



Original Article

Clinico- bacterial correlation of bacterial index in Hansen's disease

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ABSTRACT

Background: Leprosy has a broad spectrum of clinical manifestations. Clinical information along with Bacterial evidence is necessary to achieve accurate diagnosis. The present study was carried out to find out clinical and bacterial correlation in various presentations according to Ridley Jopling classification of Hansen's Disease.

Materials and Methods: It was a hospital based cross-sectional comparative study of 72 leprosy patients over a period of 1 year and its clinico-Bacterial correlation was done with the help of Slit Skin Smear and clinical classification.

Results: This study included 72 leprosy patients at various stages according to Ridley Jopling classification. Maximum cases belonged to Borderline Tuberculoid leprosy 28(38.88%) followed by Tuberculoid leprosy 15(20.83%). Slit Skin Smear showed 12(42.85%) of Borderline Tuberculoid and 3(20%) of Tuberculoid cases had disparity and didn't match corresponding clinical subtype.

Conclusion: Clinical features along with Bacterial index is useful in making accurate diagnosis so that appropriate treatment could be started and hence deformity and disability could be prevented.

INTRODUCTION

Leprosy is a granulomatous infection caused by Mycobacterium Leprae. Despite having accurate classification leprosy shows many diversity.¹ As leprosy affects mainly skin and peripheral nerves, the bacilli are demonstrated through Slit Skin Smear of the skin. Ridley Jopling classified leprosy as Tuberculoid (TT),

Borderline Tuberculoid(BT), Borderline Borderline(BB), Borderline Lepromatous(BL) and Lepromatous Leprosy(LL).² Depending on degree of immunity, clinical and histopathological features, various types of leprosy may develop.³ According to Ridley Jopling Classification, people with higher immunity are towards Tuberculoid pole, and those with poor immunity are towards lepromatous pole.² Diagnosis of leprosy is mainly clinical but at times to confirm the diagnosis and monitor treatment histopathology and Slit Skin Smear is necessary, as correlation of clinical and histopathological features with Bacterial index appears to be more useful and accurate than considering single

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Table 1: Clinical and Bacterial correlation

Clinical type	No. of cases	Parity(%)	Disparity(%)
TT	15	12(80%)	3(20%)
BT	28	16(57.15%)	12(42.85%)
BB	1	1(100%)	0(0%)
BL	14	12(85.7%)	2(14.3%)
LL	12	11(91.6%)	1(8.4%)
PNHD	2	2(100%)	0(0%)

parameter alone. Bacterial index is highest 5+ to 6+ towards lepromatous pole and lowest towards Tuberculoid pole having 0. The density of bacilli is recorded as bacterial index. Many clumps or over 100 bacilli in an average field is 6+, 100 to 1000 bacilli in an average field is 5+, 10 to 100 in an average field is 4+, 1 to 10 in an average field is 3+, 1 to 10 bacilli in 10 fields is 2+ 1 to 10 bacilli in 100 field is 1+2 The present study has been conducted for clinical and Bacterial correlation with the help of Slit Skin Smear to classify type of leprosy and to confirm the diagnosis.

MATERIALS AND METHODS

This study was a hospital based, cross sectional comparative study of 72 patients, who were diagnosed as Hansen's disease between July 2015 and July 2016. It was conducted in the Department of Dermatology and Sexually Transmitted Infections, Shri Birendra Hospital, Chhauni, Kathmandu. Ethical clearance was taken from the hospital ethical board. The diagnosis was made on the basis of clinical examination and Slit Skin Smear.

Slit Skin Smear was taken from the chosen skin which was first cleaned with spirit swab. The skin was pinched between thumb and index finger so that bleeding is minimized. Then a cut of about 5mm long and 3mm deep was given with the help of no 15 scalpel blade. The blade was then turned to 90° then using the blunt edge of the blade the side of cut was scrapped several times to obtain tissue pulp from below epidermis. This material was transferred to a glass microscope slide and a thick smear was obtained with a diameter of 5-7mm. Smears were taken from both earlobes, both eyebrows, one from the lesion and one from the normal skin. For Pure Neural Hansen's Disease patients smear from the area of anesthesia was taken. The slide was then fixed and stained by Ziehl-Neelsens method. After staining, slides were examined using a 100x oil immersion lens of microscope. The clinical classification was on the basis of skin lesions, anesthesia or hypoaesthesia and nerve involvement and clinically they were classified according to Ridley Jopling. Statistical analysis was done using SPSS 16.0.

RESULTS

Seventy two clinically diagnosed cases of leprosy were

included in the study. Age varied from 12 to 70 years. Out of total 72 patients 2(2.7%) were children and 70(97.3%) were adults with 65(91.3%) male and 7(9.7%) female. The most common clinical type was Borderline Tuberculoid 28(38.88%) followed by Tuberculoid 15(20.83%). Borderline 1(1.38%), Borderline Lepromatous 14(19.4%), lepromatous Leprosy (LL) 12(16.66%) and 2(2.77%) were Pure Neural Hansen's disease (PNHD). Out of 72 patients, 52(72.22%) were having bacilli in Slit Skin Smear. Among 72 patients 46(63.88%) patients showed appropriate correlation between clinical type of leprosy and Bacterial index. Whereas 26(36.12%) showed disparity between clinical type and Bacterial Index. Other than BB and PNHD where 100% correlation was seen maximum correlation was observed in LL where 11(91.6%) out of 12 and BL 12(85.71%) out of 14. Maximum disagreement was seen in BT 12(42.85%) followed by TT 3(20%) (Table No. 1).

Bacterial index in 8(53.33%) of TT was 1+ to 2+ and in BT 6(21.42%) were 0, and 6(21.42%) were 3+ to 4+. Two (14.28%) patients of BL and 1(8.33%) patient of LL didn't match the clinical diagnosis.

DISCUSSION

This study was carried out to demonstrate the correlation between clinical diagnosis and Slit Skin Smear. Demonstrating Acid Fast Bacilli still considered important for the diagnosis, classification and management of leprosy.^{4,5} Even though the sensitivity of Slit Skin Smear is poor (10-50%).⁶ It is still considered most useful tool for all practical purposes. Diagnosing and classifying leprosy solely on the basis of skin lesions as per WHO operational classification may lead to over or under diagnosis and inadequate treatment particularly of pauci-lesional multibacillary cases with consequent risk of resistance, relapse and progressive horizontal transmission.⁷ Slit Skin Smear was positive in this study 52(72.22%) whereas a study carried out in Lady harding college, New Delhi, it was 43 (56.58%).⁸ And in a study in Nepal at Tribhuvan University Teaching Hospital it was 31(43.05%).¹ In TT the BI should be 0 but it was found to be 1+ - 2+ in 3 (20%) cases and similarly in 6 patients of BT pole BI was 0 and 6 patients of BT had BI 3+ to 4+. This disparity can be attributed to 2 reasons, firstly there could be error in clinical diagnosis and secondly patient could be downgrading from TT and BT pole towards LL pole. In our study clinically most common type of leprosy was BT 28 (38.88%) followed by TT 15 (20.83%) whereas a study conducted in Tribhuvan University Teaching Hospital, the commonest type was TT (25/75, 33.33%) followed by BT (19/75, 25.33%).¹ In BL 2(14.28%) and LL 1(8.33%) BI was found to be low and it was 3+ and 4+ respectively. We attribute this to technical error in performing Slit Skin Smear and microscopy or clinical judgment. Various other factors could be the cause of disparity including patient in reaction, treatment, technique of taking samples, staining and inter-observer variation in clinical diagnosis. It is very difficult

even for experienced leprologist to diagnose early lesion of leprosy.¹ Some degree of overlap are seen between different types of leprosy.¹ Acid Fast Bacilli are better demonstrated in biopsies than in Slit Skin Smear due to presence of bacilli in deep reticular dermis.⁹ Taking all these in account it is very much necessary to properly classify Leprosy so that in time proper treatment could be started and misclassification leads to increased risk of relapse due to insufficient treatment if a multibacillary patient is classified as paucibacillary.¹⁰

CONCLUSION

Slit Skin Smear is an important tool which helps in the diagnosis of Hansen's Disease. It should always be done to the patients. Clinical features along with Bacterial index is useful in making accurate diagnosis so that appropriate treatment could be started and hence deformity and disability can be prevented.

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