Clinico-Histopathological Correlation in Leprosy: At M.Y. Hospital Indore

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Abstract

Objective: *Leprosy is a chronic infectious disease of skin and peripheral nerves has been classified by multiple authorities, like Madrid classification(1953), WHO classification (1982), Indian classification and Ridley Jopling classification of which most widely accepted is Ridley and Jopling classification in 1966.They classified leprosy on the basis of clinical, histopathological, immunological and bacteriological parameters in to LL(lepromatous leprosy), BL(borderline leprosy), BB(mid borderline), BT(borderline tuberculoid),TT(tuberculoid) is a continous spectrum with frequent transformation of one form in to another. Study aims at clinic-histopathological correlation in leprosy which would helps to predict the course, outcome and complications of the disease.**Material & Methods:** The present study was conducted in the Department of Pathology, M.G.M. Medical College, Indore on 100 patients. All the clinically diagnosed and suspected patients of leprosy during a period of 2015 to 2018 were enrolled in the study .**Results:** Total 100 patients were studied, out of which 66 were males and 34 were females. On clinical evaluation BT was diagnosed in 52%, TT in 33% ,BLin 6%, in IL 4% , LLin 2% and not specified in 1% patients. On histopathological evalution, epidermal changes seen in 47% and dermal changes like granuloma formation seen in 40 % ,dermal infiltration in 20%, adnexal infiltration in 8%, nerve infiltration in 7%, adnexal with nerve infiltration in 10%, perivascular with adnexal infiltration in 9% and non specific cases in 1% ,therefore BT(35%) was the most common histopathological diagnosis after that TT(30%)followed by BL(3%),LL(2%) and BB (1%).**Conclusion** :When we correlate this study we found that maximumclinico histopathological correlation was noted in LL(100%), TT(90.9%), BT(67.30%) and least correlation seen with BB(50%) and BL (50%).*

Keywords:*Leprosy, Histopathology, Ridley Jopling***.**

INTRODUCTION

Leprosy is also known as Hansen's disease, is a granulomatous, infectious disease caused by mycobacterium laprae, which affects skin and peripheral nerves.[1] The signs of the disease are hypoesthetic skin lesion, thickened peripheral nerves and acid-fast bacilli in slit skin smear.[2].

On january30, 2006 ,India announced the elimination of leprosy as a public health problem at National level.After reaching the elimination it is still endemic in few states that's why it is major public health problem in India.[3].WHOThe Global Leprosy Strategy 2016–2020: "Accelerating towards a leprosy-free world" was launched in April 2016. Principles of the strategy are - initiating action, ensuring accountability and promoting inclusion. [4].In India on 2007, new cases of leprosy were 137,685, and nine years later in 2016, the number of new cases are almost equal at 135,485, but when we compare the new cases of leprosy between year 2015 and year 2016 , we found that the cases in the year 2016 were significantly increases over the 127,326 cases detected in 2015. This increase in new cases is attributed by NLEP to their recent strategy of innovative Leprosy Case Detection Campaign (LCDC), which resulted in the detection of 34 000 new cases in 2016 from highly endemic , which accounted for 25% of annual new cases.[5].Ridley and Jopling (1966) given a five group histological classification reflecting the immunological spectrum and this classification has been widely accepted by histopathologists. .5 groups are,Tuberculoid leprosy (TT), it is a polar form of leprosy,in which few lesions and a paucity of organisms are seen. The other polar form is Lepromatous Lepromatous leprosy (LL), in which there arenumerous lesions and associated with absence of cellular immune response. Three are borderline form In between these poles likeBorderline-Tuberculoid (BT), Borderline Borderline (BB) and Borderline- Lepromatous (BL) leprosy. Polar forms (TT and LL) are the most stable and the Borderline forms (BB) the most labile[6].Clinicaldiagnosis done on the basis of visual appearances of the lesions and nerve sensation,

while the histopathological diagnosis done on the basis of presence or absence of granuloma ,bacterial load (BI), distribution of lymphocytes, involvement of nerves and thepresence or absence of the subepidermal grenzzone and epidermal changes.Histopathology gives aconfirmatory diagnosis for suspect cases which can be missed by clinician or epidemiological studies and helps in exact typing. Histopathology also helps in indicationof progression and regression of disease under treatment[6]**[7].**Ridley Jopling Classification

TABLE1

Immune Response	High Resistance		Unstable Resistance		Little or No Resistance
Clinical Spectrum	Polar Tuberculoid (TT)	Borderline Tuberculoid (BT)	Mid Borderline(BB)	Borderline Lepromatous(BL)	Polar Leprosy(LL)
No. of skin lesion	Few usually single	Few	Few or many	Many	Many
Bacillary load(slit smear skin test)	0 or rarely,+1	+1	+2	+3	+4
Lepromin Test	Positive	Positive	Positive, doubtful, no response	Doubtful or no response	No response
Histology	Epitheloid granulomas ringed by lymphocytes found around dermal appendages and nerve in both papillary and reticular dermis, extending up to epidermis, caseation necrosis may occure.nerveedema infiltration by AFB bacilli or destruction	Epitheloid granulomas by moderate number of lymphocytes. Langhans giant cell can be present. Rare infiltration of subepidermal zone. Nerve edema and infiltration by AFB bacilli and destruction.	Granuloma consist of foamy macrophages. Number of lymphocytes in granuloma are generally less. Langhans cell absent.dermal nerve show schwann cell proliferation.infiltration by lymphocytes, foamy macrophages.	Increasing histiocytes and fewer epitheloid cells and lymphocytes.foamy macrophages. Lipid laden granulomas with grenzzone.nerve bundle damaged.	Massive granulomas or diffuse sheets of foamy lipid laden granuloma with grenz zone present.multiple even large multinucleated globi. Nerve bundle damaged

MATERIALS AND METHODS

This was a retrospective study conducted in the Department of Pathology, M.G.M. Medical College Indore involving 100 patients. All the clinically diagnosed and/ or suspected patients of leprosy during May 2015 to May 2018 were enrolled in the study .Thedata were retrieved from the records maintained in the department including age, sex,residence, clinical diagnosis, histopathological findings.

RESULTS

Total 100 patients were studied, out of which 66 were males and 34 were females.The age of the patients ranged from 8 to 70 years. On clinical evaluation borderline tuberculoid(BT) was diagnosed in 52%, tuberculoid leprosy(TT) in 33% ,borderline leprosy(BL) in 6%, Indeterminate leprosy in(IL) 4% , BB in 2%, LLin 2% and not specified(? Hansen) in 1% patients.

Figure1

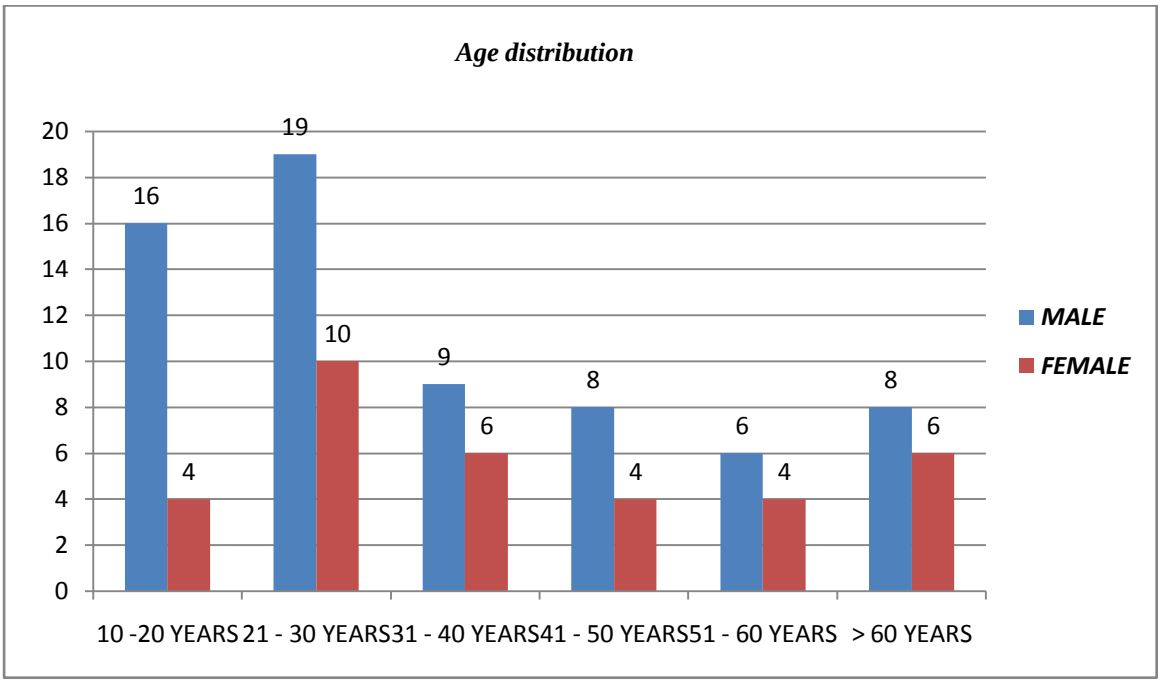

Figure 2:

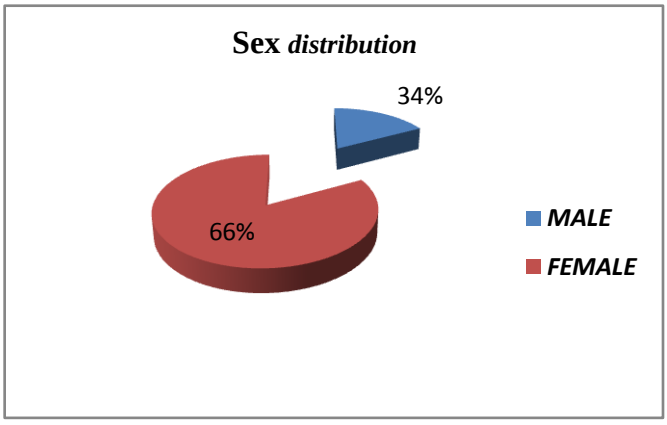

TABLE 2: DISTRIBUTION OF CASES IN INDIVIDUAL CATEGORIES BASED ON CLINICAL AND HISTOPATHOLOGICAL CRITERIA

Types of leprosy	Clinical diagnosis	Histopathological diagnosis
TT	33%	30%
BT	52%	35%
BB	2%	1%
BL	6%	3%
LL	2%	2%
Indeterminate	4%	0%
Other than Hansen	1%	1%

TT: Tuberculoid Leprosy, BT: Borderline tuberculoid, BB :MidBorderline, BL: Borderline lepromtous, LL: Lepromatous leprosy, IL: Indeterminate leprosy. On histopathological evalution, epidermal changes seen in 47% and dermal changes like granuloma formation seen in 40 % ,dermal infiltration in 20%, adnexal infiltration in 8%, nerve infiltration in 7%, adnexal with nerve infiltration in 10%, perivascular with adnexal infiltration in 9% .

TABLE 3: CORRELATION BETWEEN CLINICAL AND HISTOLOGICAL DIAGNOSIS

CLINICAL DIAGNOSIS		HISTOPATHOLOGICAL DIAGNOSIS						
	TT	BT	BB	BL	LL	Indeterminate	Not specified	(correlation) Parity
TT 33%	30	0	0	0	0	3	0	90.9%
BT 52%	0	35	0	5	0	12	0	67.30%
BB 2%	0	0	1	0	0	1	0	50%
BL 6%	0	0	0	3	0	3	0	50%
LL 2%	0	0	0	0	2	0	0	100%
Indeterminate 4 %	0	0	3	0	0	0	1	0%
Not specified 1%	0	0	0	0	0	0	1	100%

Figure 3:

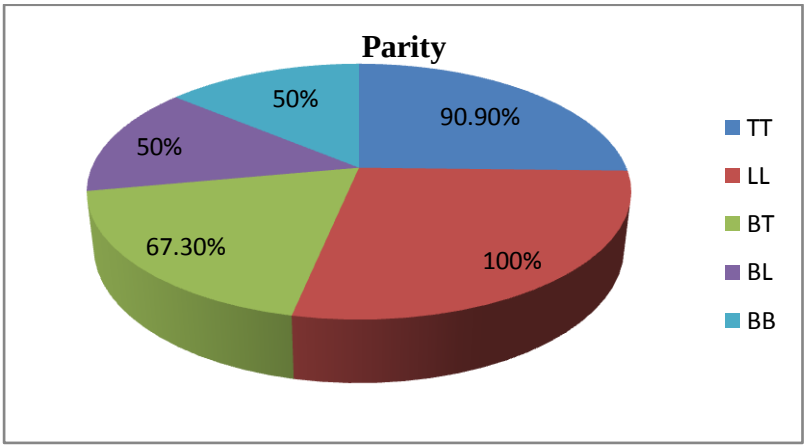

TABLE 4: INTEROBSERVER VARIATION ACCORDING TO TWO PATHOLOGIST

Categories	Observer 1	Observer 2
TT	30	30
BT	35	33
BB	1	2
BL	3	4
LL	2	2

Statistical Analysis :- In our study we found that the Kappa Value is 0.89, that indicates the inter-observer agreement is very good**.**

CLINICAL AND HISTOPATHOLOGICAL FINDINGS :

TUBERCULOID LEPROSY-

Figure 4 show hypoesthetic patch

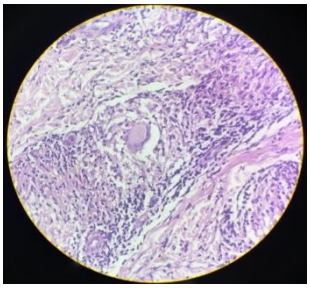

Figure 5: show granuloma Formation

BORDERLINE TUBERCULOID LEPROSY :-

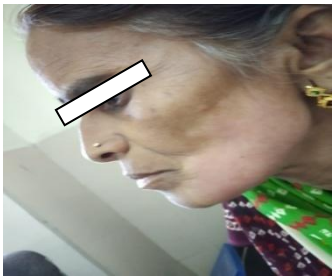

Figure 6

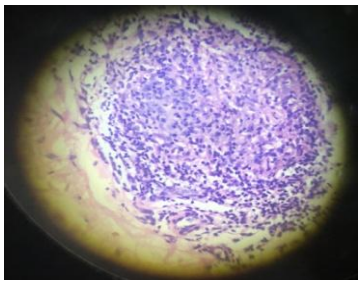

Figure 7

***LEPROMATOUS LEPROSY* :-**

Figure 7: multiple shiny plques

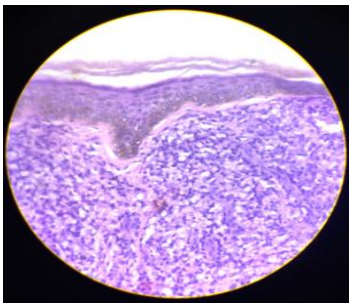

Figure 8: clear zone with macrophages And lympho-histiocytic

BORDERLINE LEPROMATOUS LEPROSY

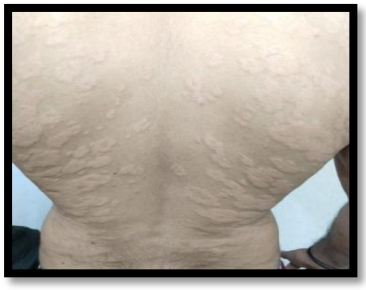

Figure 9: Multiple illdefined plaues

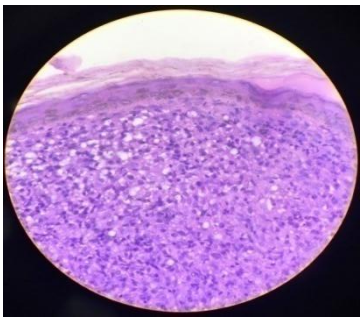

Figure 10: Foamy macrophages with more lympho-histiocytic infiltration

DISCUSSION

The Ridley Jopling classification is a standard classification for detection and gives exact typing of of leprosy which is based on clinical, histopathological and immunological condition of the host.In our study clinic-pathological correlation was found in LL,TT,BT,BL were 100%, 90.9%, 60.7%,50% respectively. due to lack of availability of slit skin smear test and lepromin test only two criteria we used that are clinical and histopathological criteria from Ridley Jopling Classification. BT(35%) was the most common histopathological diagnosis after that TT(30%)followed by BL(3%),LL(2%) and BB(1%).On statistical analysis it was found to be significant ($p < 0.05$). When we compare our study from different studies we found Pandya et al found parity in 68.3%[8], Moorthy et al in 62.63%[9], Kar et al in 70%[10] and Jerath et al in 68.5%[11] . In most of these studies like moorthyet al, Kar et al[10] and Jerath et al[11] found parity in TT pole and Mathur et al in LL pole[9,10,11,12]. Our study also found parity in TT and BT which is similar to Kar et al[10] and Jha et al[13]Better clinico-histopathological correlation was seen towards the polar groups. Similar rise in clinico-histopathological concordance of tuberculoid group and lepromatous group was also noted by Sharma et al[14].tissue response varies in the disease spectrum due to variability of cell mediated immunity, it is logical to expect some disparity between clinical and histopathological features. According toRidley and Jopling histopathological criteriaattention is given to the epidermal atrophy,presence of clear sub epidermal Grenz zone,dermal inflammatory infiltrate, presence andcomposition of granulomas , presence of giant cellsand relative proportion of lymphocytes and foamy histiocytes. The disparity found between clinical and histological diagnosis because histopathological diagnosis done on the basis of microscopic picture while the clinical finding gives recognition only to the gross appearances of the lesions which is due to the underlying pathological change.Moreover if a biopsy is taken at an early stage, there will be some differences between the clinical finding and histopathological finding.

As disparity depends upon the site of lesion, site of biopsy, some times clinically patient was diagnosed but due to inadequacy of biopsy histopathological diagnosis can not be made, biopsies from the same lesion, or from paired lesions, should be studied for clinico-histopathological correlation.

CONCLUSION

Clinico-histopathological correlation helps to predict the course, outcome and complications of leprosy.There is some degree of overlap in different types of leprosy, the diagnosis can be made more accurate by combining clinical and histopathological features.The Ridley Jolipling classification is standard classification for accurate the diagnosis of leprosy which is based on clinical, histopathological and immunological criteria.

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