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Leprosy-Clinico Pathological Study

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I. Introduction

Leprosy, first described in ancient Indian texts from the sixth century B.C,is a nonfatal, chronic infectious disease caused by Mycobacterium Leprae. M. Leprae is an acid-fast obligate intracellular organism that grows very poorly in culture but can be propagated in the armadillo. It proliferates best at 32° to 34°C, the temperature of the human skin and the core temperature of armadillos[1]. Clinical manifestations are largely confined to the skin, peripheral nervous system, upper respiratory tract, eyes, and testes[2]. The mode of transmission of leprosy is unknown, but it is probably inhalation of bacilli**,** which may be excreted from the nasal passages of a multibacillary patient, or possibly implanted from organisms in the soil. Direct person-to-person infection by means of the skin occurs rarely if at all. After inhalation, it is likely that bacilli pass through the blood to peripheral and cutaneous nerves, where infection and host reaction commence[3].It is present in various clinicopathological forms depending upon immune status of the patients. Ridley and Jopling classification is used to classify leprosy. Leprosy is widely prevalent in India. There were 0.86 lakh leprosy cases as on 1st April 2016 with a prevalence rate 0.66/10000 population.[4] Leprosy is a disease which, apart from causing awful disfiguration,physical pain and hardship, leads to isolation, rejection and social stigma that still characterize attitudes towards leprosy[5]. Histopathological study of leprosy is very important in understanding the disease, its varied manifestation and complications.For accurate and adequate treatment the diagnosis must be made early & it should be accurate. This study was undertaken to study the clinical patterns and histopathological features of leprosy in skin biopsies in suspected cases of leprosy and perform clinicohistopathological correlation .Histopathological examination of skin provides confirmatory information in suspected cases and gives indication of progression and regression of disease under treatment.

II. Materials And Methods

The present study was carried out retrospectively in the department of pathology,GMC Jammu over a period of 1 year. It included 100 skin biopsies of patients in whom leprosy was clinically diagnosed or suspected. The data was retrieved from the records maintained in the department which included age, sex, clinical examination (site of lesion, its size, type,sensory and motor loss) and diagnosis, and histopathological findings. Histopathological findings were graded into Tuberculoid(TT), Borderline-Tuberculoid (BT), Midborderline (BB), Borderline-Lepromatous (BL), and Lepromatous(LL), according to Ridley and Jopling scale. Biopsies which did not include the full depth of dermis together with a portion of subcutaneous fat were considered as inadequate and not classified histopathologically. Sections showing scattered nonspecific lympho-histiocytic infiltration with cellular reaction with in dermal nerve or presence of bacilli in subepidermal zone/ arrectores pilorum muscle/ dermal nerve were classified as indeterminate leprosy [6]and also included for purpose of analysis. In some cases there was no evidence of granulomas and nerve infiltration by lymphocytes. Dermis showed infilteration by chronic cell inflammatory infiltrate. These cases were considered as non specific. The clinicopathological concordance was calculated using percentage parity. Lepra bacilli positivity was seen microscopically using Zeihl- Neelsen stained paraffin sections.

III. Results

Out of 100 cases studied 74 were males and 26 were females. Majority of them were in the age group of 35-51 years (38 patients) and 18-34 years (36 patients). Age range varied from 10-70 years. Clinically 26 patients were classified as borderline tuberculoid type, 14 borderline lepromatous, 12 as midborderline, 12 as lepromatous and 24 remained unclassified. 2 cases were histoid, 4 were erythema nodosum leprosum, 2 presented as relapse. In 4 cases leprosy was kept as the differential diagnosis. Histopatholgically 22, 14 and 12 cases were classified as BL, LL and TT respectively. 10 cases each were classified as BB and BT. 6,6 and 2

cases were diagnosed as indeterminate, erythema nodosum leprosum and histoid leprosy respectively. 2 were inadequate biopsies. 16 cases showed non specific changes. Among the various types maximum concordance was seen with lepromatous type (66%) followed by borderline lepromatous (57%), midborderline (33%) and borderline tuberculoid (23%). Histoid leprosy showed 100% clinicohistopathological correlation.Overall concordance was seen to be 42%.

	TT	LL	BL	BB	BT	IDT	HISTOID	ENL	Non-Specific	Clinically no of cases
TT										0
LL	2	8						2		12
BL	2	2	8	2						14
BB	6			4		2				12
BT		2	4	2	6	4			8	26
HISTOID							2			2
ENL								4		4
UNCLASSIFIED		2	10	2	4					24
RELAPSE										2

AFB positivity was seen in 38 cases out of which 14,12,4,2,2 were LL, BL, BB, BT and TT respectively.2 each were ENL and histoid leprosy. Percentage postivity was 100%, 54.5%, 20%, 40%, 16.6% for LL, BL, BT, BB and TT respectively.

IV. Discussion

In the present study there were 74 males and 26 females. There are more opportunities for contact in males that may contribute to male predominance in addition to factors like industralization, urbanization and less number of females reporting for management due to social customs and taboos. Generally, leprosy is believed to be more common in males than in females. Majority of the patients were in the age group of 35-51 years (38 patients) and 18-34 years (36 patients). Age range varied from 10-70 years. Similar observations were made by studies done by Nandkarni NS& Rege VL[7] ,Singh A et al[8], Pasupathy M& MB Ramesh[9],.Long and variable incubation period may be responsible for this age distribution. In our study clinically 26 patients were classified as BT, 14 as BL, 12 as midborderline, 12 as lepromatous and 24 remained unclassified. 2 cases were histoid, 4 were ENL, 2 presented as relapse. In 4 cases leprosy was kept as the differential diagnosis. Histopatholgically 22, 14 and 12 cases were classified as BL, LL and TT respectively. 10 cases each were classified as BB and BT. 6,6 and 2 cases were diagnosed as indeterminate, erythema nodosum leprosum and histoid leprosy respectively. 2 were inadequate biopsies. 16 cases showed non specific changes. Most of the leprosy cases are in a continuous changing immunological spectrum (BT,BL and BB). They can move towards the tuberculoid type (with treatment) or the lepromatous type (without treatment). Biopsy from a case at an earlier stage may show features of BT while that from a case recognized at a later may show features of BL. %), BL 20(14.81%), LL 07(5.18%) and BB 1(0.74%). Borderline group constituted the major spectrum (73.33%). Bommakanti J et al [10]found in their study that majority of the cases were BT followed by LL, BL, TT and BB. The histopathological diagnosis showed majority of them are BT(39), BL(11), LL(10), TT(7), Indeterminate(3) & No evidence of leprosy(5). Tekwani D et al[11] in his study revealed maximum (62.22%) cases of BT, followed by BL(17.77%), TT (8.88%), LL (5.92%) and BB (2.96%). There were 2.22% cases of Histoid leprosy. Out of 135 cases, the most common subtype histologically was BT 78(57.77%) followed by TT 26(19.25Among the various types maximum concordance was seen with lepromatous type (66%) followed by borderline lepromatous (57%), midborderline (33%) and borderline tuberculoid (23%). Histoid leprosy showed 100% clinicohistopathological correlation. Overall concordance was seen to be 42%.

Clinico-histopathological Correlation

Authors	LL	BL	BB	BT	TT	IL	Total
Bhatia AS et al[12]	91%	43%	26%	77%	50%	36%	69%
Bijaragi S et al[13]	76.9%	40%	16.7%	57.3%	75%	66.7%	57.3%
Manandhar U et al[14]	57.14	57.14	0	63.15	24	0	45.33%
Thapa DP & Jha AK[15]	16.7%	0	0	42.9%	66%	0	
Kakkad Ket al[16]	93%	60%	50%	83%	100%	-	84%
Present Study	66%	57%	33%	23%	-	-	42%

Maximum concordance was observed in LL types of leprosy, which was similar in studies by Mathur MC et al[17] ,Giridhar et al[18]. In our study indeterminate leprosy was found histologically than clinically which was also observed in a study by Moorthy et al[19]. Due to non specific features indeterminate leprosy can't be classified within the Ridley-Jopling spectrum. Disconcordance seen could be due to the fact that criteria for histopathological classification are precise with emerging microbiological and immunological techniques while clinical classification takes into account only the gross appearance of the lesion. Various factors affect the histopathological diagnosis, like number of cases of each type, age of the lesion, nature and depth of the biopsy, quality of the section, number of acid-fast stained sections examined, immunological and treatment status of the patient at the time of diagnosis. If biopsy is taken at an early stage, discordance between clinical and histopathologic observation is more likely.

V. Conclusion

There is considerable overlap between different types of leprosy so biopsies should be taken from representative lesions in all cases and both histopathological and clinical features should be considered for definitive diagnosis of leprosy. Histopathological study of skin lesions plays a vital role in diagnosis and classification of leprosy which inturn leads to proper treatment and decrease the burden of disease in the society.

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