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Original Research Article

A retrospective clinico epidemiological study of leprosy cases treated at tertiary care hospital Tirupur

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ABSTRACT

Background: Leprosy is a chronic communicable disease caused by Mycobacterium Leprae. The disease mainly affects the skin, peripheral nerves, mucosal surfaces of the upper respiratory tract, and eyes. Aim is to describe the clinical-epidemiological profile, and type of MDT given for leprosy cases treated at tertiary care hospital Tirupur.

Materials and Methods: A Retrospective study was done by obtaining records of all leprosy patients from the OP Leprosy registration card for a duration of one year from April 2021 – March 2022 were included in the study. The details of patients such as clinical and epidemiological profile were noted and descriptive analysis was done.

Results: During the study period, 35 cases of leprosy were included in the study. Majority of the cases were in age group 18 – 45 years. Male female sex ratio was found to be 2.5:1 and no childhood leprosy was recorded. Lepromatous leprosy was the most common type noted in this study. MB MDT was given in most patients. Grade 1 disability was recorded highly than grade 2. Type 1 reaction was found to be more and majority of the cases were noted in local group compared to migratory group.

Conclusion: The present study provides an insight into the disease burden as well as the effectiveness of the health-related services at a tertiary care hospital, Tirupur. The study also highlights the early diagnosis and management of leprosy and the importance of the surveillance activity, thereby minimizing the risks of leprosy in Tirupur.

1. Introduction

Mycobacterium leprae is a bacterial infection which leads to leprosy, sometimes referred to as Hansen's disease. The skin, peripheral nerves, mucosal surfaces of the upper respiratory tract, and the eyes were the primary organs affected by this condition. M. leprae is a tardy multiplier, and the average time it takes for the disease to develop is 5 years.[1] Histiocytes, schwann cells, and melanocytes are among the target cells.[2]

The main reasons of the delayed diagnosis have been identified as the extended incubation period and the tardy manifestation of the post-infection symptoms. Additionally, leprosy patients continue to face discrimination, prejudice, and shame in India. The patient is predisposed to eventual morbidity in the form of deformities and disabilities due to the delay in diagnosis, which feeds a vicious cycle. Despite free treatment and ongoing government initiatives, statistics reveal that leprosy remains a public health issue in India.[3] The two countries with the highest disease burden are India

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and Brazil.[4]

Based on the quantity of lesions, leprosy can be categorized by the World Health Organization (WHO) as either paucibacillary disease or multibacillary disease. Leprosy is classified according to Ridley Jopling into five categories: Lepromatous leprosy (LL), borderline lepromatous (BL), mid-borderline (MB), borderline tuberculoid (BT), and borderline lepromatous (BL).[5]

The most popular classification scheme was the Ridley Jopling system. The clinical and immunological status of the patient served as the foundation for this approach. The disease was organized in two poles lepromatous, tuberculoid poles and intermediate state dimorphous (borderline) leprosy.

Dimorphous cases are categorised as either borderline lepromatous, borderline tuberculoid, or borderline borderline depending on which pole (lepromatous or tuberculoid) they move towards. The early stages of the disease are thought to be represented by indeterminate state. These unstable instances inevitably move in that direction, but progression can be slowed down and a cure is still a possibility with the right medical care. In spite of the difficulty of clinical diagnosis at this point, a remedy is quite simple. All cases that are dimorphous or indeterminate move towards a pole and typically become lepromatous conditions if left untreated.

Leprosy is known to affect people of all ages, from infants to the elderly. It is treatable, and early treatment may prevent the disability. In close and repeated contact with untreated cases, it was spread by droplets from the mouth and nose.

According to World Health Organization (WHO) classification, paucibacillary cases are those with <5 skin lesions and no nerve involvement; multibacillary cases include ≥ 5 skin lesions. This system appears to be incorrect even though it is applied at all peripheral levels. This system is imperfect because many multibacillary cases are incorrectly labelled as paucibacillary, which has an impact on therapy.[6] Clinical evaluation was done by the examination of hypopigmented, hypo anesthetic and erythematous skin patches or skin lesions, nerve involvement, sensory impairment, motor deformity, trophic changes, disabilities and reactions. The most common things that can be quickly recognized during a physical examination and used to diagnose a patient having leprosy are clinical features. In order to diagnose leprosy, certain diagnostic procedures are handled there like slit skin smear test, skin biopsy. Electrophysiological nerve examinations include needle electromyography (EMG) and nerve conduction studies.[7] A low-cost, noninvasive technique is ultrasonography of the peripheral nerves in leprosy to assess the degree of peripheral nerve thickening.[8] There are many diverse and extensive leprosy differential diagnosis. Leprosy could be distinguished from other diseases mainly by sensory loss.

Before the onset of clinical signs and symptoms of the disease, nerve conduction investigations can demonstrate functional derangement of the nerves. Leprosy can cause a variety of nerve injury, from an intradermal nerve to peripheral nerve trunk or cranial nerve. The great auricular, ulnar, median, radial cutaneous, superficial peroneal, sural, and posterior tibial nerves, which are clinically palpable against the corresponding bony prominences when thickened and associated with tenderness in the case of coexisting neuritis, are some examples of superficial nerves that can enlarge as a result of neural involvement.

Loss of sensation, touch, or pain perception is used to measure sensory degradation over skin lesions. Before a sensory impairment becomes clinically evident, the lepra bacilli must infect 30% of the sensory nerve fibres.[9]

The pattern of reactions particularly type 1 reactions can leads to neuritis. Damage to the type C fibres that convey heat and cold discrimination, which is the first sense lost over the course of the disease, causes the glove and stocking pattern of sensory impairment. Then, the sense of pain is removed, followed by the sense of touch. Patients may experience anhidrosis if the sympathetic nerve is also affected.[10]

Leprosy reactions come in two main categories: Type 1 reactions involve the exacerbation of pre-existing lesions that result in an erythematous appearance, and type 2 reactions are immune complex mediated reactions that are characterized by systemic symptoms as well as newly developed erythematous subcutaneous nodules.[11]

The World Health Organization (WHO) created a grading system for disability in leprosy in 1960 and further updated it in 1988. In recent years, the prevention of disability has received increased focus under the leprosy control program. Governments and health care organizations are focusing their efforts right now on eradicating leprosy-related stigma. Their identification in society due to obvious deformities is one of the main causes of leprosy sufferers being stigmatized. Any impairment, activity restriction, or participation restriction affecting an individual is included under the umbrella term "Disability."

Physical disability in leprosy is defined by the WHO in three categories, WHO grading system.[12]

*Grade 0 — absence of disability (no anesthesia) and no visible damage or deformities on eyes, hands and feet.

*Grade 1 — loss of protective sensibility in the eyes, hands or feet, but no visible damage or deformities.

*Grade 2 — presence of deformities or visible damage to the eyes (lagophthalmos and/or ectropion, trichiasis, corneal opacity, visual acuity less than 0.1 or difficulty counting fingers at 6 meters), visible damage on hands or feet (hand with ulcerations and/or traumatic, resorption, claw, fallen hand, ulcers; feet with trophic and/or traumatic injuries, resorption, claw, foot drop, ulcers, ankle contracture).[13]

Disability frequency more specifically, the rate of WHO grade 2 disability (G2D)—has frequently been employed as an indicator for the severity of leprosy-related illness in the local population. [14]

The evaluation of disabilities is a major indicator of leprosy control. However, in our healthcare system, only G2D records (WHO) are regularly kept, despite the fact that Grade 1 assessment is more crucial in terms of preventing disability. Therefore, early detection of Grade 1 disability is crucial for limiting and mitigating disability. The sufferings of many leprosy patients will undoubtedly be lessened by the search for related causes. [15]

A multidrug therapy regimen has been recommended by the WHO for the treatment of leprosy according to age and the subdivision of these cases into paucibacillary and multibacillary forms. [16] The first-line therapies included rifampicin, clofazimine, and dapsone (diamino-diphenyl sulfone). Rifampicin and dapsone, were used to treat paucibacillary patients for a total of six months. While Rifampicin, Dapsone, and Clofazimine were used to treat multibacillary patients for 12 months. Under medical supervision, this medicine combination was given to all patients once a month. Because of few financial constraints clofazimine is not included in the National Hansen's Disease Program (NHDP) regimens in the United States, the suggested treatment plans last longer. [8]

Other medications used as a second-line treatment is clarithromycin, minocycline and ofloxacin. The prevention of dapsone resistance, a rapid decline in infectivity of infected people, and the low rate of recurrence and adverse responses are some of the benefits of multidrug therapy. [17] However, the length of the treatment and the practical challenges it poses make adherence a challenge to achieve the goal of therapy. Patients with leprosy who also have severe nerve damage, musculoskeletal issues, and abnormalities may face prejudice at school and issues with their social lives. As a result, early detection and treatment can minimize the illness, transmission and its effects in all levels of education. However, children find it challenging to swallow tablets and capsules, and they are unable to chew capsules, which can result in a therapeutic dose that is insufficient. [18] The present study gives an insight into the clinical and epidemiological profile of the leprosy patients at a tertiary care hospital, Tirupur.

2. Materials and Methods

This is a Retrospective Clinico Epidemiological Study which was Conducted at tertiary care centre in Tirupur district with a mixed, urban, rural and migratory population. Institutional ethical committee clearence was taken. Case records of all leprosy patients treated were obtained from leprosy OPD registration card maintained in the department of DVL for a duration of one year from March 2021 to April 2022 were studied retrospectively.

The Aim of this study is to describe the clinical spectrum and epidemiological profile and the type of MDT given for the leprosy cases treated at tertiary care hospital Tirupur.

The patients were diagnosed on the basis of clinical symptoms and signs and the diagnosis was confirmed by slit skin smear and skin histopathology for all doubtful cases. Records of the patients were analyzed for the following clinical and epidemiological parameters; such as Age, Sex, Marital Status, Location, Occupation, Family History, Contact History, Migration Status and Type of leprosy, Spectrum, Nerve involvement, Reactions, Disability, Type of therapy were collected using the proforma. Descriptive analysis was carried out from the data collected and analyzed using MS Excel.

3. Results

A total no. of 35 cases were collected for one year period from April 2021 – March 2022 and were included in the present study.

Out of these 35 cases recorded, 6% of leprosy cases were reported below the age of 18 and 26% of cases were comes under the age group between 46 – 59 years and 51% of cases were reported within the 18 - 45years of age and 17% of leprosy cases were recorded with more than 60 years. The maximum disease burden (51%) was seen in the age group of 18 – 45 (Figure1). No childhood leprosy was recorded.

The study population consists of 25 (71%) males and 10 (29%) females. Male: female ratio was found to be 2.5:1 and most commonly males were affected more. When analyzing the educational status of the affected patients it was found that 77% of patients were literate and 23% of illiterate was affected with leprosy. In this educational status of the patients, who gone to school, college and degree holders and commonly noted as literate (Table 1).

The changes in population demography, internal migration, and merging of urban-rural boundaries in developing countries are a few of the many factors attributed to the rise in leprosy cases recently. [19] Since Tirupur is an industrial area the number of migratory population was more but our study shows that local group was mostly diagnosed with leprosy (91%) and migratory group were reported only with 9% of the total cases recorded (Table1).

Sex wise distribution based on the type of spectrum of leprosy shows 40% of cases were recorded with lepromatous leprosy with 11 no. of. male cases and 3 no. of female cases, this study most commonly reported type was found to be lepromatous leprosy and followed by 28% of borderline lepromatous, 6% of mid borderline leprosy and 3% of tuberculoid leprosy and pure neuritic cases were recorded. The sex wise distribution on the type of leprosy shows that among male lepromatous were reported more followed by borderline tuberculoid and among female group borderline tuberculoid were reported more followed by

Table 1:

Details	No. of. Cases	Percentage
Sex		
Male	25	71%
Female	10	29%
Education		
Literate	27	77%
Illiterate	8	23%
Age		
Below 18 years	2	6%
18-45 years	18	51%
46-59 years	9	26%
above 60 years and older	6	17%
Migratory status		
Local group	32	91%
Migratory group	3	9%

Table 2:

Type of spectrum	Male	Female	Total	Percentage
Tuberculoid leprosy	1	0	1	3%
Borderline tuberculoid leprosy	6	4	10	28%
Mid borderline leprosy	2	0	2	6%
Borderline lepromatous leprosy	5	2	7	20
Lepromatous leprosy	11	3	14	40%
Pure neuritic hansen	0	1	1	3%

Table 3:

Clinical features	No. of Cases	Percentage
Nerve involvement		
Present	22	63%
Not present	13	37%
Reaction based classification		
Type 1 reactions	4	11%
Type 2 reactions	3	9%
No reactions	28	80%
Disabilities		
Grade 1	10	29%
Grade 2	4	11%
No disabilities	21	60%
Type of treatment		
MB MDT	31	89%
PB MDT	4	11%

lepromatous leprosy (Table 2). When leprosy is suspected and there are no skin lesions, a nerve biopsy specimen evaluation should be done as a confirming test in cases of pure neural leprosy [20,21].

In this study leprosy cases treated with MB MDT was 89% followed by 11% of PB MDT.

Erythema, edema, and neuritis are the symptoms of a type 1 leprosy reaction, which often manifests within the first two months of initiating treatment.

Prednisone is used to treat neuritis at a dosage of 40 to 60 mg/day; ideally, this medication should be stopped after a few weeks along with the maintenance of multi-drug therapy. [17,18,22,23].

Fever, nodules, musculoskeletal pain, arthralgia, neuritis, and dactylitis are symptoms of erythema nodosum. The onset of this illness often occurs during the first and second year, with periodic relapses. The preferred treatment is thalidomide, while prednisone or clofazimine may also be administered on occasion. For those who cannot take steroids, thalidomide is started at a dosage of 100 to 200mg. [6] Out of 35 cases 7 were recorded with reaction and 28 cases with no reactions.

In our study disabilities was reported with 14 cases (40%) in which grade 1 disability (29%) was more

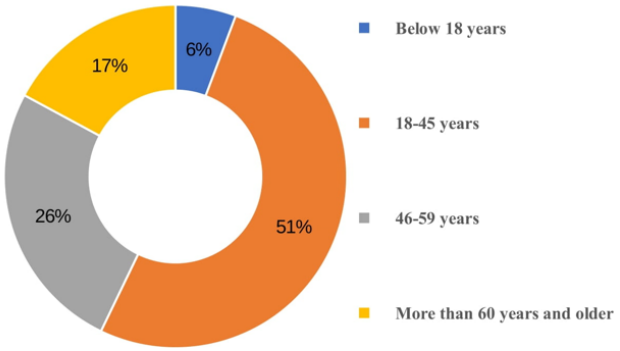

Figure 1:

comparing with grade 2 disability (11%).

In our study 22 cases (63%) were recorded with nerve involvement.

4. Discussion

A Retrospective Clinico Epidemilogical study was carried out over for a period of 1 year thereby collecting the data of leprosy patients over a period of (April 2021 – March2022) one year at the tertiary care hospital Tirupur in Department of DVL. The age wise distribution of current study shows that the patient within the age group of 18 – 45 years are mostly affected by leprosy. This shows that 51% of the total study population under 18 – 45 years of age were affected. Leprosy in the patient with age group was of the same proportion observed by other study conducted by Adil M et al.[24]

71% of male patient were affected more by leprosy followed by 29% of female population and no male and female child were reported within the study period. Our result coincides with the study by kalita JM et al.[5]

In our study sex wise distribution on the type of leprosy was more in the lepromatous leprosy which was contradict to the sudy conducted by vaishist D et al[1]$were$ borderline tuberculoid was more.The study result shows that local group was more affected when comparing it to the migratory group, thereby our study shows that leprosy cases was found to be less in migratory group it coincides with their report on comparing to the study conducted by Samuel P et al.[25]

Disbailities among the leprosy patients indicates possible huge burden of morbidity among leprosy patients the study shows that 29% of cases were recorded with GRADE 1 disability and 11% were with GRADE 2 disability and followed by 60% of cases with no disability were found these reports were contradict with the study conducted by Shravani B et al., in which they have reported GRADE 2 disabilited was reported highly Shravani B et al.[26]

In this sudy the leprosy reactions were documented out of 35 cases in which 11% of the cases were found to be recorded with type 1 reactions and followed by 9% of type 2 reactions and 80% of no reaction cases were recorded. This was contradictory to the majority of the previous studies where type 2 reactions are more commonly reported Arif T et al., Srinisha NL et al., Tegta GR et al., Patil A et al., Mahajan R et al.[27–32]

5. Conclusion

This study insights about that majority of the leprosy cases was observed in 18 – 45 years. Lepromatous leprosy was found to be more with no records of childhood leprosy. Type 1 reactions & grade 1 disabilities were recorded more in this study. MB MDT was the common regimen given for most patients.

Since the Tirupur is an industrial area where number of migratory population were more but our study shows that local group was mostly diagnosed with leprosy (91%) than migratory group in which 9% were reported.

Finally the present study provides an insight into the disease burden as well as the effectiveness of the health related services at a tertiary care hospital in Tirupur. The study also highlights the early diagnosis and management of leprosy and the importance of the surveillance activity, thereby minimizing the risks of leprosy in Tirupur.

6. Source of Funding

None.

7. Conflict of Interest

None.

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