar results was observed by different authors, Bhatia AS et al found parity in 69%,[17] Jerath et al in 68.5%,[18] Pandy et al in 68.3%,[19] Kalla G. et al in 64.7%.[20]

Present study shows best clinico-pathological agreement was found in TT 100%(2/2), LL 81.8%(9/11) and BL 81.3%(13/16). Nadkarini et al found similar predominance of agreement in all 3 poles, 97%in TT pole, 98% in LL and 87% in BL pole.[13] In studies Kar Pket al found 87.5% parity in TT pole and Bhatia AS et al found 91% parity in LL pole.[16,17]

The disagreement was highest for BB 36.8%(7/19) after excluding BT. Similar result was noted in BB by Singhi et al.[21] BB is most unstable form it needs correlation. Present study shows clinically 7 cases were diagnosed as BB, out of which 5 cases were diagnosed as BL and 2 cases were diagnosed as BT after histological review. In the present study high percentage of indeterminate leprosy cases 9(14.5%) were diagnosed clinically as against 1 case (11.1%) histopathologically, the remaining 8 cases were histologically classified as BB, BL and LL (Table 3).

There were significant difference between the clinical and histological diagnosis in the borderline leprosy rather than polar forms. Both TT and BT were histologically two different diagnosis of spectrum of one side of the disease, similarly BL and LL also two different diagnosis of other side of the spectrum of the disease. Merging of these groups as poles there is no difference in the treatment plan. In Present study merging of this groups considering histological diagnosis, clinicopathological concordance was increased from 64.5% to 91.9%, after excluding BB (Table 4). Similar increase in clinicopathological concordance was seen in Bhatia et al.[17]

Though minor disparities can be anticipated between the clinical and histopathological diagnosis, consideration of histopathological diagnosis is essential for correct and early diagnosis.

Table 1: Percentage of agreement of Histopathological diagnosis with Clinical diagnosis

Clinical Groups		HPE Correlated with clinical diagnosis	
Types	Number	Number	Percentage
TT	2	2	100
BT	5	3	60.0%
BB	19	12	63.2%
BL	16	13	81.3%
LL	11	9	81.8%
IND	9	1	11.1%
Total	62	40	64.5%

Table 2: Percentage of histopathological disagreement with clinical diagnosis

Clinical groups	Number and percentage of HPE disagreement with clinical types
TT	-
BT	2(40.0%)
BB	7(36.8%)
BL	3(18.7%)
LL	2(18.2%)
IND	8(88.9%)
Total	22(35.5%)

Table 3: Histological diagnosis of discordance cases

Clinical diagnosed cases	Histological discordance	Histological diagnosis
BT	2	BB=2
BB	7	BL=5 BT=2
BL	3	LL=2, BB=1
LL	2	BL=2
IND	8	BB=2, BL=4,LL=2

Table 4: Percentage of agreement after joining the groups

Histologically merged groups	Total no. of cases
TT+BT(0+2)	2
BL+LL(11+4)	15
Total no of cases diagnosed	17 (17+40=57/62) (91.9%)

Table 5: Comparison   of percentage of clinicopathological agreement by different authors

	Present study	Moorthy BN et al	Kalla G. et al	Nadkarni NS et al	Kar PK et al	Bhatia AS et al
Number of cases	62	372	736	2640	120	1272
Percentage of Agreement	64.5%	62.63%	64.7%	81.8%	70%	69%

Conclusion

Histological examination is an important tool in the accurate diagnosis of leprosy. Indeterminate and borderline leprosy cases diagnosed on clinical grounds are difficult due to it's varied presentation and could mimic with other diseases, therefore histopathological examination is useful to confirm diagnosis and accurate typing of leprosy for proper treatment.

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