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Prevalence of Tuberculosis and Non Tuberculosis Mycobacterium in Zahedan, Southeast of Iran*

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Abstract: In the present study we have investigated the prevalence of tuberculosis and non tuberculosis Mycobacterium. Our results showed that 60 of 150 samples of sputum positive were cultured positive. The results showed that 66.7% (40/60) *Mycobacterium tuberculosis*, whereas 33.3% (20/60) were non tuberculosis mycobacterium. We also found that 3.33% (2/60) were *Mycobacterium kansasii* (MK) and 1.67% (1/60) *Mycobacterium avium* complex (MAC) and 28.33% (17/60) were other types. In conclusion, the percentage of *Mycobacterium tuberculosis* was significantly higher than that of the non tuberculosis Mycobacterium.

Key words: Tuberculosis, non tuberculosis, Mycobacterium

Introduction

Mycobacterium infections are divided into *Mycobacterium tuberculosis* (TB) and non tuberculous mycobacteriosis (NTM). *Mycobacterium avium*-intracellulare complex (MAC) is the most common among NTM capable of causing disease in humans. *Mycobacterium avium*-intracellulare complex (MAC) is a ubiquitous environmental microorganism whose pathogenicity ranges from innocuous colonization to disease, in immunocompetent as well as immunocompromised individuals (Epstein *et al*., 1997). The immune response to mycobacterial infection is predominantly cellular (Daniel, 1980).

Tuberculosis (TB) remains a leading infectious cause of death and a leading public health priority in the world (Wand, 2003). The World Heath Organization (WHO) estimates that there are more than 8 million new cases of TB each year and that one-third of the world population is infected with the *Mycobacterium tuberculosis* and at risk of active disease (Dye *et al*., 1999). Detection of Acid Fast Bacilli (AFB) from a clinical specimen frequently poses a challenge for the initiation of treatment, before a culture is available.

The purpose of this study is twofold: first, to determine the concordance between smear positive and culture for diagnosis of Mycobacterium; second, to evaluate the prevalence of *Mycobacterium tuberculosis* and non tuberculosis in sputum positive in the Bou-Ali Hospital, Zahedan, Iran.

Materials and Methods

One-hundred fifty patients who visited Bou-Ali Hospital of Zahedan in 2004 were studied. None of them had been previously treated for TB before visiting our hospital. All patients had chest radiographic and/or CT scan. Sputum samples were stained with Ziehl-Neelsen stain and cultured for Mycobacteria. Cultures were quantified from zero to 4+ using the published standards. Mycobacteria

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were identified and differentiated by growth characteristics and conventional biochemical tests (Hawkins *et al*., 1990). The patients had negative serologic findings for Human Immunodeficiency Virus (HIV).

Results

Out of the 150 sputum positive patients enrolled in this study, 40% less than 50 and 60% were greater than 50 years old. Cultured of sputum showed that 60 of 150 (40%) cases of sputum positive were cultured positive. Mycobacterium were identified and differentiated by growth characteristics and conventional biochemical tests. Present results showed that 66.7% (40/60) were *Mycobacterium tuberculosis*, whereas 33.3% (20/60) were non tuberculosis mycobacterium. We also found that 3.33% (2/60) were *Mycobacterium kansasii* (MK) and 1.67% (1/60) *Mycobacterium avium* complex (MAC) and 28.33% (17/60) were other types. Overall incidences of *Mycobacterium tuberculosis* were significantly higher than that of the non tuberculosis Mycobacterium ($p<0.05$).

Discussion

The term tuberculosis (TB) refers to infection with the bacterium *Mycobacterium tuberculosis* that has progressed to active disease. This disease is a public health threat because it is caused by a microorganism that is potentially fatal for humans and transmission is commonly through the inhalation of airborne droplets expelled by infectious persons with active disease. Mycobacterium species has a specific morphology when grown in liquid medium (Tu *et al*., 2003). *Mycobacterium avium*-intracellulare complex (MAC) is a ubiquitous environmental microorganism whose pathogenicity ranges from innocuous colonization to disease, in immunocompetent as well as immunocompromised individuals (Epstein *et al*., 1997). *Mycobacterium tuberculosis* (TB) and *Mycobacterium avium* Complex (MAC) are both common opportunistic infections. Atypical Mycobacterium such as *Mycobacterium avium*-intracellular and *Mycobacterium kansasii* primarily cause lung disease similar to pulmonary tuberculosis. Clinical features of *Mycobacterium avium*-intracellular is most common non-tuberculous mycobacterial infection associated with AIDS. Symptoms include fever, swollen lymph nodes, diarrhoea, fatigue, weight loss and shortness of breath. *Mycobacterium kansasii*, may cause a chronic infection of the lungs similar to pulmonary Tuberculosis.

In the present study we found that 66.7% (40/60) were bacterium Tuberculosis and 33.3% (20/60) were non tuberculosis mycobacterium. In non tuberculosis Mycobacterium 3.33% (2/60) were *Mycobacterium kansasii* (MK) and 1.67% (1/60) *Mycobacterium avium* Complex (MAC) and 28.33% (17/60) were other type. Barnes *et al*. (2004) reported that in 716 culture positive cases, 684 (95.5%) were due to *Mycobacterium tuberculosis* complex and 32 (4.5%) to atypical mycobacterium. Seventy-five percent of these patients were affected by *M. avium* complex, 15.6% by *M. fortuitum*, 3.1% *Mycobacterium kansasii* and 6.3% *Mycobacterium chelonae* (Barnes *et al*., 2004). Martin *et al*. (2002) showed that the predominant isolates was *Mycobacterium avium*-complex (MAC) (60%) and *Mycobacterium tuberculosis* (21.3%) from cultured of 117 patients. A study from India showed that from 86 cultured, 15 (17.4%) were atypical Mycobacterium and the remaining 71 (72.8%) were *Mycobacterium tuberculosis* (Karak *et al*., 1996).

In patients with tuberculosis-like symptoms, the question addressed is whether the patient should be treated for miliary tuberculosis or for disseminated atypical mycobacterium infection pending further evaluation.

In summary, we found that only 40% of sputum positive was cultured positive for tuberculosis and the incidences of *Mycobacterium tuberculosis* were significantly higher than that of the non tuberculosis Mycobacterium.

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