



**ORIGINAL RESEARCH PAPER**

**Dermatology**

**A STUDY ON CORRELATION BETWEEN TYPES OF LEPROA REACTIONS AND IT'S HISTOPATHOLOGICAL FINDINGS IN TERTIARY CARE HOSPITAL OF PATNA BIHAR ”**

**KEY WORDS:**

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**ABSTRACT**

**Introduction:** Leprosy is a disease dating back to ancient times before Christ. The most ancient writing are those of Charaka, Shushruta and Vanbhata. 'SHUSHRUTA SAMHITA' was compiled in about 600 B.C. In these ancient books, reference to leprosy are made at two separate places as Vat Rakta or Vat Shonita and as Kushtha. **Objective:** Analysis of association between types of lepra reactions and it's histopathological findings. **Materials and Methods:** Present study was carried out in patients attending the Out patient and Inpatient, Department of Skin & VD Patna Medical College & Hospital, Patna from December 2017 to August 2018. **Results:** Out of total 63 patients, 26 patients were of Type 1 reaction while 37 of Type 2 reaction. Among 26 type 1 reaction patients 21 were of Borderline Tuberculoid, 3 of Mid Borderline while 2 were of Borderline Lepromatous, thus BT patients had higher incidence of type 1 reaction and among 37 type 2 patients 23 were of lepromatous leprosy while rest 14 of borderline lepromatous. **Conclusion:** In the present study prevalence of type 2 lepra reaction was higher than type 1 lepra reaction. As majority of the patients had borderline leprosy which is the usual scenario, type 1 reaction was more among them. Similarly the higher incidence of type 2 reaction among LL patients is an established fact.

**INTRODUCTION**

Leprosy is a disease dating back to ancient times before Christ. The most ancient writing are those of Charaka, Shushruta and Vanbhata. 'SHUSHRUTA SAMHITA' was compiled in about 600 B.C. In these ancient books, reference to leprosy are made at two separate places as Vat Rakta or Vat Shonita and as Kushtha. Rastogi quote the sanskrit word Kushtha meaning "mouse eaten" as the original name for leprosy in India. The disease is generally believed to have been common in ancient Egypt. Leprosy is mentioned at several places in the Bible. In the old testament word 'Tsaraath' is used and in new testament, the word 'lepra' is used.<sup>1</sup>

Leprosy (Hansen's disease) is a chronic disease caused by Mycobacterium leprae, infectious in some cases, and affecting primarily the peripheral nervous system and then skin, and certain other tissues.<sup>2</sup> WHO Classification as modified under NLEP (2009).<sup>3</sup>

Characteristics	Paucibacillary	Multibacillary
Skin lesions	1-5 lesions (including single nerve lesion if present)	> 5 lesions
Peripheral nerves involmenet	No nerve/ only 1 nerve, with or without 1-5 lesions	>1 nerve irrespective of the number of lesions
Skin smears	Negative at all sites	Positive at any site

Leprosy reactions are immunologically mediated episodes of acute or subacute inflammation which interrupt the natural course of disease affecting the skin, nerves and others tissues. Reactional states are divided into two forms, called type 1 and type 2 reactions. **Type 1 reactions** are delayed hypersensitivity reaction associated with sudden alteration of cell-mediated immunity.<sup>4</sup> **Type 2 reaction (Erythema nodosum leprosum)** is an immune complex syndrome and occur in lepromatous patients (BL, LL). It is a type 3 hypersensitivity reaction.<sup>5</sup>

The **Lucio phenomenon** is a type of reaction observed in untreated, uniformly diffuse shiny infiltrative, non-nodular form of lepromatous leprosy, chiefly encountered in Mexico. This is associated with necrosis of arterioles whose endothelium is massively invaded by M. leprae. In histopathological feature there is ischemic epidermal

necrosis, necrotising vasculitis of small blood vessels in the upper dermis, severe focal endothelial proliferation of mid-dermal vessels, and by presence of large number of AFB in endothelial cells.<sup>6</sup>

**Correlation among the various classifications<sup>7</sup>**

Indeterminate leprosy technically falls outside the spectrum of the Ridley-Jopling classification and is included in paucibacillary type in the 1982 World Health Organisation system. In other system of classification (the Madrid, and the original Indian classification) it is recognised as such.

Tuberculoid leprosy falls under the paucibacillary and non lepromatous grouping of WHO and lepromatous vs. non-lepromatous systems respectively.<sup>8</sup>

Macular tuberculoid of the Madrid system roughly corresponds to maculoanesthetic in the Indian classification, TT or BT of the Ridley-Jopling and BT of the Job-Chacko classification. Both minor and major tuberculoid leprosy in the Madrid system are considered tuberculoid in the original Indian classification and TT or BT in the Ridley-Jopling and Job-Chacko classification.<sup>9</sup> Borderline or dimorphous leprosy in the Madrid classification can be either paucibacillary or multibacillary in the World Health Organization system depending on the bacterial index.<sup>9</sup> It is considered borderline in the original Indian classification, BT, BB or BL in the Ridley-Jopling and BL or BT in the Job-Chacko classification.<sup>10</sup>

**OBJECTIVE**

Analysis of association between types of lepra reactions and it's histopathological findings.

**MATERIALS AND METHODS**

Present study was carried out in patients attending the Out patient and Inpatient, Department of Skin & VD Patna Medical College & Hospital, Patna from December 2017 to August 2018.

**Method of Collection of Data :**

63 patients of leprosy in reaction belonging to all age groups and both sexes were randomly selected and included in the study after taking their consent. In each case detailed history,

thorough general physical, local and systemic examination with reference to epidemiology and clinical features of leprosy reactions were done. In all cases necessary investigations and skin biopsy for histopathological examination was done with their consent.

**Selection Criteria**

**Inclusion Criteria**

- Clinically diagnosed case of lepra reaction type 1 or 2 having fresh episode.

**Exclusion Criteria**

- Patient not willing to participate in study.
- Patient currently on any immunosuppressant drugs or taking medication for previous episode of Reaction.

**RESULTS**

**Table -1 : Showing distribution of patients**

Out of total 63 patients , 26 patients were of Type 1 reaction while 37 of Type 2 reaction.

Type of Reaction	No. of pts	Percentage
Type 1	26	41.3%
Type 2	37	58.7%
Total	63	100%

**Table – 2 : Reactions in different types of leprosy**

Types of leprosy	No of Rectional patients		Percentages
	Type 1	Type 2	
TT	00	00	-
BT	21	00	33.3%
BB	03	00	4.8%
BL	02	14	25.4%
LL	00	23	36.5%
Total	26	37	

Among 26 type 1 reaction patients 21 were of Borderline Tuberculid, 3 of Mid Borderline while 2 were of Borderline Lepromatous, thus BT patients had higher incidence of type 1 reaction.

Among 37 type 2 patients 23 were of lepromatous leprosy while rest 14 of borderline lepromatous.

**Clinico-Histopathological Correlation**

**Table -3**

Diagnosis by clinical methods	Diagnosis by HPE		Total
	Type 1 reaction	Not type 1 reaction	
Type 1 reaction	22	04	26
Not type 1 reaction	05	32	37
<b>Total</b>	<b>27</b>	<b>36</b>	<b>Kappa(K) = 0.71</b>

**Table – 4**

Diagnosis by clinical methods	Diagnosis by HPE		Total
	Type 2 Reaction	Not type 2 Reaction	
Type 2 reaction	32	05	37
Not type 2 reaction	05	22	26
<b>Total</b>	<b>36</b>	<b>27</b>	<b>Kappa(K) = 0.71</b>

Kappa values provide a summary measure of agreement between two different modes of diagnosis.

Kappa = (Observed frequency of agreement – Expected frequency of agreement) / (Total observed – Expected frequency of agreement)

KAPPA (K)	INTERPRETATION
< 0	No agreement
0 – 0.19	Poor agreement
0.20 - 0.39	Fair agreement
0.40 – 0.59	Moderate agreement

0.60 – 0.79	Substantial agreement
0.80 – 1.0	Almost perfect agreement

In present study Kappa (K) value was 0.71, which means there was substantial agreement between diagnosis by clinical & Histopathological methods.

**DISCUSSION**

Fine et al<sup>132</sup> (1993) showed in their report that there could be inter-observer variations in histopathological diagnosis of clinically suspected leprosy due to subjective interpretation and similar variations could also exist in diagnosing a lepra reaction.<sup>8</sup> Correlation of clinical and histopathologic features appears to be more useful for accurate typing of lepra reaction than considering any one of the single parameter alone.

**CONCLUSION**

In the present study prevalence of type 2 lepra reaction was higher than type 1 lepra reaction. This study emphasizes the need for detailed history, clinical examination and investigations including biopsy for timely recognition of reactions, in order to halt the progress and prevent the permanent damage it causes. As majority of the patients had borderline leprosy which is the usual scenario, type 1 reaction was more among them. Similarly the higher incidence of type 2 reaction among LL patients is an established fact. Erythema and swelling of the skin lesions, neuritis and oedema of hands and feet were common features of Type 1 reaction. Fresh crops of tender evanescent nodules, joint pain, neuritis and fever were common in Type 2 reaction. Leprosy reactions occur frequently during the course of disease and it's treatment and they sometimes may show clinicopathologic discordance.

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