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Dermatology

SMEAR EXAMINATION: AN IMPORTANT TOOL IN LEPROSY AND RELAPSE

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ABSTRACT

BACKGROUND: Since ancient times, leprosy has been regarded as a contagious, disabling and incurable disease. It is estimated to have disabled one to two million people visibly and irreversibly.

OBJECTIVE: To highlight the need for smear examination in every case of suspected leprosy to prevent relapse and further transmission, and achieve complete cure.

METHODS: Retrospective analysis of an incidental finding of relapse cases from the 10 year data (April 2005 to March 2015), a study from Amritsar district.

RESULTS: The relapse rate was found to be 1.95% and on further analysis, it was seen that the MB cases in which the bacterial load was high before the treatment were the ones that had relapsed.

CONCLUSION: 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 which can further cause relapse, spread of infection and resistance.

KEYWORDS : Leprosy; Relapse in leprosy, Smear examination

INTRODUCTION

Leprosy is a chronic infectious disease caused by *Mycobacterium leprae* presenting with manifestations as varied as a single cutaneous or nerve lesion to the involvement of whole of the integument and systemic organs[1].

Leprosy is unique in terms of the nature of the causative organism, the chronicity of the disease and its prolonged treatment. Often, termination of treatment is based on the completion of the recommended duration of therapy rather than the disappearance of the clinical signs and symptoms which led to the initiation of the treatment in the first place.[2]

In 1981, WHO recommended the classification of leprosy for operational purposes as paucibacillary (PB) and multibacillary (MB) to simplify it for the health workers but the expertise needed to recognize a wide range of presentations of symptoms and signs of this disease are vanishing. Initially WHO incorporated slit skin smears in this classification and the patients with bacterial index (BI) 2+ were categorized as MB. In 1988, further modifications were done so that any positive site was included in MB category. Much later the need for skin smear was dropped altogether so that now anyone with 6 or more skin lesions is placed in MB category.[3]

A skin smear is a multipurpose test to confirm the diagnosis of MB leprosy or to diagnose a relapse in a patient who has previously been adequately treated, or to help with the classification of new patients[4]. In the pre-MDT era, skin smears were routinely used for classifying a case of leprosy as PB or MB. However, the quality of skin smears and of microscopy was the weakest link in most leprosy elimination programmes: fewer than 15% of newly diagnosed cases show positive results in this investigation, and diagnosis is rarely based on skin smear results under field conditions. Moreover, they are painful and carry the risk of serious infections (particularly HIV and hepatitis)[5]. Hence, the need for skin smear was dropped by WHO.

Relapse in leprosy according to The Guide to Leprosy Control (WHO 1988) is defined, in the clinical sense only, as a person who successfully completes an adequate course of MDT, but subsequently develops new signs and symptoms of the disease either during the surveillance period or thereafter[6]. But the most reliable criteria for defining relapse includes not only clinical but also bacteriological, serological, therapeutic, histopathologic criteria or at times the clinicians may need to use their judgement to modify the standard WHO treatment regimes according to the scenario of each patient.[2]

The WHO has estimated a risk of relapse of 0.77% for MB and 1.07% for PB patients 9 years after stopping MDT. Various other studies using person-years of observation estimate relapse rates varying from 0.65 to 3.0% for PB and 0.02 to 0.8% for MB leprosy.[6]

Relapse in such bacterial infections usually indicates a failure to treat the infection thoroughly hence gave a food for thought for this write up in the incidental finding of relapse cases in the retrospective analysis of Leprosy data of Amritsar district (April 2005 to March 2015).[7]

MATERIALS AND METHOD

A retrospective data analysis of an incidental finding of 19 relapsed cases out of the 10 year study (April 2005 to March 2015) was done at the district hospital in Amritsar. These cases were further analyzed to find out the reason of relapse.

DISCUSSION & RESULTS

Leprosy has been a major public health problem of India in the last century. Leprosy control programs were initiated in 1955 followed by multidrug therapy (MDT) in 1982[8]. After the successful result obtained with the implementation of this, further studies were focused on relapses in leprosy which have shown that the magnitude of relapse in the post treatment follow up period is an important parameter of efficacy and robustness of the regimen.[9]

With this aim, we analyzed the 19 relapse cases in our 10-year study during the time period between April 2005 and March 2015. Relapse rate was found to be 1.95%. Similar relapse rate of 1.84% of MB cases is shown in a study in 2008 conducted at Karnataka[9] but the relapse risk according to WHO was estimated to be 0.77% for MB cases[6].

Out of them, 68.4% were males and 31.6% were females with the youngest being 12 years old and the eldest 55 years old (TABLE 1). Similar male over female preponderance in relapse is found in a study conducted in South India between 2005 and 2010[10]. This difference is due to the increased mobility of males and hence the opportunity for contact. Whereas, traditional beliefs, women's limited mobility, illiteracy and poor knowledge of leprosy are also important factors responsible for underreporting of cases of women affected with leprosy[11].

52.6% cases were punjabi (indigenous) and 47.4% non-punjabi with only 63.15% cases being BCG vaccinated. More indigenous cases

were noticed due to the increased influx of migrants in this district. 18 cases belonged to MB and 1 to PB leprosy which was reclassified later as MB as after six months of PB therapy, there was relapse. Rest of the cases had already completed 1 year MB course. Amongst them, most common diagnosis was Borderline Tuberculoid leprosy in 10 cases (4 Punjabi, 6 non-Punjabi). There were 7 cases of Lepromatous leprosy (4 Punjabi, 3 non-Punjabi) and 2 cases were Borderline Leprosy in the Punjabi population. (TABLE 2)

100% LL cases, 50% BB cases and 10% BT cases showed AFB positivity before treatment and 57.1% of LL still showed the same on RFT while the others showed varying degree of granulomas or perivascular infiltrates. There was no record found in 15.8% cases (TABLE 3). Further, it showed that 47.3% cases had bacteriological index of 4+ to 6 + at the time of diagnosis and at release from treatment showed 3+ to 5+ index. Similar relapse is noted in cases with BI ≥4+ in some studies[12, 13]. This in itself means that bacteria are still active even after 1 year of MB treatment and so the treatment has to be continued till smear negativity.

Hence smear examination at the time of diagnosis and RFT is important in all cases if we want to achieve a complete cure. This highlighted that although the relapse rate after MDT is low but the bacterial load before initiation of therapy is an important factor that determines relapse[9] and hence should not be overlooked.

In all the above cases, retreatment with WHO MBMDT for one year course was started after a gap of 2 months to 1 year from last therapy. This criterion of relapse was in accordance with WHO standard guidelines. No comment on further follow-up was given in the record.

CONCLUSION

From our observation of these cases, we can conclude the following:

- Diagnosis and classification of leprosy solely on the basis of skin lesions as per WHO operational classification may lead to over or under diagnosis and inadequate treatment, especially MB cases with less than 6 lesions, which can further increase the risk of resistance, relapse and transmission.
- Smear examination is an integral part of classifying, diagnosing, and treating leprosy as without it, many cases may be misdiagnosed or altogether missed in a general setting where trained eyes are not posted, and hence should be considered in every case of leprosy which may help in preventing relapse.
- Although the risk of relapse is very low according to different studies both for PB and MB cases after completing the adequate WHOMDT, but still these cases should be identified and put back on chemotherapy as soon as possible to prevent further disability and transmission of infection.
- Proper record keeping with minute details and capacity building of health workers and lab technicians are indispensible in this scenario.
- Special focus is needed on cases needing treatment for more than 1 year and their follow-up is important to prevent relapse.

TABLE 1: Disease Classification according to age group and sex

S.No	Age group	Male	Female	Total
1	10-30	6	1	7
2	31-50	7	4	11
3	>51	0	1	1
	Total	13	6	9

Table 2: Disease classification according to clinical diagnosis in Punjabi and non-Punjabi people

S. no	Clinical Diagnosis	Punjabi	Non Punjabi	Total
1	TT	0	0	0
2	BT	4	6	10
3	BB	2	0	2
4	BL	0	0	0
5	LL	4	3	7
Total		10	9	19

Table 3: Disease classification according to histopathology in Punjabi and non-Punjabi people

S. No.	Type of Leprosy	1st Biopsy	RFT Biopsy
1.	LL	AFB+	No record
2.	LL	AFB+	AFB+
3.	LL	AFB+	AFB+
4.	LL	AFB+	AFB-, granuloma +
5.	LL	AFB+	AFB+, granuloma +
6.	LL	AFB+	AFB+
7.	LL	AFB+	Perivascular infiltrates
8.	BT	AFB-, HP for PBL	AFB-, clinically lesions persisted
9.	BT	No record	No record
10.	BT	AFB-	Granuloma +
11.	BT	AFB-	Granuloma +
12.	BT	Foamy macrophages	Perivascular infiltrates
13.	BT	PBL	TT
14.	BT	TT	Perivascular infiltrates
15.	BT	No record	PBL
16.	BT	AFB-	AFB-, clinically lesions persisted
17.	BT	AFB+	Perivascular infiltrates
18.	BB	No record	No record
19.	BB	AFB+, foamy macrophages	PBL

LIMITATIONS OF THE STUDY

Small study group is the main limitation of this study. Also, as this is a study based on an incidental finding, more planned studies should be conducted in order to evaluate relapse better.

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