DOI: http://doi.org/10.46632/jemm/8/1/8

REST Journal on Emerging Trends in Modelling and Manufacturing
Vol: 8(1), 2022
REST Publisher; ISSN: 2455-4537
Website: www.restpublisher.com/journals/jemm

Study on Prevalence of Leprosy in Man at Theni, Tamil Nadu

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Abstract. Background: Leprosy is chronic infectious systemic disease, is a major health problem in some regions, it may be considered an immunological disease. Objective: This work aimed to identify the stigma experienced by these patients. The main goal of this present study is to provide knowledge and health awareness about various health problems Method: Medical record of leprosy cases between Oct 2014 - March 2015 were analyzed at the Department of leprosy, Arokiyaagam, Aundipatty, Theni District. Data were obtained using a specific questionnaire, and entered into the database system. Conclusion: The results of this study point to a high circulation of lepra bacilli in the community in the "elimination era "and also highlight the need for early diagnosis and appropriate treatment at the field level to prevent spread of bacilli and development of disabilities.
Keywords: Leprosy, elimination, reaction, age group.

Introduction

Mycobacterium leprae was first identified in the coetaneous lesions of **leprosy** patients by Dr. Gerhard Armauer Hansen in 1873. Consequently, leprosy is also termed **Hansen's disease.** *M. leprae* is an acid-fast, bacilli-shaped bacterium, ranging from 1 to 8 μm (micrometers) length and roughly 0.3 μm diameter. Functionally, the bacterium is non-motile, aerobic, and cannot form spores, supporting its lifestyle as an obligate intracellular parasite - survival is unfavorable outside of host cells.Reproduction occurs by binary fission at approximate 10-to-14-day intervals, assuming an optimal growth condition of 27°C to 30°C, which explains why human infections occur at the extremities (wrist, ankle, etc.), and not warmer, internal locations. The temperature range also accounts for armadillos - body temperature of 28°C to 33°C being the only reservoir of the disease apart from humans (Worobec, 2009). The word signifying leprosy in different languages is: Aussatzm(German),Lepra (French),Lepra(Spanish),Pro-kaza (Russian), Mafuna(Chinese), Raibyo (Japanese), Judham (Arabic) and Kushtha (Hindi). Inmany languages leprosy is called "the great disease". (Nadeau, 2002; Ruddy, 2001). Leprosy has been called the "great imitator" and shares this nick-name with other conditions like syphilis and systemic lupus erythematosus. (Hastings Robert *et al*., 1985). It is indeed a proteiform disease with innumerable possible clinical frames. The clinical presentations are so many because of the combinations of many different primary skin lesions with or without signs of inflammation, sequelae of these lesions and signs and sequelae of peripheral nerve damage. (Rodriguez ,*et al*., 1931). The main limitation of this study is the small sample size, particularly among females. It is reasonable to assume that a bigger sample size could minimize the multicollinearity issue (Checkoway*et al*. 2004).

Methodology

Sample population: The data was collected from integrated counseling and testing center ArokyaAkam constituting 200 individuals (100 Positive and 100 Negative) belonging to various age group ranging from 19 – 60 years and they were classified into four age groups. Sample size: Among these 200 individuals, 50 leprosy Positive male individuals, 50 leprosy Positive female individuals, 50 leprosy Negative male individuals and 50 leprosy Negative female individuals were considered in the present investigations. Slit-skin smear: Leprosy is the only disease in which there can be a massive invasion of the dermis or nasal mucosa with acid-fast bacilli (AFB). In some forms of the disease bacilli are demonstrated in slit-skin smears or in nasal mucus or scrapings.Leprosy bacilli are extremely scanty in lesions of some forms of leprosy, but are present in enormous numbers in lesions of other forms of the same disease. One gram of skin tissue in lepromatous leprosy may contain as many as 7000 million leprosy bacilli (Yawalkar S.J 2002). The slit and scrape method: A fold of skin is picked up between finger and thumb and is squeezed to prevent blood flow. A small incision, 7-8 mm length and 1-2 mm deep, is made into the dermis with a scalpel blade. The blade is then turned through 90 degrees and used to scrape the cut surface of the tissue. Care has to be taken to avoid blood mixing with the smear. The juice obtained is smeared onto a slide with standard thickness and diameter and, allowed to dry. The slide is then "gently" flamed to fix the smear (VK Mahajan.2013). Staining and reading the smears: Smears are stained by Ziehl-Neelsen's method. After staining, slides are examined using a 100-x oil immersion lens. Bacilli are seen as red dots against a blue background. Living (viable) leprosy bacilli appear uniformly stained; they are described as solid-staining or "solids" (S) bacilli. Dead leprosy bacilli, that stain irregularly, are described as fragmented (F) and granular (G)(MManjyotGautamand Aditi Jaiswal.2019). Bacterial Index: Bacterial index (BI)is the only objective way of monitoring the benefits of treatment.

Negative	**No bacilli found in100 fields**
One plus (+)	one or less than on bacillus in Each microscopic field
Two plus (++)	Bacilli found in all fields
Three plus (+++)	Many bacilli found in all fields.

Ziehl-Neelsen Method: The bacteria are first stained with carbolfuchsin (primary stain) and then heated in a steam bath (mordant), allowing the stain to penetrate the cell wall. This is followed by the application of acid alcohol (a decolorizer) and, finally, methylene blue staining (counterstain). The acid-fast bacteria look red, while other structures take on the counterstain's blue-green color(Roberts *et al.*, 1991).

Result: One hundred and fifty-one leprosy patients were included in the research (Figure 1). The mean age of patients with 55 cases of female 29 (52.7 percent) cases and male 26 (47.3 percent) cases was discovered, with 55 instances of female 29 (52.7 percent) cases and male 26 (47.3 percent) cases. (Fig:1)

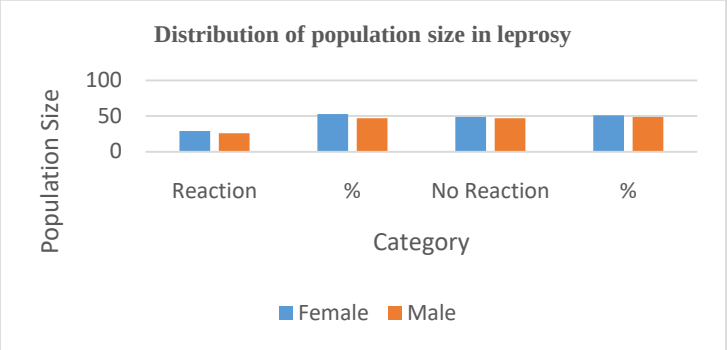

FIGURE: 1 Distribution of population size in leprosy

In terms of age, the majority of post-leprosy patients were between the ages of 40 to 49, and 50 to 59. Figure 2 illustrates the patients' major characteristics. The average age and number of contacts were equal in both genders, however female patients had a somewhat greater rate of leprosy responses.The prevalence plot for men and women based on the number of encounters. In men, the prevalence rises as the number of contacts increases, but in women, the trend was steady or declining.

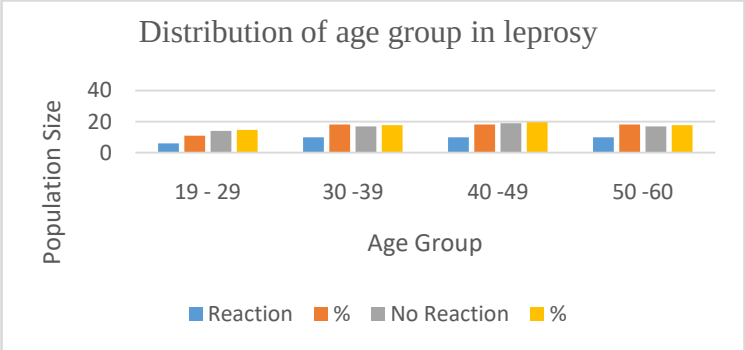

FIGURE: 2 Distribution of age group in leprosy

According to Figure 3, 36 (65.5 percent) of the new cases were multibacillary (MB), whereas 19 (34.5 percent) were paucibacillary (PB). Figure 4 depicts the presence of the Lepra response at the time of presentation; the frequency of type 1 reaction (26.01 percent) was more common than type 2 reaction (8.70 percent) among new patients. According to Figure 5, the most frequent kind of leprosy at the time of diagnosis was borderline tuberculoid16 (34.78 percent) leprosy, followed by tuberculoid leprosy 13 (28.26 percent).

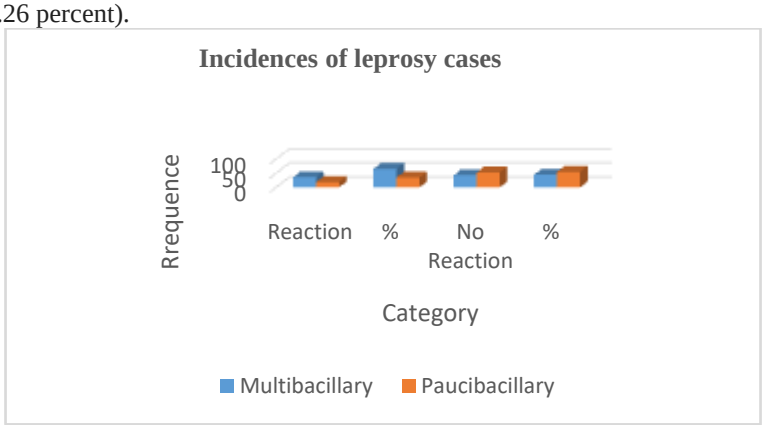

FIGURE: 3 Incidences of leprosy cases

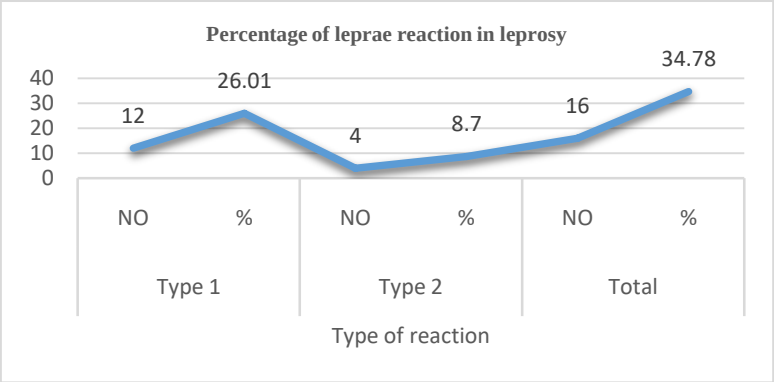

FIGURE: 4 Percentage of leprae reaction in leprosy

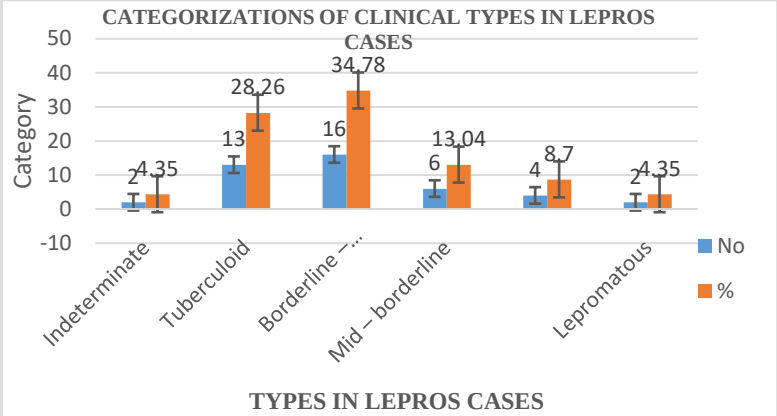

FIGURE :5 Categorization of clinical types in lepros cases

Discussion

Leprosy, also known as Hansen's disease, is a chronic infectious disease which is nonfatal, yet one of the most common causes of nontraumatic peripheral neuropathy worldwide. *Mycobacterium leprae*, the causative agent of leprosy, was discovered by G. H. Armauer Hansen in Norway in 1873, making it the first bacterium to be identified as causing disease in humans. (Mastrangelo *et al*. 2008) It is an intracellular acid-fast bacillus with an affinity for Schwann cells and skin macrophages. Man is considered the only natural reservoir of the bacillus, although there have been reports of naturally infected wild animals (armadillos and monkeys).(BrittonW.J, and Lockwood D.N 2004) Patients with the multibacillary forms of the disease are considered the principal source of infection; nevertheless, the role of paucibacillary forms in the chain of transmission has already been demonstrated. Multibacillary cases were more common (65.5%) among the new cases attending the out-patient department of our hospital in comparison with the paucibacillary (34.5%) cases. Males outnumbered females in our study group in concordance with (Sousa *et al.,2007*) (Table 3). The reason for this is generally considered to be the risk of exposure; however, the increasing number of cases among females is worthy of mention. Although some studies show that leprosy affects more men than women, there are exceptions such as in the study conducted by (Gomes *et al*., 1998). Where females outnumbered males. This small increase in the rates may be the result of an increase in the number of infected women or may be due to a more effective identification of these carriers(Reddy*et al.*, 1982). An improvement in the access of women to healthcare services and the fact that women are more concerned with their self-image than men could explain this increase in the identification of female cases. The studied group consisted of 55 patients (female and male). The interviewees' age varied from 20 to 80 year. As for marital status, (67%) were married, (11%) were separated and one (27%) was a widower. Regarding education level, (50%) patients had between 10 and 12 years of study, (26%) between one and nine years of study and one (3%) did not have any education. No participant had any graduation. Regarding occupation, eleven (44%) Were laborers seven (7%) wereunemployed and two (10%) were pensioners (Wilson 2005). After analyzing the interviews, we identified the following categories: (1) The changes that occurred in the family after the diagnosis of Hansen's disease; (2) The attitude of neighbors and co-workers to the diagnosis of Hansen's disease; (3) The consequences in the patient's social life.(Table 5,6). This dreaded disease is supposed to have existed in India and China from ca. 4000 B.C., but this dating is very difficult to establish factually. Kinnier Wilson suggested that leprosy may have been the incurable skin condition mentioned in an Old Babylonian omen tablet, since the symptoms include loss of skin pigment, odor, and an apparent outbreak of papulesAlthough serious skin diseases were known to both the Sumerians and the Babylonians, it is impossible to ascertain whether any of the technical terms in the various texts refer to leprosy. But probably the Mesopotamians did become familiar with leprosy during the 3rd millennium B.C. Thus, we noticed the prevalence of these symptoms both in the group of elderly patients after leprosy treatment, as well as in the control group.

According to studies by (Silva *et al*.,1998) smoking and the reduced intake of liquids are some of the main harmful habits which can impair vocal production, as well as worsening pre-existing lesions such as leprosy, for instance. In this context, the studies of the life styles of these patients from both groups have fundamental importance. Most people with RLS face difficulty falling asleep and staying asleep leading to exhaustion and daytime fatigue. Sleep deprivation strongly affects personal relations, and cumulatively become a cause of depression.RLS affects both the sexes though women are twice as likely to suffer then men. All age groups are affected, but the symptoms are more frequent, more severe and tend to last for a longer period of time in middle-aged or older people. The prevalence of RLS in the general population has been reported as varying between 1.9% and 15%.Various underlying diseases known to cause RLS include iron deficiency anemia, megaloblastic anemia (vit B12 deficiency), kidney failure, diabetes, rheumatoid arthritis and parkinsons disease, multiple sclerosis and venous insufficiency. Treating the underlying condition often provides relief from RLS symptoms. Throughout this discussion, we can notice that most of the patients in the control group stated not being a smoker, drinking more than 2 liters of water per day and stated they never drank alcoholic beverages .Therefore, most of the group kept their life styles, mentioned in the literature as prophylactic for vocal symptoms and laryngeal lesions; it can then be concluded that the habits of these patients were not capable of justifying the symptoms they presented. Notwithstanding, besides life style, the literature indicates other factors which can be responsible for vocal symptoms in these patients

Conclusion

Public education and community awareness are crucial to encourage individuals with leprosy and their families to undergo evaluation and treatment with MDT. Household contacts of patients with leprosy should be monitored closely for the development of leprosy signs and symptoms.The high prevalence of lost warm sensation in the leprosy – affected cohort suggests that this is an important early indicator for nerve involvement in leprosy. The results of this study point to a high circulation of lepra bacilli in the community in the "elinmination era"and also highlight the need for early diagnosis and appropriate treatment at the field level to prevent spread of bacilli and development of disabilities.

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