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SHORT REPORT

# Latent tuberculosis infection in healthcare workers at a community hospital in Qatar

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## KEYWORDS

Latent tuberculosis;  
Mantoux test;  
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Cuba

**Summary** Routine screening of latent tuberculosis infection (LTBI) is recommended as an essential component in the prevention of TB transmission in healthcare facilities.

**Objective:** To determine the prevalence of LTBI among healthcare workers (HCWs) in a community hospital.

**Methods:** A descriptive study was carried out at The Cuban Hospital from August 2012 to May 2013 for newly hired medical staff. As part of the preemployment evaluation, the tuberculin skin test (TST) and QuantiFERON-TB Gold In-Tube test (QFT-G) were performed. The information regarding the demographics, profile, experience as HCWs, any previous contact with TB patients and travels abroad were collected.

**Analysis:** Test of independence, Student's *t* test and Wilcoxon Mann–Whitney were used. For hypothesis testing, a significance level of 0.05 was adopted.

**Results:** TST results were positive in 14 subjects (6.9%), of which 11 were nurses, and 12 were females. QFT-G results were positive in six subjects (3.0%), who were older than those with negative results (44.5 vs. 38.9 years) and had more experience as HCW (21.7 vs. 16.8 years). Compared with subjects negative for QFT-G, positive subjects reported a higher frequency of both direct contact with tuberculosis patients (83.3% vs. 25%) and previous travels to countries with high TB incidence.

**Conclusion:** Incidence of LTBI was low, especially when QFT-G results were considered, highlighting the history of traveling to countries with high TB incidence as an associated key factor.

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## Introduction

As the risk of tuberculosis (TB) infections for healthcare workers (HCWs) is higher than in the general population, routine screening is recommended [1,2]. The risk of transmission in healthcare facilities is related to the local prevalence of TB, the characteristics of the patient population and the effectiveness of TB infection control programs [2]. Screening programs using the tuberculin skin test (TST) or the QuantiFERON TB Gold In-Tube test (QFT-G) have identified the incidence of latent tuberculosis infection (LTBI) in different settings in Spain (11.2%), India (50%), Korea (51%) and England (7.6%) [3–6].

According to the World Health Organization (WHO) data, in Cuba, the incidence of tuberculosis infection is 6.1 cases per 100 000 inhabitants [7], which is considered a low incidence rate. In HCWs, two studies have shown LTBI prevalence of 15.4% in a General Hospital and 50% in a hospital dedicated to TB management [8,9]. Other data report LTBI of 26.6%, 28.8% and 31.5% in hospitals of La Habana City (Borroto S. Institute of Tropical Medicine Pedro Kouri, La Habana, 2013, unpublished).

The aim of this study was to assess the prevalence of LTBI among the Cuban medical staff at a community hospital in Qatar.

## Methods

A descriptive study was carried out at The Cuban Hospital, a community healthcare facility member of Hamad Medical Corporation, the largest healthcare provider in Qatar. According to the national laws and regulations, during the hiring process, all HCWs should undergo a mandatory medical evaluation to rule out infectious diseases such as tuberculosis, viral hepatitis and others.

Tuberculin skin test (TST) was performed by trained nurses according to the WHO standard Mantoux technique, using 2 tuberculin units (0.1 ml) of purified protein derivatives RT 23. The test was read 72 h later using 10-mm diameter as the cut-off point. QuantiFERON-TB Gold In-Tube test (QFT-G) was performed in those with a positive TST test, considering the 0.35 IU/mL concentration of IFN- $\gamma$  (interferon gamma) as the negative/positive cut-off to confirm LTBI. To rule out active tuberculosis, lung X-ray was performed; if needed, sputum for acid-fast bacilli identification was also performed.

The age, sex, category and information regarding experience as HCW, previous contact with TB patients (defined as contact within

conversational distance with a patient who had a smear-positive case or clinical evidence of tuberculosis) were collected. Information on previous travels to other countries was obtained as part of the medical evaluation. The countries were categorized according to TB incidence as low (<50 cases/100 000 population) and high ( $\geq$ 50/100 000 population) [7].

## Data analysis

Percentages and mean and standard deviation were calculated for qualitative and quantitative variables, respectively. The data were used to test the null hypothesis  $H_0$  of no association between each of the possible risk factors studied (qualitative variables) and the presence of latent tuberculosis. For the same purpose, in the quantitative variables Student's  $t$  test and Wilcoxon Mann–Whitney were used, respectively, for the "age" and period working in public health. For hypothesis tests testing the significance level was 0.05.

## Results

Of the 202 HCWs with pre-employment evaluation, 128 (63.4%) were nurses, 42 physicians and 32 technicians, with a mean age of 39.0 years (with a standard deviation of 6.5 years), and 144 (71.3%) were females. The staff had 17.0 ( $\pm$ 7.2) years of experience in healthcare, and 27% had direct contact with patients with suspected or confirmed tuberculosis, with contact occurring between 5 and 10 years before for 36 HCWs, within the last five years for 11 HCWs and more than 10 years before for seven HCWs. The percentage of HCWs that traveled outside, mainly for work, for a minimum of one year was 46.8%.

TST results were positive for 14 subjects (6.9%), of which 11 were nurses and 12 were females. Previous contact with patients with tuberculosis was reported by five HCWs (35.7%), and of the nine HCWs that had traveled abroad, seven had gone to countries with a high incidence of tuberculosis.

QFT-G results were positive in six subjects (3.0%), including three nurses and two physicians, and five (83.3%) of the positive subjects were females. It is remarkable that the HCWs with positive results were older than those with negative results (44.5 vs. 38.9 years) ( $p < 0.05$ ) and had more experience as HCWs (21.7 vs. 16.8 years) ( $p > 0.05$ ). Positive subjects mentioned more frequently that they had had direct contact with tuberculosis patients (83.3% vs. 25%) ( $p < 0.05$ ) and

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