



The demographic and clinical characteristics of leprosy in Saudi Arabia



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Summary Leprosy is a chronic disease caused by *Mycobacterium leprae*. Although the occurrence of leprosy has declined in Saudi Arabia, it has not yet been eradicated. To our knowledge, this descriptive retrospective study is the first to assess the clinical presentation of leprosy at the time of diagnosis in Saudi Arabia. All study subjects were leprosy patients admitted to Ibn Sina hospital, the only referral hospital for leprosy in Saudi Arabia, between January 2000 and May 2012. A total of 164 subjects, the majority of whom (65%) were between 21 and 50 years of age, were included, and the male-to-female ratio was 2.8:1. Of these 164 patients, 63% were Saudis, and 77% of all admitted patients were from the western region. Lepromatous leprosy was observed most frequently (33%), and 31% of cases had a positive history of close contact with leprosy. At the time of diagnosis, 84% of all subjects presented with skin manifestation. The prevalence of neurological deficit at the time of diagnosis was 87%. Erythema nodosum leprosum (E.N.L.) developed in only 10% of all subjects. Further studies are needed to determine the clinical characteristics pertaining to each type of leprosy in the region, and training courses in caring for and diagnosing patients with leprosy should be organized for health workers.

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Introduction

Leprosy is a chronic disease caused by *Mycobacterium leprae* [1]. *M. leprae* is similar to *Mycobacterium tuberculosis*, although it is resistant to culture [1]. It is an intracellular microbe that prefers to infect cooler areas of the human body, including the skin and nerves [2]. Dermatological lesions and peripheral neuropathy are the cardinal clinical features of leprosy [1]. Most cases of leprosy have been reported in developing countries [1]. Leprosy is a curable disease if detected in early stages, and early detection is critical for the prevention of disabilities [1]. In the United States, approximately 75% of new cases were detected in immigrants in 2010 [3]. Most leprosy patients in the USA were affected by lepromatous leprosy [3]. Of diagnosed leprosy patients in Saudi Arabia, 57% are immigrants, and leprosy is more common in males than females at a ratio of 3–1 [4]. Regarding the epidemiology in Saudi Arabia, Assiri et al. reported the occurrence of 242 new leprosy cases over a 10-year period spanning 2003–2012 [4]. The risk of leprosy was higher in older individuals. In one study, the risk of contracting the disease was found to increase between the ages of 5 and 15 years and increased again after the age of 30 [5]. The disease is transmitted from one person to another through close contact [6], which in the case of leprosy, may mean skin-to-skin contact or exposure to a patient's oral droplets [7]. Some studies have suggested that patients with a history of contact with multibacillary leprosy have a higher risk than patients in contact with paucibacillary leprosy [6]. The disease is thought to be transmitted through nasal discharge, but the exact mechanism of transmission is not fully understood [8].

According to the Ridley and Jopling classification system, there are five types of leprosy: lepromatous (LL), tuberculoid (TT), borderline borderline (BB), borderline lepromatous (BL) and borderline tuberculoid (BT) [9]. Ridley and Jopling have also used the term indeterminate leprosy (IL) [10] when a biopsy sample shows evidence of leprosy without a clear clinical manifestation [10]. Patients with evidence of neurological deficits or damage without any skin manifestations are considered to have pure neural leprosy [11]. Another classification system for leprosy was developed by the World Health Organization (WHO). The WHO divides leprosy into two types: paucibacillary (includes TT, BT and IL) and multibacillary (includes LL, BL and BB) [12]. There are two types of systemic reactions to leprosy. Type 1 reactions (i.e., reversed reactions) occur in patients with borderline leprosy (i.e., borderline borderline, borderline lepromatous and

borderline tuberculoid), whereas type 2 reactions (i.e., erythema nodosum leprosum or ENL) occur in patients with lepromatous and borderline lepromatous leprosy [2]. ENL presents with red painful nodules on the skin, which mostly develop later in the course of the disease [13]. The management of ENL compromises prolonged courses of prednisolone [13]. If the disease is severe, then thalidomide may be used [14]. The aim of this study is to determine the demographics of patients admitted with a diagnosis of leprosy and to assess and compare neurological deficit (e.g., sensory or motor loss, nerve enlargement or anesthetic lesion), skin manifestation (e.g., hypopigmented lesions, plaque or macule) and erythema nodosum leprosum in various leprosy types in Saudi Arabia. Because of the need for clinical indicators to aid primary healthcare physicians in the early detection of the disease, we focused our efforts on quantifying the types and characteristics of leprosy found in Saudi Arabia. To our knowledge, this is the first study to assess the clinical presentation of leprosy at the time of diagnosis in Saudi Arabia.

Methodology

This is a descriptive retrospective study. The subjects of this study were all patients diagnosed with leprosy at Ibn Sina Hospital between January 2000 and May 2012. The study was conducted in Ibn Sina Hospital, which is a leprosy referral hospital in the Makkah region. In total, 164 subjects were enrolled. Twelve subjects were excluded from our study due to insufficient file information.

Patient information and data, including age, sex, nationality, area of residence, year of registry, type of the disease and signs and symptoms at the time of diagnosis, were collected from the patients' files. The data were categorized according to the Ridley and Jopling classification [9]. The diagnosis of leprosy was based on clinical manifestations in addition to a skin smear, which was obtained for all patients and examined in a laboratory to determine the type of leprosy. The data were transferred to coding sheets and were entered into an Excel file. The data were analyzed using SPSS version 16. Qualitative variables are categorized and presented as frequencies and percentages. Quantitative variables are presented as the mean and standard deviation. Categorical variables were compared using the chi-square test, odds ratio and a 95% confidence interval. A *P* value <0.05 was considered significant. Openepi, which is a free web-based statistical program, was used to calculate the *P* value, odds ratio and confidence

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