

Full Length Research Paper

Health care seeking among pulmonary tuberculosis suspects in Wuhan: A community-based study

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The aim of this study was to investigate the patterns of health care seeking behavior and to identify the influential factors of the same behavior among community level tuberculosis (TB) suspects in Wuhan city, and to provide an appropriate method and relevant references to increase the detection rate for TB. We followed a cluster proportional sampling procedure to select the four study communities (clusters), a total of 5878 people above 15 years old. Subjects with continuous sputum coughing for more than two weeks, or subjects, who were found to be hemoptysis and with blood sputum, six months prior to the survey were included as research subjects, whom would be participants of an interview with questionnaires and receive X-ray examination, three sputum smear and sputum culture check from May to July in 2010. Chi-square test and logistic regression were used to analyze the influencing factors of health care seeking behavior among TB suspects. A total of 270 cases of TB suspects were interviewed and 259 questionnaires were eligible. 79 cases (30.5%) did not seek any health care, 86 cases (33.2%) have sought medical assistance from primary health care centers or general hospitals, 89 cases (34.4%) self-medicated, while 5 cases (1.9%), consulted a private practitioner. A logistic regression analysis revealed that the presence of health insurance (odd ratio (OR)=3.405, 95% confidence interval (CI)=1.018 to 11.392) was relevant to the formal visitation of TB suspects; the difference was significant ($P<0.05$). With the severe or chronic respiratory symptom (OR=4.959, 95%CI=2.548 to 9.652), no stigmatization (OR=2.528, 95%CI=1.317 to 4.853) were relevant to the formal visitation of TB suspects; the difference was highly significant ($P<0.01$). The proportion of TB suspects who had actively sought health care was low. The health insurance, severe or chronic respiratory symptom and stigmatization were the main influential factors upon health care seeking behavior among community level TB suspects.

Key words: Tuberculosis, suspects, health care seeking behavior.

INTRODUCTION

At present, tuberculosis (TB) remains one of the greatest public health problems in the world. China ranked the second among the world's 22 TB high-burden countries, with the number of TB cases up to 1.5 million in 2010 according to World Health Organization 2011 Global Tuberculosis Control report (WHO, 2011). Detecting and curing TB patients are currently the two major applications for the prevention and control of TB. The cure rate for TB patients with new smear positive increased

quickly and reached up to 94% in 2010 with the coverage of Directly Observed Treatment Short-course (DOTS) in most China area. However, the detection rate of tuberculosis patients is not satisfactory, with only 10.5% according to the Fifth National Epidemiological Survey of Tuberculosis (National Technical Steering Group of the Epidemiological Sampling Survey for Tuberculosis, 2012).

The issues that led to the low detection rate could be

summarized as follows: the main way to detect TB patients is passive case finding and proportion of TB suspect to seek health care actively is not high. The fourth national TB epidemiological survey showed that among the detection ways of tuberculosis patients, visitation accounted for 94.3% and only 57.2% of symptomatic cases seek health care actively (National Technical Steering Group of the Epidemiological Sampling Survey for Tuberculosis, 2002). The fifth national TB epidemiological survey showed that the proportion of symptomatic cases to seek health care was only 46.8% (National Technical Steering Group of the Epidemiological Sampling Survey for Tuberculosis, 2012). The pattern of TB suspect to seek health care will influence the level of the patient detection. In order to improve the detection rate of TB and control the spread of TB, we must improve the pattern of health seeking behavior among TB suspects.

Studies have shown that the seeking behavior is influenced by seeking motivation, medical conditions, medical standards and reputation, social status, economic factors and health-care system and multifactors. In China, there are some studies (Fei et al., 2006; Hu et al., 2004; Long et al., 2007) about the factors to impact diagnosis delay of TB suspects. But the aforementioned studies were hospital-based, in which subjects with suspicious symptoms surveyed are actively seeking medical care, thus their conclusions could not represent all of the TB suspect in the community because of a large part of TB suspect among the community had not sought health care actively. There is only one community-based (Fei et al., 2006). This study was conducted in rural area Yangzhong, and therefore cannot represent the TB suspect in urban community.

From May to July, 2010, by the use of probability proportionate cluster sampling method, our study was conducted in Wuhan city, to understand the health seeking behavior of TB suspect in the community, and to provide the basis of further improving the detection rate of TB patients.

MATERIALS AND METHODS

Study subjects

This study was conducted from May 19, 2010 to July 10, 2010 in the Wuhan city, located in the center of China. The central city population is estimated to be 8,355,527 with a male/female ratio of 1.06:1.

We followed a probability proportionate cluster sampling procedure to select the study community (clusters). The sample size was calculated using the following formula to estimate the simple random sample size:

$$n = \frac{\mu_{\alpha}^2}{\delta^2} p \quad 1 - p$$

Assuming that TB suspect prevalence was above 15 year in Wuhan central city $p=2.5/100$, $\alpha=0.05$, thus $\mu_{\alpha}=1.96$, coefficient of variation (CV)=10%, thus permissible error $\delta = 1.96 \times p \times CV = 0.0049$, the minimum sample size(n) was calculated to be 3900 individuals. In

this study, taking into account the probability proportionate cluster sampling method to determine the survey sites the sample size was expanded to 7800. This was equivalent to 6 clusters with an estimated 1500 people above 15 years per community. We reduced the sampling size to be 4 clusters, because of the cost and resources were limited. The 4 clusters had a population of 5878 above 15 years of age. People who had been a TB suspect in the last 6 months and of age >15 years old were selected as our subjects.

Data collection

First of all, the investigating group consists of community hospitals and community committee staffs that verified the information and informed the location and timing of the inspection door to door. After verification, the verification results were entered in a timely manner to the software, and each subjects personal data was printed out for on-site examination. Survey settings were located in the community health center. Residents to attend the investigation were asked to first register and verify personal information, then receive symptom questionnaire, followed by going to the survey room. For TB suspects in the last 6 months, the investigators interviewed suspects using the "health care seeking behavior questionnaire". After that, they were requested to provide three sputum samples for bacteriological analysis, receive chest radiology, and finally receive 15 yuan transport subsidies.

In this study, the seeking behavior questionnaire included six parts: general, no action, treatment situation, self-medication situation, TB-related knowledge, attitudes and behavior. "General" section included sex, date of birth, residence, educational level, occupation, marital status, monthly family net income, health insurance, etc. "No action" section included the reason for taking no action and the next intention. "Treatment situation" section included the reason to see doctor, the initial symptoms, time of onset of symptoms, the treatment process (including treatment time, treatment, medical institutions, diagnosis, treatment and prognosis of the situation, etc). "Self-medication situation" section included the reasons for self-medication, drug type, source and treatment; "TB-related knowledge and attitude and behavior" section included TB-related knowledge, attitudes and behavior.

Definition of variables

TB suspect was defined as an individual with a history of cough for 2 weeks or more, chest pain, difficulty in breathing or hemoptysis in the last 6 months prior to the investigation time.

Formal visitation was defined as visiting to community and outside health services. Self-medication referred to TB suspect without a physician's prescription choice, the use of drugs to deal with the symptoms of self-awareness to and disease.

Statistical analysis

The collected questionnaire would be checked by two different investigators. Data entry and check were done by Epidata3.0 databases. Chi-square test and multivariate logistic regression was used to analyze the risk factors of TB suspect's health care seeking action. A two-tailed $P < 0.05$ was used as the criterion of statistical significance. All statistical analyses were performed by Statistical Package for Social Sciences (SPSS) v18.0 software.

RESULTS

Status of health care action

A total of 270 questionnaires, after questionnaires of

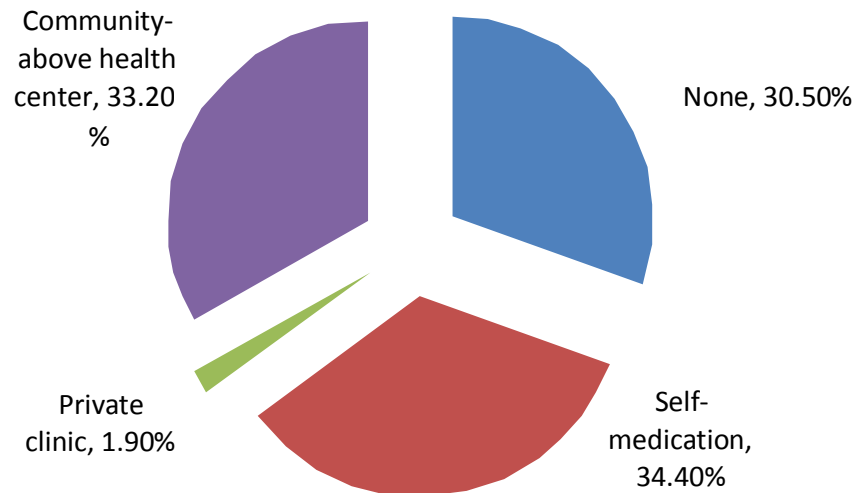


Figure 1. Action taking among TB suspects.

those not completed were cancelled, 259 questionnaires were eligible. The response rate was 95.9%. A total of 259 TB suspects (139 males and 120 females) were enrolled in this study, with mean age of 34.13 ± 13.56 years (ranging from 15 to 85 years); 88.8% of the respondents had various forms of health insurance (public health, medical insurance for urban workers, the new rural cooperative health insurance, etc).

Majority, 180 (69.5%) of the TB suspects took different forms of health care actions for their symptoms. 86 (33.2%) visited community-above health center. 5 (1.9%) visited private clinic. 89 (34.4%) had self medication and 79 (30.5%) did not seek any form of health care for their symptoms (Figure 1).

Of the total 86 (33.2%) TB suspects who sought health care from medical health providers, only 15 (17.4%) were reported having given a sputum sample for Acid-Fast Bacilli (AFB) during their visit. Among 86 (33.2%) TB suspects who visited community-above health center, only 8 (9.3%) were reported to have been referred to the next level of health care for further investigation and management.

The clinical features

The most commonly reported symptom for the 259 pulmonary TB suspect was cough or expectoration (97.7%), others included hemoptysis or bloody sputum (7.3%), fever (19.7%), weight loss (10.4%), chest pain (14.3%), night sweats (7.3%), dyspnea (12.0%), and other symptoms (such as chest tightness, etc) (1.9%).

After the TB suspect having the aforementioned symptoms, 136 cases (52.5%) consider themselves to have cold, 15 cases (5.8%) had pneumonia, 50 cases (19.3%) had bronchitis or bronchitis, 7 cases (2.7%) had tuberculosis, 7 cases (2.7%) had asthma, three cases (1.2%) had emphysema, 23 cases (8.9%) had other

reasons due to smoking, lit, etc.

Case detection

After the end of the field investigation, 7 in 259 cases were diagnosed with active pulmonary tuberculosis, 1 case with smear-positive pulmonary tuberculosis, and 1 case was a known patient who was in treatment. In 7 patients, duration of cough expectoration was 22 to 170 days. Among 7 patients, 2 cases did not take any form of health care finding, 2 cases took self-medication, and 3 cases went to medical units above the community level. In 7 patients, 1 case was referred by community medical institutions to TB control center, the rest were newly detected.

Reasons for seeking no health care

After the onset of symptoms, 79 cases (30.5%) did not have any form of health seeking behavior. The main reason for it (57 cases, 72.2%) was the self-inductance of less severity, thus there was no need for treatment or medication. Other reasons were economic difficulties in 7 cases (8.9%), being troubled (7 cases, 8.9%) and bad attitude of the doctor (1 case, 1.3%).

Reasons for self-medication

In 259 cases, 89 cases (34.4%) had self-medication. The main reason for choosing self-medication was self-inductance as mild disease and no need to see the doctor (37 cases, 41.6%). Other reasons were had experience (25 cases, 28.1%), suffered from a similar disease, according to doctors' previous prescription towards it to purchase medicaments (14 cases, 15.7%), economic difficulties (5 cases, 5.6%), had no time (6 cases, 6.7%), other (2 cases, 2.2%) such as feeling trouble, etc.

Table 1. Influential factors of formal visitation by univariable analysis.

Factor	Formal visitation			
	No	Yes	χ^2	P
Sex				
Male	84	36	1.035	0.309
Female	89	50		
Age (year)				
60~	58	32	0.549	0.760
40~	66	33		
15~	49	21		
Residence				
Migrant	20	12	0.304	0.582
Resident	153	74		
Education				
Junior middle school and lower	93	46	0.002	0.967
Senior middle school and above	80	40		
Occupation				
Unemployed/laid off	27	14	1.211	0.750
Employed	61	32		
Retired	63	33		
Student	22	7		
Marriage				
Divorced/widowed/separated	23	12	0.342	0.843
Married	121	62		
Unmarried	29	12		
Average per capita income (yuan)				
<1000	82	53	3.825	0.148
1000~	67	26		
>3000	17	6		
Health insurance				
With	24	5	3.752	0.053
Without	149	81		
Chronic or severe* respiratory symptoms				
No	139	41	28.927	0.000
Yes	34	45		
Score of TB-related knowledge				
<9	37	24	1.504	0.220
≥9	130	58		
Stigma				
No	95	59	5.290	0.021
yes	72	23		

Determinants of health care seeking behavior

Univariate analysis showed (Table 1) that the factors influencing the formal visitation were with chronic or

severe respiratory symptoms ($\chi^2 = 28.927$, $P = 0.000$) and no stigma ($\chi^2 = 5.290$, $P = 0.021$). Multivariate logistic analysis showed (Table 2) that the factors influencing the formal visitation were the presence of health insurance

Table 2. Influential factors of formal visitation by multivariable logistical regression analysis.

Factor	B	SE	Wald	P	OR	95%CI
Health insurance (yes=1, no=0)	1.225	0.616	3.955	0.047	3.405	1.018~11.392
Chronic or severe respiratory (yes=1, no=0)	1.601	0.340	22.210	0.000	4.959	2.548~9.652
Stigma (yes=0, no=1)	0.927	0.333	7.767	0.005	2.528	1.317~4.853

(odd ratio (OR)=3.405, 95% confidence interval (CI): 1.018 to 11.392), with chronic or severe respiratory symptoms (OR=4.959, 95% CI: 2.548 to 9.652) and no stigma (OR=2.528, 95% CI: 1.317 to 4.853).

DISCUSSION

This study found out that after the onset of symptoms among the TB suspects in communities, 30.5% had not taken any action, 33.2% visited community-above level healthcare center, 1.9% visited private clinic, and 34.4% used self medication. Tupasi et al. (2000) study on Philippines found out that 43.0% of TB suspects did not take any action, 31.6% took self-medication, and 25.4% went to various hospitals for treatment. In a study in rural India by Fochsen et al. (2006), 30.9% of the TB suspects did not take any action and 69.1% sought any form of medical care including self-medication.

After the onset of symptoms, 79 (30.5%) cases did not seek any form of health care. The main reason for it was that they considered that the symptoms were light and there was no need to have treatment or medication. The fourth national epidemiological survey of tuberculosis in 2000 and the fifth in 2010 showed that the first reason why TB suspects did not seek treatment was "they did not care", the ratio was 56.2 and 76.0%, respectively (National Technical Steering Group of the Epidemiological Sampling Survey for Tuberculosis, 2002, 2012). Rumman et al. (2008) also found out that the reason why 80.7% of TB suspects did not seek health care was because they thought that the symptoms were not severe. Thus, because cough, expectoration, and fever are very common in the population; most people will consider it as a cold and cold in most cases will not affect people severely. Therefore, we must make people aware of the seriousness of symptoms ("cough, sputum for two weeks") and raise the doubts of tuberculosis.

Our study found that when the suspects had chronic or severe respiratory symptoms such as hemoptysis or dyspnea, the possibility of TB suspects to seek health care was 4.959 (95% CI: 2.548 to 9.652) times as high as those without such symptoms. The results of this study were supported by the previous studies by Tupasi et al. (2000) study in Philippines, Nair et al. (1997) research in Mumbai, Ponticello et al. (2001) in Italy and Lambert et al. (2005). The results were consistent with the results of Lewis et al. (2003) in London. TB suspects who had chronic cough and (or) other lung diseases are less likely

to delay.

This study found out that health insurance is also an influential factor of TB suspects to seek health care. Those with health insurance were more likely to see doctor. Wang et al. (2008) also found out that TB suspects without health insurance often experience longer delay. Fei et al. (2006) study also found that health insurance affected the TB suspect's seeking health care behavior and patient delay. Uninsured people often had low income, and must pay for the treatment by themselves. Even if there is a case of cough and expectoration more than two weeks, people without health insurance usually delay treatment, even not to see doctor, or take way to relieve symptoms from self medication. Therefore, we should further expand health insurance coverage, and then prompt TB suspects to seek health care.

Our study also found out that stigma affected the presence or absence of TB suspects to take formal health care seeking action. The possibility to have a formal treatment of those without a sense of shame is 2.528 times as those with the sense of shame. A study by Yan et al. (2006) also showed a high frequent phenomenon in the common population that stigma or discrimination towards tuberculosis lead to fear and prejudice and to hinder the individual to seek professional health care, thus increasing the spread of TB in the population.

The present study has limitation. Our subjects were TB suspects in the last 6 months. Outcome variable of health care action taken was self-reported. Recall bias may exist. To minimize this bias, we asked about the onset of the major symptoms (cough) and how long did it take to take an action. In addition, we had used local calendar, listing the main festival and national days to confirm the date of symptom onset.

In addition, the sample size was calculated by simple random sampling size formula to be 3 clusters. Due to the use of probability proportionate cluster sampling method, the theory should expand the sample size to be 6 clusters. However, due to limited human, material and financial resources, in this study, only four clusters had been selected, which may lead to a certain degree of sampling error.

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