International Journal of Health Sciences and Research
www.ijhsr.org ISSN: 2249-9571

Original Research Article

A Prospective Study of Clinico-Histopathological Correlation among Leprosy Patients Attending a Tertiary Referral Centre in Assam, in This Post Elimination Era

Dr. Debeeka Hazarika[1], Dr Manoj Karbhari Pawar[2], Dr. Ena Dowerah[3]

[1]Prof. Dermatology, [3]Prof. Pathology,
Department of Dermatology & Venereology, Gauhati Medical College and Hospital, Guwahati, Assam - 781032 India
[2]Asst. Prof. Dermatology, MVP'S D.V.P Medical College, Nashik, India.

Corresponding Author: Dr. Debeeka Hazarika

ABSTRACT

Background: Leprosy, also known as Hansen's disease, is a chronic, infectious and treatable disease that primarily affects the skin and the peripheral nerves. Clinico-histopathological correlation of leprosy case assumes a pivotal role in early diagnosis and proper labeling of a case and thus leads to better management of patients.
Aim: To study the clinical and histopathological correlation among leprosy patients attending a tertiary referral centre in this post elimination era.
Materials & Methods: Study was conducted at a tertiary hospital during July, 2014 to June, 2015. Total 72 new cases of leprosy were selected purely on clinical ground (WHO criteria) attending dermatology OPD. Then these patients were subjected to slit skin smear examination and skin biopsy. Histopathological classifications of sections were done on the basis of the scheme put forth by Ridley (1974) and later it was correlated with the clinical classification across the Ridley-Jopling spectrum to evaluate the concordance among two.
Results: Both clinically and histopathologically, BT constituted the predominant group 52.80% and 41.66% respectively. The overall clinico-histopathological correlation was seen in 41 cases (56.94%). Maximal concordance was noted in indeterminate leprosy (100%), followed by polar forms of leprosy i.e. LL (80%) & TT (75%). The least concordance was seen in mid-borderline leprosy (16.66%).
Conclusion: This study highlights the importance of histopathological examination in assessing the leprosy cases as the under-treatment of MB cases will lead to persisters in the community and thus spread of disease and possible danger of drug resistance too in this era of elimination.

Key words: Leprosy, Clinico-histopathological correlation, Ridley-Jopling criterion.

INTRODUCTION

Leprosy is the oldest, dreaded, infectious but treatable disease; caused by Mycobacterium leprae. (1) Because of the sequelae of leprosy i.e. physical disabilities and deformities, it carries social stigma and ostracism; not only to patient but also to their family leading to so called patient's "death before death".

Although leprosy has been eliminated in 2005 and its prevalence is decreased, the annual no of new cases diagnosed (NCDR= 1.25 lakh) remains stable. World's maximum no of leprosy cases i.e. 58.84% are from India, thus

posing an important public health problem in India. Children cases only, accounts for 9.04%, indicating active transmission of leprosy. [(2)]

Clinical diversity of leprosy, its ability to mimic other diseases leads to its lowered index of suspicion & delayed diagnosis and thus increasing in the no. of multibacillary (MB) cases, incidence and disability.

A reliable diagnosis of leprosy hinges around detailed examination of skin lesion, peripheral nerves, demonstration of AFB in slit skin smears by Z-N staining and a good histopathological diagnosis along with demonstration of bacilli in it. [(3)]

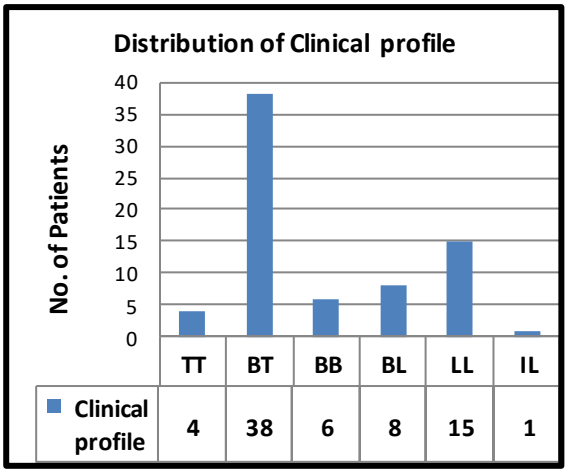
No of studies have attempted to correlate clinical picture of leprosy with its corresponding histological classification. Great variation amongst various researchers (interpretation of clinical and histopathological observations) i.e. ranging from 35 to 43%, prompted us to undertake this study. [(4-10)]

MATERIALS & METHODS

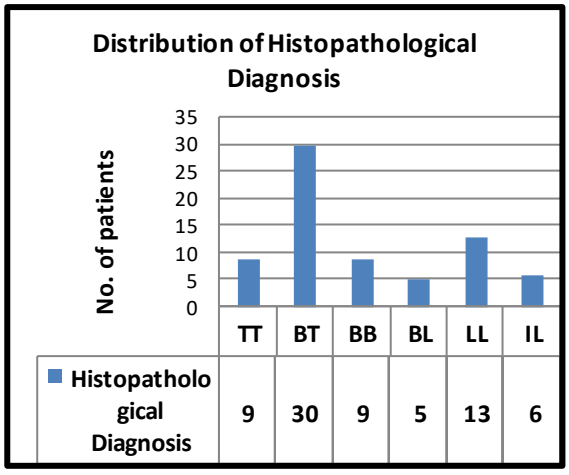
A hospital based, prospective and interventional study was carried out at the department of dermatology, venereology & leprosy, Gauhati medical college, Guwahati, Assam; which is a tertiary referral centre in the North-east region. Seventy two (72) newly diagnosed cases of leprosy, which later subjected to skin biopsy (taken from active skin lesion) for histopathological examination over a period of one year from July, 2014 to June, 2015 were included in the study after obtaining written consent from each patient and ethical clearance from the said institute. Patient who has taken anti leprosy treatment in the past/old cases or who is on anti-leprosy treatment and those who are in reaction state were excluded from the study. All new leprosy patients were clinically evaluated and diagnosed as per the WHO criteria. [(11)] Histopathological classification done on the basis of the scheme put forth by Ridley (1974) and it was correlated with the clinical classification across the Ridley-Jopling spectrum to evaluate the concordance among two. [(12, 13)]

RESULTS

Patients of both sexes were affected with predominance of males (79%) with a male to female ratio of 3.8:1. Maximum incidence of leprosy was seen in the age group of 20-29 yrs (29.16%). The highest age of onset noted was 65 year old male and lowest was 5 year old male. Both clinically and histopathologically, BT constituted the predominant group 52.80% and 41.66% respectively, followed by LL which showed clinical diagnosis in 20.83% and histopathological diagnosis in 18.05% patients (Graph A & B).



Graph A: Distribution of clinical profile



Graph B: Distribution of histopathological profile.

The overall clinico-histopathological correlation was noted in 41 cases, (56.94%) out of the total 72 cases. Maximal concordance was noted in indeterminate leprosy (100%), followed by polar types i.e. LL (80%) and TT (75%). The least concordance was found in mid-borderline leprosy (16.66%) followed by BL (37.5%) (Table 1)

Table 1: Concordance pattern across the Ridley-Jopling spectrum

Clinical diagnosis	Clinically diagnosed cases	Histopathological diagnosis						Concordance (%)
		TT	BT	BB	BL	LL	IL	
TT	04	03	01	-	-	-	-	75
BT	38	06	21	06	-	-	05	55.26
BB	06	01	04	01	-	-	-	16.66
BL	08	-	02	01	03	01	-	37.5
LL	15	-	01	01	02	12	-	80
IL	01	-	-	-	-	-	01	100
Total	72	10	29	09	05	13	06	56.94

The discordance was noted in 31 cases (43.05%) out of the 72 cases. The majority cases i.e. n=17 belonged to borderline tuberculoid group.

DISCUSSION

Leprosy is exclusively a disease of human and only source of infection is a patient of leprosy. It is an important public health problem in our country, with Uttar Pradesh, Bihar, Maharashtra and West Bengal being the states with the highest number of cases. (NLEP – Monthly Progress card for the year 2014-15). [2] Timely and accurate diagnosis is the corner stone of leprosy control, as it is helpful in case management, preventing transmission of disease and thus deformity. Hence, it is imperative to have in-depth knowledge and clarity regarding the diagnosis and classification of leprosy cases especially at the field level.

Disease occurrence in leprosy is often related to age at detection rather than age at onset of disease. It is known to occur at all ages ranging from early infancy to very old age. Of the 72 patients in the present study, 21 (29.16%) patients with age group of 20-29 years (3rd decade) were affected most and extremes of age (0-9 yrs and 61-70 yrs) were affected least. Similar observations were made by other authors also. [14,15] Recently Kumar A et al (2014) found the incidence of leprosy highest in young adult aged 21-30 years (23.87%). [6] (Table 2)

Table 2: A comparative study of age distribution by other authors with present study.

Age in years	Moorthy N. et al [14] (2001)	Kaur et al [19] (2003)	Mathur et al [15] (2011)	Kumar et al [6] (2014)	Present study (2015)
O-9	6.45%	0.2%	0.69%	1.41%	5.55%
10-19	20.43%	10.4%	11.88%	10.16%	8.33%
20-29	20.69%	17.2%	30.77%	23.87%	29.16%
30-39	16.93%	30.8%	19.58%	23.16%	22.22%
40-49	15.86%	18.2%	21.67%	13.71%	23.61%
>50	19.61%	23.2%	15.38%	27.65%	11.11%

The present study noted 5.55% of the subjects in the age group of 0-9 year. The percentage of new child leprosy cases at national level is 9.04%, whereas in Assam state it is 7.01% (NLEP – Monthly progress report card for the year 2014-15) and it has been reflected in our study also. This signifies the diminished transmission and declining disease burden in the region.

The clinical profile of patients in the present study showed the majority of the patients i.e. 52 (72.22%) found to be in the borderline spectrum of leprosy. Similar predominance of cases in borderline group was noted by Kumar A et al (2014), [6] S

Bajjaragi et al (2012), [4] Nadia et al (2015). [7] (Table 3)

Table 3: Comparative analysis of clinical spectrum with other studies.

Authors	Clinical profile in percentage (%)					
	TT	BT	BB	BL	LL	IL
Bajjaragi et al (2012) [4]	9.3	47.9	3.5	20.5	15.2	3.5
N Mohan et al (2013) [5]	7.89	45.26	2.12	13.68	23.68	7.37
Raveneet B et al (2014) [20]	28.33	36.66	11.66	6.66	8.33	8.33
Kumar A et al (2014) [6]	19.41	17.05	21.76	17.94	14.70	9.11
K L Shobha et al (2015) [9]	14	42	9	10	14	11
Nadia S et al (2015) [7]	9.3	46.6	5.1	13.5	20.3	0.8
Present study (2015)	5.55	52.80	8.33	11.11	20.83	1.38

The highest rate of concordance was observed in indeterminate leprosy which is 100% i.e. one out of one patient showed parity between clinical and histopathological finding. This finding conforms studies done by Shrama A et al (2008) [8] and Kansagara M H et al (2012). [10] But in contrary to our result, studies done by Mathur MC et al, [15] Shivaswamy KN et al, [16] Bijjaragi S et al, [4] Giridhar M et al [17] and Manandhar U et al [18] showed highest clinico-histopathologic correlation in LL subtype of leprosy, 95.2 %, 84.2%, 93.8%, 76.2% and 57.1% respectively. (Table 4)

Table 4: Comparative study of concordance pattern across Ridley-Jopling spectrum with various other studies

Subtype of leprosy	Mathur MC et al (2011) [15]	Kansagara et al (2012) [10]	Bijjaragi et al (2012) [4]	Kumar A et al (2014) [6]	Nitesh Mohan et al (2013) [5]	Nadia et al (2015) [7]	Present study
TT	73.2%	100%	75%	81.8%	71.43%	72.7%	75%
BT	89.7%	59.1%	57.3%	34.5%	79.76%	65.4%	55.26%
BB	64.7%	-	16.7%	54.1%	66.67%	50.0%	16.66%
BL	72.4%	62.5%	40%	21.3%	66.67%	18.7%	37.5%
LL	95.2%	54.6%	76.9%	64.3%	97.22%	79.2%	80%
IL	-	100%	66.7%	93.6%	50.00%	-	100%
Overall	68.3%	66%	57.3%	62.9%	56.54%	61.8%	56.94%

The present study showed an overall clinico-histopathological concordance of 56.94% with 41 out of the total 72 cases showing parity between the clinical and histopathological diagnosis. The various similar concordance rates noted in various other studies as shown in Table 5.

Table 5: Comparative analysis of clinicohistopathological correlation with other studies.

Authors	Number of cases	Overall parity %
Sharma A (2008) [8]	270	53.44
M Giridhar et al (2012) [17]	100	60.23
Nitesh Mohan et al (2013) [5]	190	56.54
Kumar A et al (2014) [6]	423	62.9
Nadia et al (2015) [7]	118	61.8
K L Shobha et al (2015) [9]	100	65
Present study (2015)	72	56.94

The discordance between clinical and histopathological diagnosis was noticed because the clinical examination only reflects the gross morphology of the lesions caused by the underlying pathology; whereas the specific histopathologic features in leprosy which are well defined and precise and indicate the accurate response of the tissue, while taking into account the immunologic manifestations. Since there is variable tissue response in the disease spectrum due to the variability of CMI, it is logical to expect disparity between the clinical and histopathological features while studying various types of leprosy, which is evident in our study.

There are various factors which influence the histopathological diagnosis such as different criteria used to select the cases, number of cases of each type, duration of the lesion, immunological and treatment status of the patient at the time of diagnosis, occurrence of reaction, nature and depth of the biopsy, quality of the section and number of acid-fast stained sections examined. (21) Selection of the site for biopsy plays an important role in histopathological diagnosis since clinically different lesions biopsied from same patient can show different types of histopathology. There is also inter observer variation both

clinically and histopathologically, so there could be overlap between different types of leprosy. (Bhatia et al). [(22)]

CONCLUSION

Many cases of leprosy can be diagnosed clinically esp. of polar forms. However, other forms of leprosy mainly borderline, pose a diagnostic dilemma in developing countries; where advanced diagnostic facilities are still lacking and slit skin smear is still being used for categorization of disease, which can lead to not only poor but also false negative diagnosis due to lack of expertization.

Implications of the study:

Hence, the histopathological examination should be carried out in all cases if feasible, for exact allocation of the patient across the spectrum. This will not only facilitate the accurate treatment but will also identify the vulnerable patients in borderline spectrum who are prone for reactions, neuritis and thus deformities. All these will help for better assessment and proper treatment and thus prognosis, thereby aiding in achieving terminal goal of leprosy elimination.

Limitations of the study:

Small sample size is the main limitation of our study. Also, sizable proportion of our patients belonged to borderline group i.e. BT+BB+BL; which is a continuously changing immunological spectrum, hence it was imperative to assess immune status of the patients, but it could not be done due to lack of diagnostic facilities.

To conclude, In-depth studies with large sample sizes are required to reassess the criteria, giving weightage to the different clinical signs and histopathological parameters considering immune status, in relation to the diagnosis of the different types of leprosy.

REFERENCES

1. Lowe J. Comments on the history of Leprosy. Lepr Rev 1947; 18: p. 54-63.
2. NLEP – Monthly Progress card for the year 2014-15.
3. Jopling WH, Mcdougall AC. Diagnostic Tests, In: Hand book of leprosy, 5th edn. CBS. 1999. pp.60.
4. Bijjaragi S,V Kulkarni , KK Suresh , P Kumar, Correlation of clinical and histopathological classification of Leprosy in post elimination era, Indian J Lepr. 84:271-275: 2012.
5. Nitesh Mohan, Nitish Mishra, Clinico histopathological correlation within the spectrum of hansen's disease: A multicentric study in north India. Int J Med Res Health Sci. 2013; 2(4):887-892.
6. Ankur Kumar, S. R. Negi, Kusum Vaishnav, A study of Clinico-histopathological correlation of leprosy in a tertiary care hospital in western district of Rajasthan. Journal of Research in Medical and Dental Science, Vol. 2, Issue 3, July – September 2014.
7. Nadia S, Jindal R, Ahmad S, Rawat SDS, Selvi Thamarai N, Harsh Meena, clinico pathological correlation of leprosy: a 4 years retrospective study from a tertiary referral centre in north india int j med res health sci. 2015;4(2):350-354.
8. Anuja Sharma, Rajesh Kumar Sharma, K C Goswsami, Subash Bardwaj. Clinico-Histopathological Correlation in Leprosy, JK Science, Vol. 10 No.3, Julyl-September 2008.
9. K L Shobha, C J Prakash, Clinico-Histopathological Study of Leprosy. International Journal of Scientific Study, April 2015, Vol 3, Issue 1.
10. Kansagara MH. A Clinico-Histopathological Correlative Study (unpublished Doctoral dissertation) Rajiv Gandhi University of Health Sciences, 2012.
11. Gupte MD, Manickam P. Leprosy: Epidemiology. 3rd ed. In: IADVL Textbook of Dermatology, Valia RG, Valia AR, eds. Mumbai: Bhalani Publishers; 2008.pp. 1994-2004.
12. Ridley DS and Jopling WH (1966). Classification of leprosy according to immunity. A five group system. Int J Lepr . 34: 255-273.
13. Ridley DS (1974). Histological classification and immunological spectrum of leprosy. Bull WHO. 51: 451-464.
14. Moorthy BN, Prakash Kumar, KR Chatura, HR Chandrasekhar, PK

Basavaraja. Histopathological correlation of skin biopsies in leprosy, Indian Dermatol Venereol Leprol. 2001; 67(6): 299-301.
15. Mathur MC, Ghimire RBK, Shrestha P, Kedia SK. Clinicohistopathological Correlation in Leprosy. Kathmandu Univ Med J 2011; 36(4).p.248-51.
16. K N Shivaswamy, A L Shyamprasad , T K Sumathy, C Ranganathan , Vidushi Agarwal. Clinico histopathological correlation in leprosy, Dermatology Online Journal 18 (9): 2012.
17. Giridhar M, Arora G, Lajpal K, Singh Chahal K. Indian J Lepr. Clinicohistopathological concordance in Leprosy - A Clinical, Histopathological and Bacteriological study of 100 cases2012 Jul-Sep;84(3):217
18. Manandhar U, Adhikari RC, Sayami G: Clinico-Histopathological Correlation Of Skin Biopsies In Leprosy. Journal of Pathology of Nepal. 2013; 3: 452-8.
19. Kaur I, Indira D, Dogra S, Sharma VK, Das A, Kumar B. Relatively spared Zones in leprosy: A clinicopathological study of 500 patients. Int J Lepr 2003; 71 (3).p 227-229.
20. Raveneet Badhan, Ramesh Kumar Kundal, Rakesh Tilak Raj, Rakesh Kumar Bahl, Manjeet Singh Bal. A Clinico-Pathological Correlation Study of Leprosy in a Tertiary Care Teaching Institute in Northwest Punjab, India.
21. Chacko, C.J.G, Role of histopathology in early diagnosis of leprosy, Indian J Lepr, 65. 23-27. 1993.
American Journal of Medical Sciences and Medicine, 2014 2 (5), pp 99-108.
22. Bhatia AS, Katoch K, Narayanan RB, Ramu G, Mukherjee A, Lavania RK. Clinical and histopathological correlation in the classification of leprosy. Int J Lepr 1993; 61:433-8.

How to cite this article: Hazarika D, Pawar MK, Dowerah E. A prospective study of clinico-histopathological correlation among leprosy patients attending a tertiary referral centre in Assam, in this post elimination era. Int J Health Sci Res. 2017; 7(4):148-153.

****