Prevalence of Leprosy " A five Years study" in a Tertiary care Hospital in Ludhiana.

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ABSTRACT

A five-year study was conducted in the Department of Microbiology, Christian Medical College and Hospital, Ludhiana from January 2005 to December 2009. A total of 105 samples were examined. For each patient six to eight smears were prepared from various sites of lesions. These were examined microscopically following modified Ziehl-Neelson staining. Overall positivity rate was 27.61% with the least prevalence (16.66%) in the year 2009.

KEY WORDS: **Leprosy, Mycobacterium leprae, Modified Ziehl Neelsen Staining, bacteriological Index and Morphological Index.**

INTRODUCTION

Leprosy is a disease of great antiquity, having been recognized from Vedic times in India and from Biblical times in the Middle East. It probably originated in the tropics and spread to the rest of the World[1] Leprosy, also known as Hansen's disease, is caused by Mycobacterium leprae. A Norwegian physician named Gerhard Armauer Henson discovered the bacterium in 1873. M. leprae is gram positive, acid fast, arobe and thermolabile. It has a good natural resistance as can remain viable in warm humid environment for 9-16 days and is moist soil for 46 days. It survives exposure to direct sunlight for two hours and ultraviolet light for 30 minutes[1]. It divides slowly, the generation time being 12-14 days. Consequently, leprosy in humans evolves very slowly and primary infects skin. Peripheral nerves and nasal mucosa causing a chronic granulmatcus disease. Buth the pathogens are capable of affecting any organ or tissue in the body.

Though it was the first bacterial pathogen of human beings to be described. It remains one of the least understood, as it cannot be grown on artificial culture media[2]. Moreover the epidemiology of leprosy remains incompletely understood because of a long and variable incubation period of the disease. Leprosy was described as Kushta in Sushta Samhita written in 600 BC in India [2]. The disease still afflicts a significant number of people. There are about one million persons with acute disease and about 6,85,000 new cases annually throughout the world [3].

Based upon clinical, histopathological and immunological findings, Ridley and Jopling scaled the spectrum of leprosy into five groups. These are:

1. Tuberculoid (TT)
2. Borderline Tuberculoid (BT)
3. Borderline (BB)
4. Borderline lepromatous (BL)
5. Lepromatous (LL)

According to WHO, leprosy is divided into two groups. Paucibacillary & Multibacillary. Paucibacillary leprosy includes all cases of tuberculoid types and some cases of Borderline type. Multibacillary group includes all cases of lepromatous type and some cases of borderline type[2]. The presence of acid fast bacilli in the smears has long been considered as one of the cardinal signs of leprosy, sufficient on its own to establish the diagnosis. In 1982, the World Health organization recommended the use of multidrugtherapy as standard treatment for leprosy and introduced an operational classification of leprosy distinguishing between paucibacillary and multibacillary forms based on the result of the slit skin smear[4].

The clinical form of disease is determined by the degree of cell-mediated immunity (CMI) expressed by that individual towards M.leprae. High levels of CMI with elimination of lepra bacilli produce

tuberculoid leprosy, whereas absent CMI results in lepromatous leprosy [5]. The severity of the disease depends on degree of nerve damage & bacillary infiltration. Nerve damage leads to considerable morbidity and thereby stigmatization of the patients. In the lepromatous form, the organism multiply unchecked and at times the entire skin surface can be involved yielding a diffuse, waxy appearance. Anterior chamber of eye, the upper airway and the testes are the other cool tissue often involved. Untreated lepromatous leprosy is relentlessly progressive.

MATERIAL & METHODS

This study was conducted in the Department of Microbiology, Christian Medical College and Hospital, Ludhiana over a period of 5 years commencing from January 2005. All the patients suspected of leprosy, visiting or referred to this tertiary care centre, were included in this study irrespective of their age or sex. Six to eight smears were prepared from various lesions for each patient. The specimens were collected from nasal mucosa, ear lobules and edges of skin lesions on forehead, arms, thighs and buttocks. For collecting the specimen from nasal mucosa, a blunt narrow scalpel was introduced into the nose and mucous membrane was removed by scraping the internal septum. For skin lesions, samples were collected from the edges by making a cut about 5mm long and of enough depth to reach infiltrated layers. Then tissue pulp was collected by scraping the sides and bottom of the cut. The smears were heat fixed and stained by modified Ziehl Neelsen staining using 5% H_2 SO_4 for declorisation instead of 20%. The smears were examined under oil immersion objective and the bacteria were found to be slender, slightly curved or strait. The live bacilli stained uniformly and appeared solid, whereas the dead ones were seen as fragmented and granular. The bacilli were arranged singly or in groups called as globi. Bacteriological and morphological indices were calculated using standard techniques. The smear was graded, based on the number of bacilli is given below:

1– 10 bacilli per 100 fields =1+
1– 10 bacilli per 10 fields = 2+
1– 10 bacilli per field = 3+
10 –100 bacilli per field =4+
100– 1000bacilli per field = 5+
More than 1000 bacilli **or**
Clumps or globi per field = 6+

The bacteriological index was obtained by totaling the number of pluses scored in all the smears and dividing the figure by the number of smears examined. The morphological index was expressed as the percentage of uniformly stained bacilli out of the total number of bacilli counted.

RESULT

The rate of prevalence of leprosy varied between 16.66% to 28.12%. It has been depicted in Table -1. There is no uniform pattern as per its rise or fall. In our study, most of the positive cases had bacteriological indices lying between 2 and 5, whereas morphological indices varied from 10% to 50%. Leprosy is a chronic mycobacterial disease of the ancient world. It still afflicts patients in many parts of the world, mainly Asia and Africa[2]. In United States, however fewer than 200 new cases appear each year, and most of these cases occur in immigrants from endemic areas[6].

Leprosy is a chronic granulomatous disease of humans with patients being the only source of infection. Due to preference of bacilli for lower temperatures, the superficial and cooler tissue like skin, peripheral nerves and nasal mucosa are affected. The sources of infection are nasal discharge and skin lesions of patients. But a prolonged intimate contact appears to be necessary for transmission by cutaneous inoculation[7]. This study conducted over a period of 5 years the overall positivity rate of leprosy comes out to be 27.61%. The minimum positivity percentage (16.66%) was seen in the year 2009 and the maximum incidence (28.12%) was noticed in the year 2005. In a previous study conducted in the same institution over a period of six years a similar prevalence pattern was observed [8].

The altering prevalence is attributed to the influx of migrant population in Ludhiana, which is an industrial city. In Ludhiana we come across many migrants from other states mainly Uttar Pradesh, Madhya Pradesh, Jharkhand, Orissa, West Bengal and Chhattisgarh.

DISCUSSION

These migrants work in various industries and live in small overcrowded quarters. Also they do not have access to potable water and there is no sewerage facility. All these factors breed leprosy and help it to spread fast.

Some 4 million people have been disabled by leprosy worldwide. About 70% of the world's leprosy patients live in India with Brazil, Indonesia, Myanmar, Medagascar and Nepal being the next most endemic countries[4]. There are high rates of childhood cases with a peak at 10 – 14 years and an excess of male cases has been regularly found[4]. In our study also we found children contributing 55.10% of the positive cases with a male prevalence of 75.51%.

Migrants keep on moving from one place to another and all do not come for checkup. So this study is not depicting the true prevalence. It is an underestimate of actual prevalence in Ludhiana. On observing year wise prevalence we find wide variation in the figures. On comparing couple of figures in the consecutive years 2008 and 2009, we find encouraging results with a fall of 10 percent prevalence rate. But still overall prevalence of leprosy is higher in this study as compare to the previous study. We need to work more on cessation of various factors that promote spread of this infection.

The sensitivity and specificity of clinical criteria in various studies are stated with reference to the bacteriological status as the Gold standard[9]. The WHO system of classifying leprosy patients as MB patients based on number of skin lesion is simple to apply and has a reasonable balance between sensitivity and specificity[10].

Prevalence of Leprosy in Ludhiana

Year	*Total No. of Patients investigated*	*No. of positive cases*
2005	*32*	*09(28.12%)*
2006	*22*	*06(27.27%)*
2007	*24*	*08(33.33%)*
2008	*15*	*04(26.66%)*
2009	*12*	*02(16.66%)*
05	***105***	***29(27.61%)***

TABLE -1

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