



A case study on tuberculosis prevention among household contacts in surin province, Thailand

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ABSTRACT

Tuberculosis (TB) still accounts for 8.4 million new cases and the related deaths are 1.9 million reported worldwide every year. Susceptible household contacts of pulmonary tuberculosis are vulnerable to be new cases in Thailand. A purpose of this study was to explain behavioural changes affected tuberculosis prevention in household contacts. The comparative study was conducted in 32 household contacts of new TB cases in Thatoom district, Surin province. It was found that after participating in a research programme from April to September 2010, study subjects had statistically significant improvements in preventive behaviours. Household contacts could increase knowledge of tuberculosis and realise carefully to being this disease. From active surveillance, there was no any household contact subject get infection of pulmonary tuberculosis which test by sputum examination. This appropriate programme will reduce the incidence rates of tuberculosis, and should be applied to other areas for tuberculosis surveillance and prevention.

INTRODUCTION

Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis*, which most commonly affects the lungs. It is transmitted from person to person via droplets from the throat and lungs of cases of active pulmonary TB. Persons living in the household of a tuberculosis patient therefore have a high risk of becoming infected and developing tuberculosis themselves, in particular if their immune defenses are at all impaired [1]. The World Health Organization states the six components of the stop TB strategy including 1) pursuing high-quality DOTS expansion and enhancement, 2) addressing TB/HIV, MDR-TB and the needs of poor and vulnerable populations, 3) contributing to health system strengthening based on primary health care, 4) engaging all care providers, 5) empowering people with TB and communities through partnerships, and 6) enabling and promoting research [2,3].

The incidence and prevalence of tuberculosis in Thailand are still increasing dramatically in a recent decade even though tuberculosis is treatable with a six-month course of antibiotics, because of the re-infection and re-activation of TB. Moreover, the person to person transmission of TB, especially in household and community of tuberculosis patients were highly case reported [4,5]. The household contact investigation to diagnose TB in earlier stage is an urgent need and should greatly prevent further spread of *M. tuberculosis* infection. Knowledge on the TB prevention would prevent household contacts from acquiring TB

and speed the community control of tuberculosis [6]. This study aimed to identify tuberculosis infection and to improve behavioural prevention for tuberculosis infection in household contacts of the new TB cases in Krapho Sub-district, Thatoom District, Surin Province, Thailand.

MATERIALS AND METHOD

This study was conducted between April and September 2010 in household contacts of freshly diagnosed of tuberculosis registered at TB clinic of Thatoom hospital, who living in Krapho Sub-district. The study samples of 32 household contacts were selected to participate in a research programme. Those participants had not got the tuberculosis infection during the study period. The study was approved by the Ethics Committee of Mahasarakham University, Thailand. All participants were asked to give verbal consent for study participation.

Data were collected using a questionnaire which was to evaluate perception and behavioural prevention of tuberculosis that conducting two points in time. The first measuring was immediately after the participants agreed to participate in the study. Then, the participants undertook a study programme for improving their health behaviours to prevent tuberculosis infection. The programme was conducted four times within 12 weeks that included learning knowledge of tuberculosis and preventive practice of tuberculosis. The second evaluation was conducted after completed the study programme. The structured questionnaire used was divided into three parts, characteristics of participants, tuberculosis perception, and tuberculosis

prevention. The perception scales range from 1 to 3 for each item. Compared mean analysis was performed using paired t-test which differences were considered significant at p-value 0.05.

RESULTS AND DISCUSSION

The frequencies of the characteristic variables are described by the number and the percentage. The total samples were 32 subjects who were mostly female and varied in age between 15 and 64 year old. The majority of participants educated a primary

Table No. 1 Characteristics of participants

Characteristics	Number	Percent
Sex		
Male	9	28.1
Female	23	71.9
Age		
15-24 yrs	4	12.5
25-34 yrs	3	9.4
35-44 yrs	11	34.4
45-54 yrs	5	15.6
55-64 yrs	9	28.1
Marital status		
Single	7	21.9
Couple	25	78.1
Education		
Primary school	24	75.0
Secondary school	8	25.0
Occupation		
Agriculture	22	68.8
Independent work	9	28.1
Employee	1	3.1
Household member		
1-3	9	28.1
4-6	20	62.5
7-9	3	9.4
Relationship		
Couple	7	21.9
Parent	8	25.0
Sibling	9	28.1
Relative	8	25.0

school level and had agricultural work.

Tuberculosis perception

It was found that after the study programme the severity and risk perceptions of tuberculosis increased significantly. Table No. 2 shows that the mean scores of post-test were higher than the scores of pre-test before participating in the programme. The participants increased their knowledge of tuberculosis from the study programme such as disease occurrence, treatment, and prognosis of tuberculosis. They perceived that everybody was susceptible to infect tuberculosis. For example, if young children get tuberculosis infection, they will get more severe conditions than the adult cases. The participants also had improved their perception about tuberculosis. They perceived the severities of tuberculosis; even though the disease is treatable by antibiotics. They realized that all ages of household members were vulnerable to get infection of tuberculosis. Good education of household contacts on tuberculosis could prevent tuberculosis infection for household members and would be also for a community [9].

Table No. 2 Comparison of tuberculosis perceptions between two points in time

Perception	Pre test		Post test		t	p
	\bar{x}	S.D.	\bar{x}	S.D.		
Severity	1.83	0.30	2.28	0.24	9.71	<0.001
Risk	1.92	0.27	2.25	0.21	8.97	<0.001

Note: Severity = Severity perception of tuberculosis
 Risk = Risk perception of tuberculosis
 \bar{x} = Mean scores of perception
 S.D. = Standard deviation
 t = t-distribution of independent t-test

Tuberculosis prevention

Table No. 3 displays the differences of mean scores of the behavioural prevention between the pre-test and post-test evaluations. There were significant differences in the mean scores of behavioural prevention, as being higher in post-test than in pre-test. As a result of the preventive practice, the participants could improve tuberculosis prevention for living with the patients. Environmental TB control was expected to prevent the spread of infection by patient isolation, decreasing the concentration of infectious droplet nuclei and maximizing natural ventilation. The personal hygiene of household members was developed such as hand washing, wearing a mask, and sputum secreting.

Table No. 3 Comparison of behavioural prevention between two points in time

Prevention	Pre test		Post test		t	p
	\bar{x}	S.D.	\bar{x}	S.D.		
Behavioural prevention	1.68	0.25	2.33	0.19	13.73	<0.001

There was no new case of tuberculosis infection among the household contacts during the study period, and also until May 2011 when the last follow up was made. It is clear that active case surveillance among household contacts yields substantially more TB cases than passive case surveillance because household members and close associates of tuberculosis patients comprise a high-risk group for tuberculosis [8]. These findings suggest that although priority healthcare should be given to infectious cases of tuberculosis, household contacts are no less important. Contact investigation for cases of active pulmonary TB need to be standard practice in Thailand. Through this study process, household and other close contacts of infectious case subjects were identified and tested for TB infection and disease [7].

Moreover, the study programme which included health education, group discussion and preventive practice could improve knowledge and practice of tuberculosis prevention. This impressed on not only the participants but also on the family and community as a whole. Additionally, the basic principle of control of tuberculosis is treatment of infectious cases in early stages, thereby preventing the spread of infection. It is estimated that approximately 10% of those infected develop active disease during their lifetime [6].

CONCLUSION

It is clear that household contacts living in the same house as the infectious case of tuberculosis are considered by definition to share breathing space on a daily basis with the source case. To prevent those individuals from getting the infection and also becoming the tuberculosis cases, the active surveillance and the effective prevention of the disease need to be concerned from the health workers. The results of this study show that household contacts could increase knowledge of tuberculosis and realise carefully to being this disease. They had dramatically improved their preventive skills to prevent and control tuberculosis transmission to the household members. Thus, tuberculosis prevention in household contacts should be considered in parallel with chemotherapy control in the infectious tuberculosis cases. Consequently, the number of new cases of tuberculosis will be reduced eventually.

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