Section: Microbiology

Original Research Article

A RETROSPECTIVE ANALYSIS OF LESIONS WITH INDICES BY SLIT SKIN SMEAR FOR LEPROSY

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ABSTRACT

Background: Leprosy is a disease that predominantly affects the skin and peripheral nerves, resulting in neuropathy and associated long-term consequences, including deformities and disabilities.[1] Brazil, India and Indonesia reported more than 10,000 new cases each, together accounting for 79.3% of new cases detected globally. These 3 countries also showed an increase in new case detection in 2023.[2] The aim & objective is to determine the prevalence of Leprosy in suspected cases along with their bacteriological and morphological indices and their correlation with clinical sign and symptoms. **Materials and Methods:** After taking permission from Institutional Ethics Committee and the verbal consent of the patient for obtaining the slit skin smear, detailed history & required examination of the patient was carried out. Smear stained with Zeihl -Neelsen stain and graded for both BI (Bacteriological Index) and MI (Morphological Index). Data analyzed and correlated. **Result:** Retrospective study of 6months (October 2024 to March 2025) was done. Total 134 patients were sent from dermatology department to microbiology lab for slit skin smear. Leprosy found in 80 (59.7%) patients with ages 18 to 80 years and in 76.3% males and 23.8% females. 40% showed nerve involvement, 61.3% showed skin lesions, 63.7% showed sensory loss. 1.2% have 5+ BI and 30% have >25% MI. **Conclusion:** In our study high prevalence of leprosy is seen instead of availability of better health services and health programmes. There is a need of awareness of rural public for route of transmission as mostly people taking it as contagious rather than transmitted by droplet. This is a major reason of increasing number of cases and neglected patient care or treatment by their own family members.

INTRODUCTION

Leprosy is a disease that predominantly affects the skin and peripheral nerves, resulting in neuropathy and associated long-term consequences, including deformities and disabilities.[1] Brazil, India and Indonesia reported more than 10,000 new cases each, together accounting for 79.3% of new cases detected globally. These 3 countries also showed an increase in new case detection in 2023.[2] Leprosy is a chronic granulomatous infectious disease caused by Mycobacterium leprae and mainly involves skin, peripheral nerves, mucosa of the upper respiratory tract, and eyes. Leprosy is curable and disability can also be prevented with proper treatment, especially when the treatment is initiated during early stages.[3] Early diagnosis and complete treatment with multidrug therapy (MDT) remain the key strategies for reducing the disease burden of leprosy.[1] Demonstration of acid fast lepra bacilli in stained smears is a practical approach to confirm the diagnosis, monitor the progress of disease, treatment outcome and for calculating the bacteriological and morphological indices.[4]

Aim and Objectives

To determine the prevalence of Leprosy in suspected cases along with their bacteriological and morphological indices and their correlation with clinical sign and symptoms.

MATERIALS AND METHODS

After taking permission from Institutional Ethical Committee and verbal consent of the patient, steps of slit skin smear were explained to him or her. Detailed history & required examination of also carried out. The slit was made on the skin of the both earlobes, forehead, nose and lesion. The smear was stained with Ziehl-Neelsen stain with 5% sulphuric acid as decolorizer. The lepra bacilli seen as pink rods in single, small groups or closely packed bunches called as globi. All the smears are graded for the purpose of BI (Bacteriological Index) and MI (Morphological

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Index). Sign, symptoms and treatment history correlated and analyzed with BI and MI.

RESULTS

Retrospective study of 6months (October 2024 to March 2025) was done. Total 134 suspected or confirmed leprosy patients of all ages were sent from dermatology department to microbiology lab for slit skin smear. Leprosy found in 80 (59.7%) patients with ages 18 to 80 years and in 76.3% males and 23.7% females. 86.3% were observed in low socioeconomic individuals. 40% showed nerve involvement, 61.3% showed skin lesions, 63.7% showed sensory loss. 1.2% have 5+ BI and 30% have >25% MI. 61.3% and 62.5% patients showed 0+ MI and BI respectively.

Table 1: Shows gender and age groups of patients

Gender	**No.**
Male	61 (76.3%)
Female	19 (23.7%)
Age groups	No.
0-20 years	14 (17.5%)
21-40 years	27 (33.7%)
41-60 years	23 (28.7%)
61-80 years	16 (20.0%)

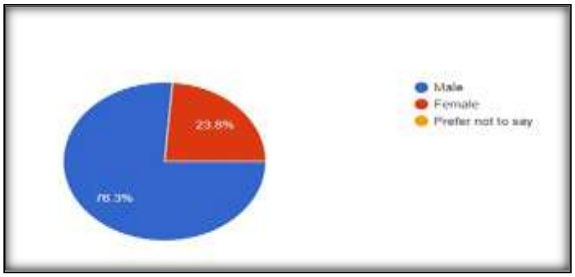

Chart 1: Shows gender distribution

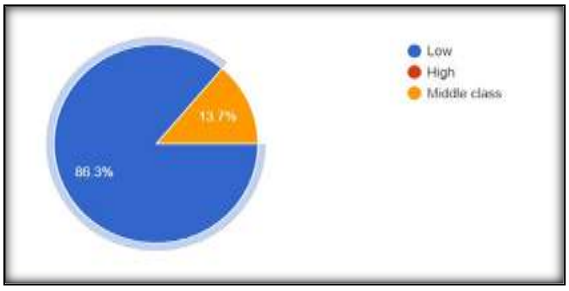

Chart 2: Shows Socioeconomic status

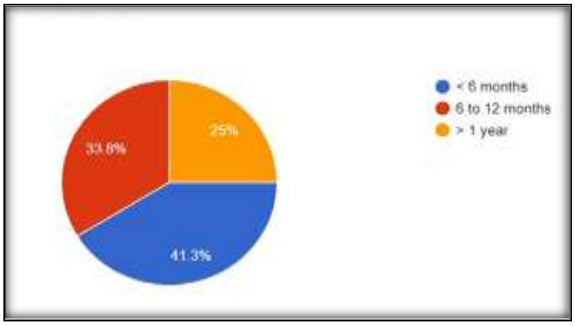

Chart 3: Shows duration of symptoms

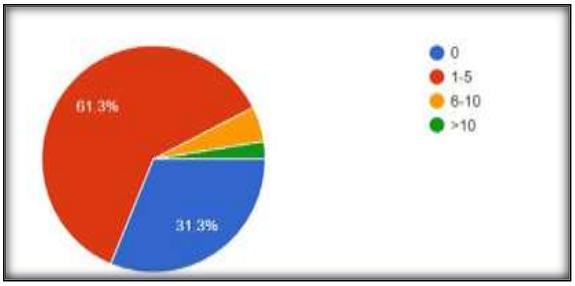

Chart 4: Shows no. of skin lesions

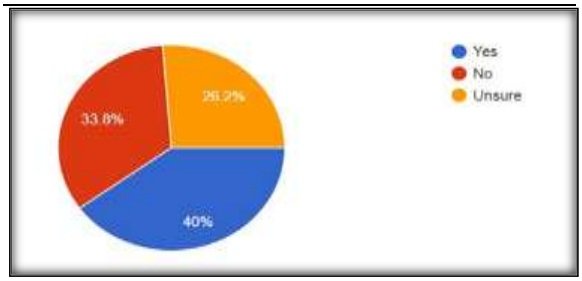

Chart 5: Shows nerve involvement

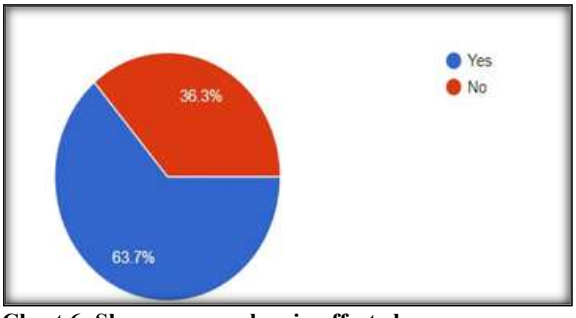

Chart 6: Shows sensory loss in affected area

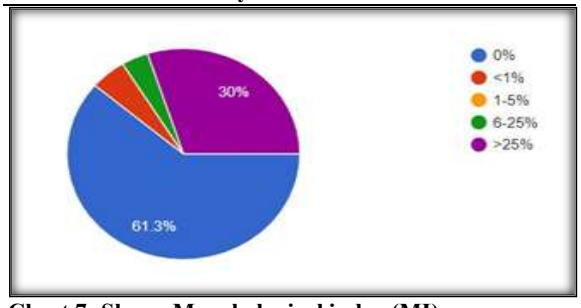

Chart 7: Shows Morphological index (MI)

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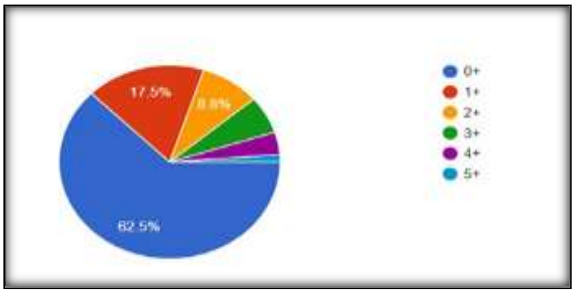

Chart 8: Shows Bacteriological index (BI).

Table 2: Shows correlation of BI with signs and symptoms.

Bacteriological index	Nerve involvement	Tenderness	Nodules and macular lesions	Loss of sensation
0 [negative]	42.85%	15%	38.46%	48.07%
1+	22.85%	16.25%	26.9%	23.07%
2+	20%	25%	11.5%	13.46%
3+	8.57%	3.75%	9.6%	5.76%
4+	2.85%	16.25%	5.76%	7.69%
5+	2.85%	11.25%	7.69%	1.92%
6+	0%	0%	0%	0%

Nerve involvement is highest in BI 0 (42.85%) and gradually declines with increasing BI. Tenderness is relatively higher at 2+ (25%) but otherwise does not follow a linear pattern. Nodules and macular lesions are most frequent at BI 1+ (26.9%) and decrease as BI increases. Loss of sensation is most frequent at BI 0 (48.07%), then sharply drops with higher BI.

Table 3: Shows correlation of MI with signs and symptoms.

Morphological index	Nerve involvement	Tenderness	Nodules and macular lesions	Loss of sensation
0%	50%	45%	33.75%	61.25%
1-5%	25%	15%	21.25%	8.75%
6-25%	2.5%	11.25%	3.75%	2.5%
>25%	17.5%	25%	36.25%	22.5%

Nerve involvement is highest at MI 0 (50%) and decreases with higher MI. Tenderness is again highest at MI 0 (45%), with a downward trend. Nodules and macular lesions and loss of sensation show highest frequency at MI 0 and gradually decline with increasing MI. But at >25% MI all signs again increased.

DISCUSSION

Despite of many policies, strategies and programme leprosy is still remain a serious health problem in India. In this retrospective study we observed a high prevalence of the disease with male preponderance of 76.3% as males are more exposed to society and environment due to their working conditions. Which is similar to study of Deepak Vashisht et al,[5] with a data of 72.3% and of Jitu Mani Kalita et al,[3] with 71.43%. In our study 86.3% patients were observed in low socioeconomic status which is similar to study of Raghu Mudigere Thimmappa et al,[6] in which 89.10% patients were belong to low socioeconomic status. Majority of patients seen in middle age group, 21-40 years (33.7%) is similar to Raghu Mudigere Thimmappa et al,[6] and Ashwini S. Patil et al.[7]

Morphological index value seen more with more no. of patients while bacteriological index value seen less with less with no. of patients similar as in study of Syeda Mariam Seher[4] and Dr. Ritu Bhatt et al.[8] In fact due to immunity number of bacteria decreases and also by taking treatment bacteria became dead and stain non uniformly so, BI found same or more and MI became less.

Most of the patients in this study had nerve involvement in form of sensory loss without any visible skin lesion similar to Alemu Gedefie et al.[9] Sensory loss found in 63.7% patients which is in agreement with Ujjwal Kumar et al.[10] Mostly duration of symptoms found was less than six months. This is due to early presentation in health care centre, may be awareness of leprosy symptoms in community because patients have heard or seen them sometimes in their life due to high prevalence in the area. In our study 40% shows nerve involvement which is not go with Bharathi Sukumar et al. study,[11] they found 63%.

Nerve involvement, tenderness, nodules and macular lesions, loss of sensations are showing decreasing trend with bacteriological index grade but with morphological index they first decreasing at 6-25% due to immunity is present then increasing at >25% because of severity of disease but no immunity.

CONCLUSION

In this study male gender, middle age, low socio-economic status presented as risk factors and sensory loss is the earliest symptom of leprosy is found. We also could throw some light on the established fact that immunity decreases as the disease progresses and

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then indices and symptoms worsen. Since leprosy is a communicable disease and the only source is human so, it is important to educate and aware the general public about the preventive measures. Also, immunity plays an important role in its elimination. People should know this fact and especially low socio-economic status public have been promoted for good hygiene, health, its sign, symptoms, early care and full regular treatment.

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