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Analysis factors of direct contact by tuberculosis sufferers to higher incident risk factor in district of Sumberjambe Region of Jember, Indonesia

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Abstract

Context: Tuberculosis in a Basic Research of Health 2018 has shown the program to reduce the growing of TB in 2013 to 2018 has the same value (0.4 %). One of the TB transmission depend on the contagious level. On adult sufferer with positive acid resistant bacilli (BTA), more infectious than the negative one even still can transmit the disease. Tb sufferer with negative culture and rongent positive is 17 %. **Aims**: To know the factors of spreading in higher incidence of tuberculosis, which mean the duration of direct contact with the TB's sufferer; the density of home occupancy; the history of roommate; and the behavior of ejection sputum. **Settings and Design**: Cross sectional approach. **Methods and Material**: Used questionnaires to find out the data of direct contact factors of tuberculosis on 30 people who had been infected by tuberculosis. **Statistical analysis used**: Chi square. **Results**: Bivariate analysis from duration of direct contact with TB's sufferer performed the significant level or *P value* 0.464. The density of home occupancy showed *P value* 0.04. Based on the history of roommate, *P value* 0.06. Behavior ejection sputum was examined with *P value* 0.00. **Conclusions**: Factors that influenced higher incidence risk in tuberculosis direct contact are the behavior of ejection sputum and the density of home occupancy. Conversely, the history of roommate and the duration of direct contact with the TB's sufferer did not prove any relation about it.

Keywords: Tuberculosis, Spreading, Higher incidence

Introduction

Basic research of health 2018 has shown the authentic data about tuberculosis (TB) prevalence. In fact, as long as the program to reduce the growing of TB in 2013 to 2018 has the same value (0.4 %)[1][2][4]. One of the TB transmission depend on the contagious level. On adult sufferer with positive acid resistant bacilli (BTA), more infectious than the negative one even still can transmit the disease. In BTA positive, the contagious level is 65 %. In BTA negative but the culture positive is 26 %. Tb sufferer with negative culture and rongent positive is 17 %[5]. In the world, the spreading of TB from 304 childrens who had contact with adult sufferers showed 48% had positive TB [8][9]. World Health

Organization (WHO) also estimated there is 1,3 million new cases a year[10].

This study conducted to know the factors that affected the spreading in higher incidence of tuberculosis, which mean the duration of direct contact with the TB's sufferer; the density of home occupancy; the history of roommate; and the behavior of ejection sputum.

Materials and Methods

This study used cross sectional approach to observe the sample in district of Sumberjambe region of Jember and using chi square method to analyze the data of direct contact factors that affected higher incidence risk in tuberculosis sufferer.

The sample size was 30 people who had been infected by tuberculosis. Inclusion criteria: TB sufferer with BTA ± adult people cooperative people Exclusion criteria: people with severe ilness people with mental disease Independent variable: the direct contact with TB sufferer Dependent variable: contagious TB to the family The tools of this study used questionnaire. The questionnaire was arranged by: duration of direct contact with the TB's sufferer, the density of home occupancy, the history of roommate, and the behavior of sputum ejection.

Statistic analysis

Chi square

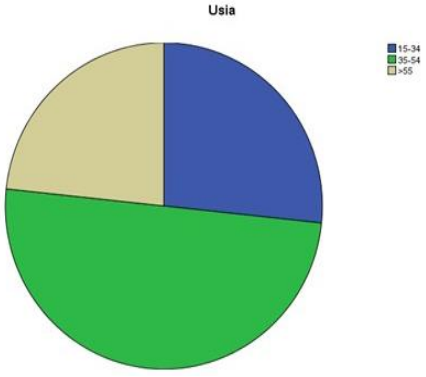
Result

Univariate analysis

Age

The most respondent is 35 y.o to 54 y.o (15 persons from 30). It means much respondent are productive age (Table 1).

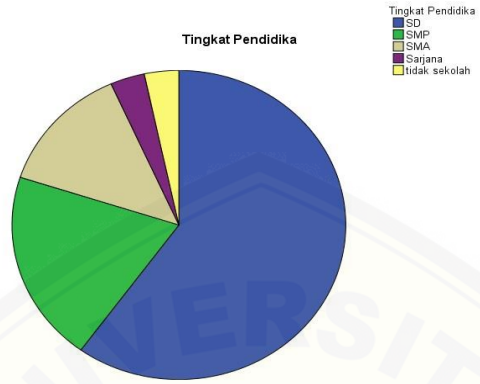
Table 1. Age of Respondent



Education

Eighteen respondents (60 %) showed in elementary school for their education. The second level is in junior high school (six people) (Table 2).

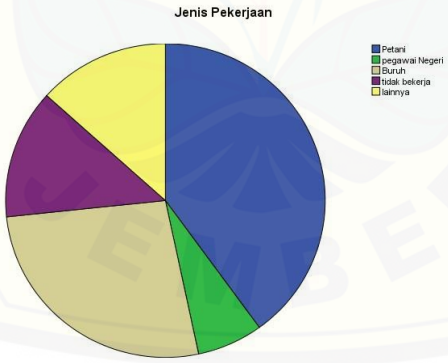
Table 2. Education of Respondent



Job

The table about job of respondent performed that most of respondent is a farmer (12 people or 40 %). Worker is in the second place (8 people or 26.7 %).

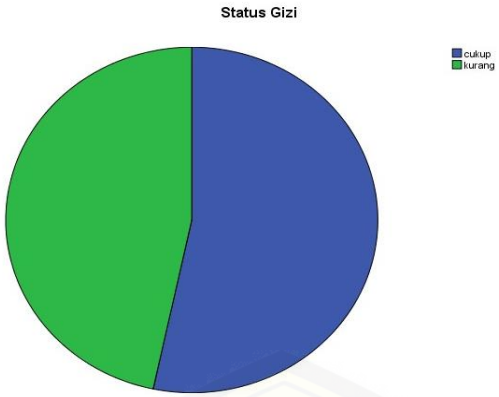
Table 3. Job of Respondent



Nutritional status

The nutritional status showed that many respondent have normal nutritional status (16 people or 53.3 %). Amous 40 people or 46.7 % have bad condition in nutritional status.

Table 4. Nutritional Status of Respondent



Bivariate analysis

Direct contact

Bivariate analysis from duration of direct contact with TB's sufferer performed *P* value 0.464.

Table 5. Direct Contact of TB

TB positive	Long of contact		Total	p	OR
	< 6 bulan	> 6 bulan	n	valu e	(95 % Confident Iinterval)
Yes	10	6	16	0.76	1.250
No	8	6	5		
Total	18	12	14 30		

Home density of occupancy

The density of home occupancy showed *P* value 0.04.

Table 6. History Density of Occupancy

TB	Density of occupancy		Total	P	OR
Positive	< 10 m^2 org^{-1}	> 10 m^2 org^{-1}	n	Value	(95 % Cl)
Yes	15	1	16	0.04	8.333
No	9	5	14		
Total	24	6	30		

History of Roommate

Based on the history of roommate, *P* value showed 0.06.

Table 7. Home Density of Occupancy

Positive TB	Roommate		Total n	*P* Value	OR (95 % CI)
	Yes	No			
Yes	10	6	16	0.06	0.128
No	13	1	14		
Total	23	7	30		

Based on the history of roommate, *P* value showed 0.06.

Behavior of sputum ejection

Behavior ejection sputum is the lattest factor was examined with *P* value 0.00. It enabled occurrence of dangerous tuberculosis spreading.

Table 8. Home Density of Occupancy

Positive TB	Sputum ejection		Total n	*P* Value	OR (95 % CI)
	Good	Bad			
Yes	1	15	16	0.00	0.110
No	12	2	14		
Total	13	17	30		

Discussion

Factors that influenced higher incidence risk in tuberculosis direct contact are the behavior of ejection sputum and the density of home occupancy. It could happen because the bad behavior of ejection sputum affected wider distribution of germs (*Mycobacterial tuberculosis* (Zopf, 1883)). Cough has long been implicated in the production of infectious aerosol leading to transmission of tuberculosis (TB). Elucidating the role of cough in transmission depends on understanding the physical process of aerosolizing and expelling mycobacterium tuberculosis (Mtb) bacilli. In the last decade, human aerosol studies have progressed with improved precision of particle detection and greater sophistication of experimental protocols. Additionally, recent success in the direct detection of naturally generated Mtb aerosols has allowed more detailed characterization in terms of their rate of production and size distribution. TB transmission depends on the

coincidence of the site of aerosol generation with the presence of Mtb bacilli. This review will examine the evidence for site of aerosol production during cough and respiratory activities in conjunction with the characteristics of detectable Mtb aerosols and locations of tuberculosis infection. Furthermore, we propose respiratory activities that are likely to optimise aerosol sampling for investigation of transmission(12). TB is an airborne disease that usually affects the lungs leading to severe coughing, fever, and chest pains. Although current research in the past four years has provided valuable insight into TB transmission, diagnosis, and treatment, much remains to be discovered to effectively decrease the incidence of and eventually eradicate TB. The disease still puts a strain on public health, being only second to HIV/AIDS in causing high mortality rates. This review will highlight the history of TB as well as provide an overview of the current literature on epidemiology, pathogenesis and the immune response, treatment, and control of TB. In this race to combat a disease that knows no boundaries, it is necessary to have a conceptual and clear understanding of TB overall with the hope of providing better treatment through novel and collaborative research and public health efforts(13). The density of home occupancy also contributed when the sufferer TB's living together with the healthy people in densely population, it could make easier in spreading the disease. The determinant of pulmonal tuberculosis divided in two main variables, there are environtment and population. Environtment consists of occupational density. Population consists of gender and age. The different data showed on the study which held in Wori, Indonesia[3], age and gender have strengthen correlation with tuberculosis than occupational density. A study on seven months of recruitment achieved sample size to test for a 33% primary effect on the primary outcome[13], showed that the socioeconomics intervention improved TB cures rates and Tb chemoprofilaxis uptake and completion in an impoverished setting. This evidence supports implementation of recent global policy changes. Socioeconomics support is part of the recently ratified post-2015 global end TB strategy.

Conversely,from this study the history of roommate and the duration of direct contact with the TB's sufferer did not prove any relation about it.

So, it is better for next research is adding quantity of respondent to make more reliable and valid of the result.

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