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Leprosy in posteradication era – A clinicopathological correlation: How far we have achieved?

Deepti Gangwar[1], Amitosh Mishra[2], Sara Siddiqui[3], Sangeeta Bohara[4], Bushra Khanam[5]

[1]Assistant Professor, [5]Tutor, Department of Pathology, [2]Assistant Professor, Department of Orthopedics, [3]Assistant Professor, Department of Physiology, Integral Institute of Medical Science and Research, [4]Professor, Department of Pathology, Hind Institute of Medical Sciences, Lucknow, Uttar Pradesh, India

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ABSTRACT

Background: Leprosy or "Hansen Disease" is chronic inflammatory disease caused by Mycobacterium leprae. This disease is the oldest disease known to mankind. Leprosy is also known as "Kushtaroga.". Leprosy was considered as an eradicated disease in 2005 but still a large number of leprosy cases are being reported in India. **Aims and Objectives:** The aim of the study was to demonstrate that leprosy even being eradicated continuous to be a major health concern with changing trends. **Materials and Methods:** This study is a a hospital-based crossectional study; it involves all new patients of leprosy attending dermatology O.P.D HIMS, Safedabad, Barabanki, U.P. from 2015 to 2016. The cases were classified as per Ridley – jopling classification. Skin biopsies were taken from all clinically suspected cases of leprosy and these biopsies were studied using H&E stain. **Results:** In our study, 53 leprosy cases were registered from April 2015 to April 2016. According to demographic details of leprosy cases, maximum number of cases were in the age group 31–40 years 38.9% and in individuals <20 years 10.5%. Majority of cases were males (11.3%). The family history of leprosy was present in 9.4% of patients. Hypopigmented lesion on skin was most common symptom (32.1%). TT was most common clinical diagnosis (26.4%). IL was common histopathological diagnosis (26.4%). Atrophy of epidermis was seen in 50.9% of patients. Paucibacillary was seen in 62.3% of patients. Most of the cases were from Safedabad. **Conclusion:** Leprosy although reported to be eradicated still continues to be one of the common communicable disease in Uttar Pradesh, India. This necessitates to strengthen screening of cases, early detection, and revival of our knowledge regarding the disease.

Key words: Leprosy; Post-eradication; Biopsies

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INTRODUCTION

Leprosy was considered to be a major health problem, it is now reported as eliminated by World Health Organization from majority of countries where it was considered to be endemic (<1 cases/10,000 population).[1] India achieved its target of leprosy elimination in 2005.[2] In South-east Asian countries, prevalence rate of leprosy is 0.63/10,000, in India, it is 0.68/10,000 population.[3] In India during the year 2012–2013, newly diagnosed cases of leprosy were 13,387 (81.9%), 10% of these cases were children below the age of 15 years.[4]

Leprosy among all the communicable disease is important because it can cause physical impairment and physical disability. Deformities caused by leprosy can lead to social discrimination; leprosy is considered to be a social stigma, it also effects the physical and mental health of the patient. People suffering from leprosy are kept in isolation by family members and society due to its communicable nature.[5]

Aims and objectives

The aim was to study the clinicopathological correlation of all suspected cases of Hansen's disease.

Address for Correspondence:
Dr. Deepti Gangwar, Assistant Professor, Department of Pathology, Integral Institute of Medical Science and Research, Lucknow - 226 026, Uttar Pradesh, India. **Mobile:** 6394370453. **E-mail:** deeptig0309@gmail.com

1. To study clinicopathological correlation in cases of leprosy.
2. To classify cases of leprosy according to Ridley-Jopling classification.

MATERIALS AND METHODS

The present study is a hospital-based crossectional study, conducted from 2015 to 2016. The data was collected from HIMS, Safedabad, Barabanki, U.P. All the newly diagnosed cases were included in the study. Data were analyzed using SPSS 16.0 version. Demographic variables such as sex, age, and family history were included in the study. Other data such as skin lesion, clinical presentation, and pathological diagnosis were also included in the study. Ethical committee clearance was taken (IEC/IRB No: HIMS/IRB/2015/752).

RESULTS

In our study, 53 cases were registered from April 2015 to April 2016. Demographic profile is depicted in Table 1. Majority of the cases were males as compared to females, paucibacillary cases were 62.3%, childhood leprosy was reported in 10.5%, family history was present in 9.4%. Clinically, tuberculoid leprosy was the most common form of leprosy and histopathological diagnoses showed indeterminate leprosy as most common form of leprosy. Hypopigmented patch was the most common presentation.

Table 1 shows that 34 (64.1%) patients were males; the age group 20–50 was studied and it was seen that maximum number of cases were seen in 31–40 years (39.6%), followed by 20–30 year age group that is 10 cases (18.9%).

Table 2 – 17 (32.1%) patients showed hypopigmented skin lesions; clinically, loss of sensation was seen in 10 (18.9%) patients, nerve thickening and erythematous skin lesions were seen in 9 (17.0%), nodules and tropic ulcers were seen in 2 (3.8%) cases. There was combination of lesions seen 4 (7.5%) cases.

Table 1: Distribution of patients according to demographic profile

Age in years	Number (53)	Percentage
<20	6	10.3
20–30	10	18.9
31–40	21	39.6
41–50	9	17.0
>50	7	13.2
Gender		
Male	34	64.1
Female	19	35.8

Table 3 showed that tuberculoid leprosy was the most common clinical diagnosis seen in patient, out of 53 cases 14 (26.4%) were diagnosed as tuberculoid leprosy and borderline leprosy was diagnosed in 9 (17.0%) cases.

Table 4 shows distribution of patients according to histopathological diagnosis of leprosy. IL was the most common histopathological diagnosis 14 (26.4%), TT-4 (7.5%), LL-11 (20.8%), BB-7 (13.2%), and BL-5 (9.4%).

Table 5 – Epidermis of the leprosy patients showed atrophy in skin biopsy of 27 (50.9%) patients, ulceration was present in 8 (15.1%), basement membrane erosion

Table 2: Distribution of patients according to clinical symptoms

Clinical Symptoms	Number (n=53)	Percentage
Anesthesia (loss of sensation)	10	18.9
Hypopigmented skin lesions	17	32.1
Nerve thickening	9	17.0
Erythematous skin lesions	9	17.0
Combination of lesions	4	7.5
Nodules	2	3.8
Trophic ulcers	2	3.8

Table 3: Distribution of patients according to clinical diagnosis of leprosy

Clinical diagnosis	Number (n=53)	Percentage
TT	14	26.4
BT	9	17.0
BB	6	11.3
BL	5	9.4
IL	7	13.2
LL	12	22.6

TT: Tuberculoid leprosy, BT: Borderline tuberculoid leprosy, BB: Borderline borderline, BL: Borderline lepromatous lepory, LL: Lepromatous leprosy

Table 4: Distribution of patients according to histopathological diagnosis of leprosy

Histopathological diagnosis	Number(n=53)	Percentage
TT	4	7.5
BT	12	22.6
BB	7	13.2
BL	5	9.4
IL	14	26.4
LL	11	20.8

TT: Tuberculoid leprosy, BT: Borderline tuberculoid leprosy, BB: Borderline borderline, BL: Borderline lepromatous lepory, LL: Lepromatous leprosy

Table 5: Distribution of patients according to histopathological epidermis changes in leprosy

Epidermis	Number (n=53)	Percentage
Atrophy	27	50.9
Ulceration	8	15.1
Unremarkable	11	20.8
Basement membrane erosion	7	13.2

was seen in 7 (13.2%), and unremarkable epidermis was seen in 11 (20.8%).

Table 6 – Epitheloid granuloma was seen in 11 (20.8%), giant cells in 10 (18.9%) biopsies, perivascular lymphocytes 9 (17.0%), perineural lymphocytes 7 (13.2%), periappendageal lymphohistiocytes 3 (5.7%), and grenz zone 5 (9.4%).

Distribution of cases of leprosy showed that the most common age group of leprosy was 31–40, epidermal atrophy was seen in 27 cases. Epitheloid granuloma was seen in 11, giant cells were seen in 10 cases, hypopigmented lesion was most common lesion. Tuberculoid leprosy was the most common clinical diagnosis. Fite stain showed lepra bacilli BI ranging from 3–5, in some cases no bacilli was seen. In some cases of indeterminate leprosy, lepra bacilli were not seen but diagnosis was only clinical and on the basis of histopathology.

DISCUSSION

Leprosy control now is focused on detection of new cases and provision of treatment to newly detected cases so as to break the chain of transmission.[6] Due to the implementation of drug regimen, the prevalence rate of leprosy has reduced to 0.66/10,000 in 2016.[7] Global leprosy strategy was launched in 2016–2020 by the World Health Organization in April 2016 with aim of leprosy free world The study conducted was hospital based crossectional study. Data were collected from HIMS Safedabad, Barabanki in period of 1 year April 2015–April 2016, maximum number of cases was between age group of 31–40 years comparable with study by Thakkar and Patel.[8] The male to female ratio was 0.1–0.8, it was compatible with the studies Thakkar and Patel.[8] Positive family history/contact history 9.4% was comparable with Salodkar and Kalla.[9]

In the present study, hypopigmented skin lesion (Figures 1 and 2) was the most common clinical symptom 32.1% comparable with the study by Moorthy et al.[10] Atrophy (Figure 3) of epidermis was found in 50.9% patients also reported by Suneeta et al., Paucibacillary (Figure 4) was found in 62.3% similar to Suri et al.[11]

Table 6: Distribution of patients according to histological dermal changes in leprosy

Dermal changes	Number (n=53)	Percentage
Epitheloid granuloma	11	20.8
Giant cells	10	18.9
Periappendageal lymphocytes	8	15.1
Perivascular lymphocytes	9	17.0
Perineural lymphocytes	7	13.2
Periappendageal lymphohistiocytes	3	5.7
Grenz zone	5	9.4

Clinical spectrum of leprosy cases in the present study revealed that TT (Figures 5 and 6) was most common clinical diagnosis, similar observation was given by Shenoi and Siddappa.[12] In this study, histopathological findings

Figure 1: Photomicrograph showing hypopigmented macular lesions distributed on foot

Figure 2: Photomicrograph showing hypopigmented patches on face

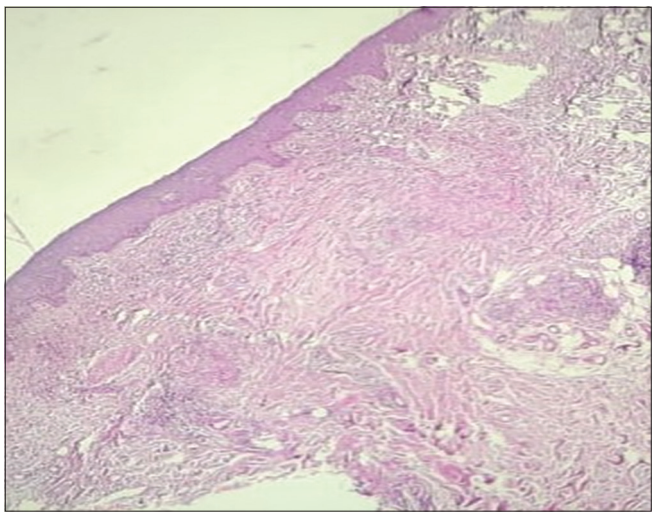

Figure 3: Photomicrograph showing thinned out epidermis (H and E) showing perineural lymphocytic infiltration

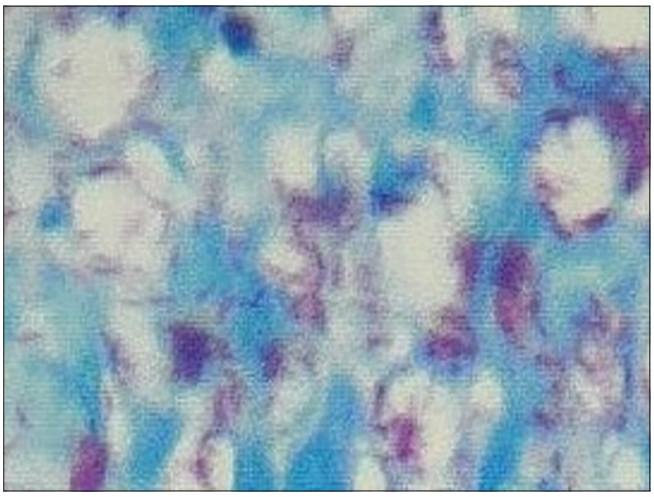

Figure 4: Photomicrograph showing acid fast bacilli in Fite-faraco staining (Fite-faraco ×1000)

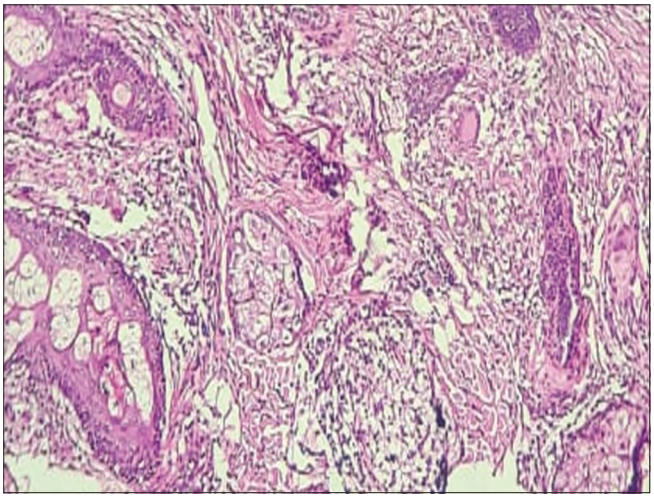

Figure 5: Photomicrograph showing tuberculoid leprosy showing langhans giant cells inflammatory infiltrate involving papillary dermis

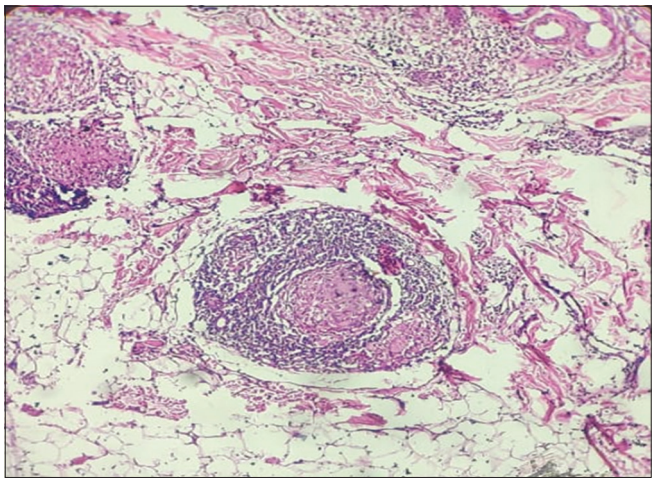

Figure 6: Photomicrograph showing tuberculoid leprosy showing langhans giant cells, macrophage and lymphocytes

Figure 7: Photomicrograph showing hypopigmented erythematous lesion all over face

revealed IL as most common histopathological diagnosis 26.4%. Bhatia et al.,[13] observed that if biopsy was taken in early stage of leprosy then chances of clinical and histopathological observation was high.

Clinical diagnosis (Figure 7) of early leprosy lesion offers difficulties even to experienced dermatologist. A definitive diagnosis may be possible by histopathological examination. Histopathological features indicate the accurate response of tissue, while the clinical features indicate only gross morphology of lesions which is due to underlying pathological changes.

The study was conducted with the objective to study spectrum of leprosy with histopathological confirmation.

Numerous control and preventive programs are being implemented in India. These include national leprosy control program, modified leprosy elimination campaign, and rural health mission. Integration of leprosy services with the general care system to cover the population, trained leprosy workers at peripheral level, regular surveillance of new cases at community level, improving the quality of services, improving community awareness, and implementation of preventive and control measures will further strengthen leprosy eradication programs. An accredited social health activist (ASHA) plays an important role in national rural health mission. The ASHA is a female health activist of village and she can be used to reach female leprosy patients.[14]

Limitations of the study

Sample size was small. Another study with large sample size and longer duration may further help in establishing situation of leprosy in the present scenario. The study was conducted in tertiary care hospital, it is not representative of general picture of current leprosy trends in the region.

CONCLUSION

Leprosy despite being eliminated continues to be a communicable disease of concern in post-eradication era. This necessitates the need to strengthen contact screening, early detection, referral activities and revival of our knowledge regarding the disease.

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REFERENCES

1. World Health Organization. Global leprosy situation, 2012. Wkly Epidemiol Rec. 2012;87(34):317-328.
2. Dhillon GP. NLEP--current situation and strategy during the 11th plan period (2007-2012). J Indian Med Assoc. 2006;104(12):671-672.
3. Kumar B. World leprosy day 2015: Renewing commitment for a leprosy free world!. Indian J Med Res. 2015;141(1):1-4.
   https://doi.org/10.4103/0971-5916.154476
4. Dogra S, Narang T, Khullar G, Kumar R and Saikia UN. Childhood leprosy through the post-leprosy-elimination era: A retrospective analysis of epidemiological and clinical characteristics of disease over eleven years from a tertiary care hospital in North India. Lepr Rev. 2014;85(4):296-310.
   https://doi.org/10.47276/lr.85.4.296
5. Obregón D. The anti-leprosy campaign in Colombia: The rhetoric of hygiene and science, 1920-1940. Hist Ciênc Saúde Manguinhos. 2003;10(Suppl 1):179-207.
   https://doi.org/10.1590/s0104-59702003000400009
6. Rizvi AA, Sharma YK, Dash K, Tyagi N, Yadava R and Sadana D. An epidemiological and clinico-histopathological study of leprosy in semi-urban area under Pimpri Chinchwad municipal corporation in Pune district of Maharashtra. Med J DY Patil Univ. 2015;8(5):609-613.
   https://doi.org/10.4103/0975-2870.164979
7. Rao PN and Suneetha S. Current situation of leprosy in India and its future implications. Indian Dermatol Online J. 2018;9(2):83-89.
   https://doi.org/10.4103/idoj.IDOJ_282_17
8. Thakkar S and Patel SV. Clinical profile of leprosy patients: A prospective study. Indian J Dermatol. 2014;59(2):158-162.
   https://doi.org/10.4103/0019-5154.127676
9. Salodkar AD and Kalla G. A clinico-epidemiological study of leprosy in arid North-West Rajasthan, Jodhpur. Indian J Lepr. 1995;67(2):161-166.
10. Moorthy BN, Kumar P, Chatura KR, Chandrasekhar HR and Basavaraja PK. Histopathological correlation of skin biopsies in leprosy. Indian J Dermatol Venereol Leprol. 2001;67(6):299-301.
11. Suri SK, Iyer RR, Patel DU, Bandil S and Baxi S. Histopathology and clinicohistopathological correlation in Hansen's disease. J Res Med Den Sci. 2014;2(1):37-44.
12. Shenoi SD and Siddappa K. Correlation of clinical and histopathologic features in untreated macular lesions of leprosy--a study of 100 cases. Indian J Lepr. 1988;60(2):202-206.
13. Bhatia AS, Katoch K, Narayanan RB, Ramu G, Mukherjee A and Lavania RK. Clinical and histopathological correlation in the classification of leprosy. Int J Lepr Other Mycobact Dis. 1993;61(3):433-438.
14. Joshi P. National scenario, national leprosy eradication program (NLEP) and new paradigms. In: Kar HK and Kumar B, editors. IAL Textbook of Leprosy. 1st ed. New Delhi: Jaypee Brothers Medical Publishers; 2010. p. 35.

Author's Contribution:
DG- Concept and design of the study, literature search, data acquisition, interpreted the result, reviewed the literature, manuscript preparation, and prepared first draft of study; **AM, SS, SB, BK-** Concept, literature search, data analysis, manuscript editing, and manuscript review

Work attributed to:
Hind Institute of Medical Sciences, Safedabad, Barabanki - 225 003, Uttar Pradesh, India.

Orcid ID:
Dr. Deepti Gangwar - https://orcid.org/0000-0002-2918-1365
Dr. Amitosh Mishra - https://orcid.org/0000-0003-3393-9682
Dr. Sara Siddiqui - https://orcid.org/0000-0001-7085-5571
Dr. Sangeeta Bohara - https://orcid.org/0000-0002-7054-6805
Dr. Bushra Khanam - https://orcid.org/0000-0003-2644-6695

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