

Prevalence of Latent Tuberculosis among Hospital Administrative Staff in Kuala Lumpur

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ABSTRACT

In the United States, there were about 10 to 15 million people with latent tuberculosis infection (LTBI) who are asymptomatic, particularly among healthcare workers (HCWs). The aim of the study was to determine the prevalence of LTBI among the HCWs in a main general hospital in Malaysia. About 401 HCWs have been enrolled in this cross sectional study conducted in November 2014 until January 2015. A standardised questionnaire was used to obtain their demography and job description together with Tuberculin skin test (TST). The prevalence of LTBI in the institution was about 46.4%, which was high. It was common amongst a younger age group and male HCWs. The noble finding was the study proved that the administrative type of work in a clinical setting has the highest prevalence and risk (adjusted OR=5.366; 95% CI=1.397-20.619) compared to others. Non-clinical HCWs like administrator should be treated as one of potential job for TBI in any hospital or clinic. Any programme on TBI awareness and prevention should include them too.

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1. INTRODUCTION

Tuberculosis as one of the most dangerous infectious agents, second after the human immunodeficiency infection virus (HIV). In 2012, about 8.6 million people infected with tuberculosis (TB) and 1.3 million died from it [1]. And about one-third of the world's population has latent TB infection (LTBI), which means they have been infected with TB bacteria but are not yet ill with the disease [2]. Among some of the most vulnerable population to this resurgence of TB infections are healthcare workers (HCWs) as they are on the front line of being exposed to diseased patients who are often asymptomatic in the early stage and do not know that they have the disease [3],[4]. And various studies revealed the increased number of LTBI amongst HCWs [5]-[7].

In detection of TB infection, the Tuberculin Skin Test (TST) is still being used everywhere, although its reliability was questionable [8]-[10]. In Malaysia, it is the standard testing kit for TB and made available at all government hospitals. However, not all HCWs in the government sector are screened for LTBI. Thus the study was carried out, for the first time, to ascertain the prevalence of LTBI amongst healthcare workers in one of the main general hospital using TST as well as to determine their associated factors.

2. RESEARCH METHOD

This cross sectional study was conducted between November 2014 until January 2015 among 401 permanent healthcare workers in a government general hospital. The respondents were selected from the administrative list using simple random sampling. Each of them was asked to answer a standardised questionnaire and undergo TST. The questionnaire includes demographic and co-morbid information. For TST reading, three occupational nurses were sent for a TST administration and reading course conducted by a local recognised Institute of Respiratory Medicine for one week. Written consent was obtained from each respondent before the enrollment. The data were analysed using SPSS statistics version 21.0 (SPSS, Chicago, IL, USA) with the significant point of $p < 0.05$. The study has received ethics approval from the Medical Research and Ethics Committee of Ministry of Health, and from the National University of Malaysia committee.

3. RESULTS AND ANALYSIS

A total number of 401 HCWs was involved in this study as shown Table 1. The majority of them aged between 20 to 29-year-old (51.7%), followed by the middle age group of 30 to 49-year-old (39.6%), and senior group of HCWs (8.7%) aged more than 50 years. Most of them were female HCWs (78.8%). More than half (54.9%) of the respondents work in the allied health sector, such as medical assistants, staff nurses, sisters and matrons, and assistant pharmacists. Only about 4.2% of the enrolled respondents work in the administrative sector, such as clerks and admin officers.

Table 1. Respondents' baseline characteristics

Variable	Value (%)
n	401
Age group (year), n (%)	
20-29	207 (51.7)
30-39	77 (19.2)
40-49	82 (20.4)
> 50	35 (8.7)
Gender, n (%)	
Male	85 (21.2)
Female	316 (78.8)
Job description, n (%)	
Professional	39 (9.7)
Allied Health	220 (54.9)
Support staff	125 (31.2)
Administration	17 (4.2)
Workplace, n (%)	
Medical wards	79 (19.7)
Surgical wards	60 (15.0)
Clinic / Pharmacy	66 (16.5)
Emergency / Operation Theater	140 (34.8)
Intensive care units	22 (5.5)
Admin office	34 (8.5)

The prevalence of LTBI among the respondents was 46.4%. In comparison, of LTBI occurrence in between the respondents age groups, the age group member of 30 to 39-year-old have the highest percentage of 48.1% as shown in Table 2. The second highest was among the youngest age group members with a prevalence of 46.4%, followed by the senior group (45.7%) and less senior group (45.1%). The differences were significant with $p < 0.01$, in which the prevalence of LTBI was obviously high among the young HCWs. And again, it was significantly higher in male compared to female HCWs, 47.1% and 46.2% respectively. Those involved as health administration, the study found a prominent high percentage of LTBI occurrence among them (70.6%) compared to other job descriptions. In addition, those who only work in the admin office were also found positive with LTBI (55.9%) which is the highest rate compared to other work site or place.

Variables like age groups and gender give two times higher risk, but were not significant ($p > 0.05$). However, after adjusting for age and gender factors, the study revealed that only those who are involved in administrative work do have a higher risk of LTBI compared to other job specification (adjusted OR=5.366; 95% CI=1.397-20.619) as shown in Table 3.

Table 2. Bivariate analysis on LTBI and respondent characteristics

Variable	LTBI		P value
	Yes	No	
Age group (year), n (%)			0.001**
20-29	96 (46.4)	111 (53.6)	
30-39	37 (48.1)	40 (51.9)	
40-49	37 (45.1)	45 (54.9)	
> 50	16 (45.7)	19 (54.3)	
Gender, n (%)			0.001**
Male	40 (47.1)	45 (52.9)	
Female	146 (46.2)	170 (53.3)	
Job description, n (%)			0.030*
Professional	16 (41.0)	23 (59.0)	
Allied Health	99 (45.0)	121 (55.0)	
Support staff	59 (47.2)	66 (52.8)	
Administration	12 (70.6)	5 (29.4)	
Workplace, n (%)			0.001**
Medical wards	35 (44.3)	44 (55.7)	
Surgical wards	29 (48.3)	31 (51.7)	
Clinic / Pharmacy	32 (48.5)	34 (51.5)	
Emergency / Operation Theater	63 (45.0)	77 (55.0)	
Intensive care units	8 (36.4)	14 (63.6)	
Admin office	19 (55.9)	15 (44.1)	

*p<0.05; **p<0.01

Table 3. Multivariate analysis on LTBI and respondent characteristics

Variable	β	Adj. Odds ratio (OR)	95% Confidence Interval
Age group	0.054	1.055	0.320-3.480
Gender	0.118	1.125	0.332-3.813
Job description	1.680	5.366	1.397-20.619

4. DISCUSSION

The study exposed that the prevalence of LTBI was about 46.4% among the HCWs in one of the main government general hospital. It was higher compared to Germany (10.0%) [11], but was comparable with the finding from Saudi Arabia (46.1%) [12]. And the rate was comparatively lower than other countries like South Africa (56.7%) [13], Taiwan (88.8%) [14], and China (56.7%) [15].

Another study discovery was about the high prevalence of LTBI among young HCWs. It was supported by various studies than finding young age as one of the important factors for TBI [16]-[19]. However, some studies also found more cases of LTBI among older HCWs which in favour of this study finding [20]-[21].

LTBI was found to be higher among male than female HCWs as found by other studies. However, some studies showed the opposite gender [22]-[24]. It also showed that the risk of infection was dissimilar across the job description [25]. And for this study, health administrators were at higher risk of getting LTBI. It might be due to inadequate of knowledge, attitude and practise about prevention of TB infection [26]-[27].

5. CONCLUSION

This is the only study that revealed a high occurrence of TBI among non-clinical HCWs, administrative staff. They also need to have good knowledge and know the best practise in preventing the disease. The TB prevention programme should also include them as one of the potential participants in future. And they should be also included as one of the high risk groups among the healthcare workers in any health setting. Those non-clinical healthcare workers are actually at high risk of tuberculosis infection and need to be included in any prevention and monitoring activities that related. They have a great potential as the source of nosocomial tuberculosis to other patients and staffs.

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