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Original Research Article

Clinical and histopathological correlation in leprosy: A two year prospective study

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ABSTRACT

Background: Leprosy is known to man since ancient times. Leprosy bacillus was discovered by Gerhard Henrick Armauer Hansen in 1873. Ridley-Jopling classification takes into consideration clinical, bacteriological, histopathological and immunological factor. The present study was done to correlate clinical and histopathological diagnosis.
Materials and Methods : Fifty newly diagnosed cases of leprosy were included in the study during the period from August 2011 to August 2013. H and E stained sections were observed for histopathological features and classified according to Ridley & Jopling classification and a clinicopathological correlation was made.
Result: Maximum numbers of cases diagnosed histopathologically belonged to borderline tuberculoid 18(36%) cases. Hundred percent correlation was seen between clinical diagnosis and histopathological diagnosis in tuberculoid leprosy. The overall clinico-histopathological correlation in our study was 62%.
Conclusion: Histopathological classification is accurate as it considers immunologic response of the tissue, whereas clinical classification considers only gross appearances of the lesions. Borderline leprosy cases are in a continuous changing immunological spectrum and histopathologic classification identifies any recent shift of a case in the spectrum.

1. Introduction

Leprosy is known to man since ancient times. It causes extreme disfigurement due to which the affected persons were always mistreated, socially outcast and made to live in special dwellings.[1] Leprosy bacilli was discovered by Gerhard Henrick Armauer Hansen in 1873.[2] In earlier days leprosy was considered as a hereditary disease.[3] Developing countries like India, Southeast Asia region, central and east African region have high prevalence rate.[4] India had a prevalence rate of 0.66/10,000 population in 2016. Globally India contributes 60% of newly reported cases every year.[5]

Mycobacterium Leprae has never been cultured in artificial media. Armadillo and foot pad of mice have been used for growth.[4] This organism has defective heat stress response due to which it prefers cooler region of the human body like dermal macrophages, macrophages infiltrating the aqueous humor and the iris of the eye, and Schwann cells of the peripheral nerves for survival and growth.[6]

Different classification systems have been proposed over the years; The Manila classification in 1931,[7] The Cairo classification in 1938,[8] The Madrid classification in 1953,[7] new IAL classification in 1981.[7] In our present study we have used Ridley- Joplings classification.[9]

Ridley-Jopling classification takes into consideration clinical, bacteriological, histopathological and immunological factors. According to this classification leprosy is considered as a spectrum and divided into tuberculoid (TT), borderline tuberculoid (BT), mid borderline (BB), borderline lepromatous (BL) & lepromatous (LL).[9]

The present study was done to correlate clinical and histopathological diagnosis in leprosy using Ridley-Jopling

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classification.

2. Materials and Methods

The present study was undertaken in the Department of Pathology, Al- Ameen Medical College, Bijapur. Skin biopsies from 50 patients who were clinically diagnosed to have leprosy were included in present study. All newly diagnosed cases of leprosy regardless of age, sex, and socioeconomic status were included in the study. Cases with inadequate biopsies and on treatment for leprosy where excluded from the study.

A detailed clinical history, examination findings indicating signs and symptoms of the skin lesions and provisional clinical diagnosis were collected. Skin biopsies were sent to the department of pathology in 10% formalin. After adequate fixation for 12-24 hours, the biopsy specimen were submitted for routine processing, followed by paraffin embedded sections 4-5μ thickness were stained with H and E for morphology and with Fite-Faraco for identification of the bacilli.

H and E stained sections were observed for histopathological features and classified according to Ridlley & Jopling classification and a clinicopathological correlation was made.

3. Result

Fifty newly diagnosed cases of leprosy were included in the study during the period from August 2011 to August 2013. Patients age ranged from 12 years to 73 years with majority of patients being in 21-40 years age group. There was male preponderance with male to ratio of 1.6:1. Maximum number of cases clinically diagnosed belonged to BT 23(46%) cases, followed by LL 8(16%) cases, IL 7(14%) cases, BL 6(12%) cases, TT 4(8%) cases and BB 2(4%) cases. Maximum numbers of cases diagnosed histopathologically belonged to BT 18(36%) cases, BL 10(20%), IL 9(18%), TT 7(14%), LL 5(10%) and BB 1(2%).

There was 100% correlation between clinical diagnosis and histopathological diagnosis in TT followed by 71.43% in IL, 66.67% in BL, 56.52% in BT, 50% in BB and LL. The overall clinico-histopathological correlation in present study was 62%.

4. Discussion

Leprosy is still a major public health problem in developing countries like India. Among many classifications for leprosy Ridley-Jopling's classification is preferred. It takes into consideration clinical, histological and immunological criteria. This classification is used by many pathologists and leprologists.[10] In our current study we have classified the cases based on Ridley-Jopling classification; indeterminate type was also included in the study.

Table 1: Clinical type of leprosy

Clinical type	No of cases	Percentage
TT	4	8%
BT	23	46%
BB	2	4%
BL	6	12%
LL	8	16%
IL	7	14%
Total	50	100%

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

Table 2: Histopathological type of leprosy

Histopathological type	No of cases	Percentage
TT	7	14%
BT	18	36%
BB	1	2%
BL	10	20%
LL	5	10%
IL	9	18%
Total	50	100%

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

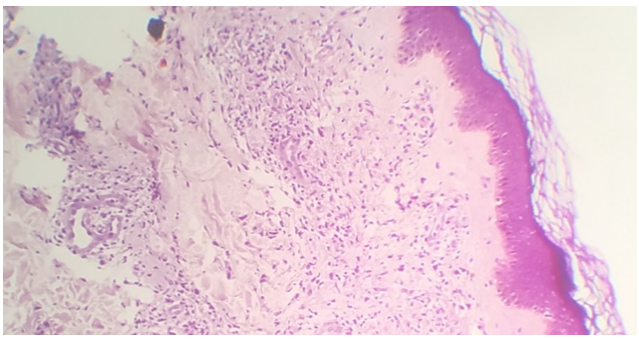

Fig. 1: Photomicrograph showing histopathologicalfeatures of Borderline Tuberculoid Leprosy (10X Objective, H & E)

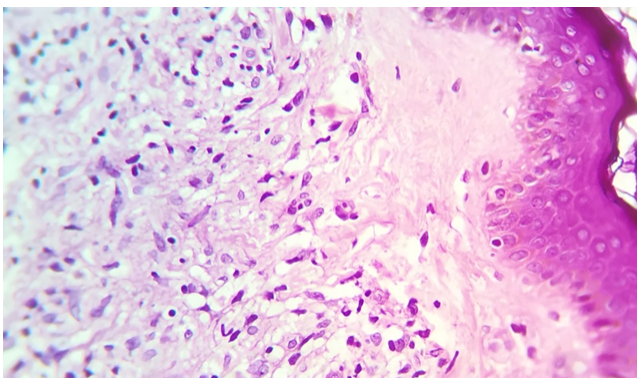

Fig. 2: Photomicrograph showing histopathologicalfeatures of Borderline Tuberculoid Leprosy (40X Objective, H & E)

Table 3: Clinico-Histopathological correlation

Clinical diagnosis		Histopathological diagnosis						Aggregate percentage
		TT	BT	BB	BL	LL	IL	
	No of cases	7	18	1	10	5	9	
TT	4	4 (100%)	0	0	0	0	0	**100%**
BT	23	2 (8.7%)	13 (56.52%)	0	4 (17.4%)	1 (4.35%)	3 (13.04%)	**56.52%**
BB	2	1 (50%)	0	1 (50%)	0	0	0	**50%**
BL	6	0	1 (16.67%)	0	4 (66.67%)	0	1 (16.67%)	**66.67%**
LL	8	0	2 (25%)	0	2 (25%)	4 (50%)	0	**50%**
IL	7	0	2 (28.57%)	0	0	0	5 (71.43%)	**71.43%**

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

Table 4: Overall parity between clinical & histopathological types

Overall parity between Clinical & Histopathological Types	No of cases	Percentage
Parity	31	62%
Disparity	19	38%
Total	50	100%

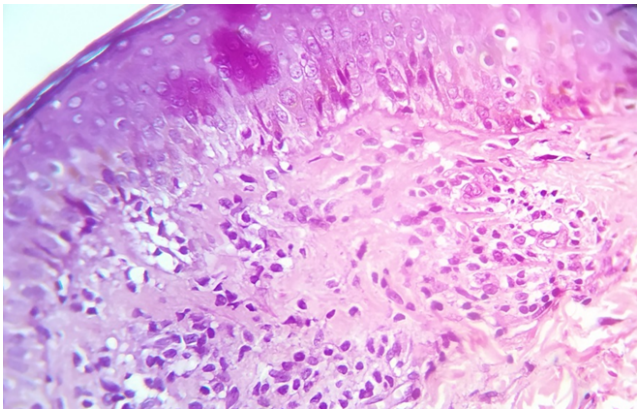

Fig. 3: Photomicrograph showing histopathologicalfeatures of Borderline Indeterminate Leprosy (40X Objective, H & E)

In our study of majority of cases 23(46%) were seen in age group of 21-40 years. Similar observations were made by Kaur I et al, Mathur MC et al and Maheswari K et al.[11,12] Male to Female ratio in our study is 1.63:1, and similar observations were made in other studies.[11–15] Loss of sensation was seen in 42(82%) cases in our study. Similar finding was ob served in studies by Gadigi S et al[16] and Kar P K et al.[17]In study done by Gill A L et al[18] only 40% cases presented with loss sensation which is much lower than present study. In our study 38(76%) cases presented with hypopigmented patches. Similar observation was made by Giridhar M et al[13] In study done by Gill A L et al much less(30%) patients presented with hypopigmented patches.[18] In our study 12(24%) cases presented with erythematous patches. Giridhar M et al[13] also made similar observation. While Gadigi S et al[16] found more number of cases presenting with erythematous patches in their study. In our study nerve thickening was seen in 31(62%) cases. Similar observation was made by Gadigi S et al,[16] Gill A L et al[18] and Kumar A et al.[19]

In our study most common histopathological type was BT with 18(36%) cases followed by BL with 10(20%) cases, IL and TT showed 9(18%) and 7(14%) cases respectively, least common type was BB with 1(2%) case. Majority of the cases(58%) were seen in borderline group which included BT,BB and BL, this was similar with the observations made in other studies.[13,14,20–22]

In our study 5 cases of TT were clinically diagnosed and all 5(100%) correlated histopathologically. Similar high correlation was noted in other studies.[13,21] In BT type 23 cases were clinically diagnosed out of them 13(56.52%) correlated histopathologically. In remaining 10 cases, 2(8.7%) were TT, 4(17.4%) were BL, 1(4.35%) was LL and 3(13.04%) were IL. Similar finding was seen in other studies.[20,21] In BB type 2 cases were clinically diagnosed out of them 1(50%) correlated histopathologically and remaining 1(50%) case was diagnosed as TT. Similar finding was seen in other studies.[14,22]In BL type 6 cases were clinically diagnosed out of them 4(66.7%) cases correlated histopathologically. In remaining 2 cases 1(16.67%) was BT and 1(16.67%) was IL. Similar finding was seen in other studies.[14,20,22] In LL type 8 cases were clinically diagnosed out of them 4(50%) cases correlated histopathologically. In remaining 4 cases, 2(25%) were BT and 2(25%) were BL. Other studies showed higher degree of correlation.[13,14,20–22] In IL type 7 cases were clinically diagnosed out of them 5(71.43%) cases correlated histopathologically. The remaining 2(28.57%) cases were BT. Similar finding was noted in other study.[21] In total 50 cases the diagnosis of 31(62%) cases correlated clinically and histopathologically.

5. Conclusion

The clinical and histopathological disparity was expected as parameters of histopathologic classification are precise and consider immunologic response of the tissue, whereas clinical classification considers only gross appearances of the lesions. Borderline leprosy cases (BT+BB+BL) are in a changing immunological spectrum and histopathologic classification identifies any recent shift of a case in the spectrum.

There is overlapping in various types of leprosy to some extent, especially in unstable forms (BT+BB+BL). In such situations better correlation is possible by considering both clinical and histopathological features.

Skin biopsies should be obtained from representative lesions in all cases to confirm clinical diagnosis and to classify the leprosy which plays important role in guiding the therapy.

6. Conflict of interest

None

7. Source of funding

None

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