

Infection Control Risk Assessment Tuberculosis on Children based Area in the City of Banjarbaru

Ruslan Muhyi¹, Rosellina Parahiyangani^{2,3}, Lenie Marlinae⁴, Fauzie Rahman⁴, Dian Rosadi⁴, Nida Ulfah⁴

¹Departement of Pediatric, ²Magister Public Health Science Program Study, ³Departement of Biology,

⁴Public Health Program Study, Medical Faculty, Lambung Mangkurat University

ABSTRACT

The child TB rate is 8.8% out of 3,153 cases, the incidence of child TB in South Kalimantan is 241 cases / year. TB on child data in South Kalimantan Province from 2009-2011 found as many 28 cases with smear + age 0-14 years. In 2014 and 2015, the proportion of tuberculosis patients found in Banjarbaru City was 10.84% and 8.5% compared to all TB patients. To get the results of the work of TB disease control is high it is necessary integration from planning to preparation of financing priorities one of the control systems of infection control infection measured that is ICRA (Infection Control Risk Assessment). ICRA is an important tool in developing planning, development, monitoring, evaluation and efforts to make consideration of the various stages and levels of risk of TB infection. This research is a descriptive study with ecological approach, to describe the condition of TB children in Banjarbaru City, South Kalimantan Province. The populations of the research are children with TB who were recorded and reported to the person in charge of TB program of Banjarbaru City Health Office. The sample of this research is all child tuberculosis patients in Puskesmas in Banjarbaru City area from January to December 2015.

Keyword: TB on Children, ICRA

INTRODUCTION

Tuberculosis (TB) in the world continues to increase, especially countries grouped in 22 countries with high burden countries so that 1993 WHO proclaimed TB one of the global emergency and as a disease of emerging diseases. Indonesia ranks fourth after India (2.0 million-2.5 million), China (0.9 million-1.1 million), South Africa (0.40 million - 0.6 million) and Indonesia at 0.4 million-0.5 million cases, 155-222 cases/100,000 population/year¹.

The discovery of TB cases in Indonesia still has not received adequate attention. This is reflected in the surveillance system that has not been able to obtain data on actual child TB, as not all treated cases are recorded in the Health Office and the quality of the diagnosis is questionable. The child TB rate is 8.8% out of 3,153 cases, the incidence of child TB in South Kalimantan is 241 cases / year. TB on children data in South Kalimantan Province from 2009-2011 found as many 28 cases with smear + age 0-14 years. In 2014 and 2015, the proportion of TB patients found in Banjarbaru City was 10.84% and 8.5% compared to all TB patients².

Survey results in Kota Banjarmasin (neighboring Banjarbaru City), only 28.6% reported TB cases handled to TB program managers in the Health Office (Mahendradhata et al., 2012). Integrated efforts to overcome or break the chain of transmission of TB disease should consider the risk factors for TB disease. Risk factors closely related to TB incidence / incidence are population factors. To get the results of the work of TB disease control is high then the necessary integration from planning to preparing financing priorities (Achmadi, 2008). One of the control system of infection control that measured is ICRA (Infection Control Risk Assessment). ICRA is an important tool in developing planning, development, monitoring, evaluation and efforts to make consideration of the various stages and levels of risk of TB infection³.

MATERIALS AND METHOD

This research is a descriptive study with ecological approach, to describe child TB condition. The study population was children with TB. The sample of this research is all child tuberculosis patient in Puskesmas in

Banjarbaru City area from January to December 2015. The research variables are management of case characteristic of child tuberculosis disease (gender, age, BCG status, nutritional status), physical house environmental risk factors house temperature, air humidity, lighting, home floor type and occupancy density), prevention of TB child infection and management of antibiotic resistance in the treatment of child tuberculosis in Banjarbaru City.

FINDINGS

Table 1: Results of univariate analysis

Variabel	Case		Control			
	N	(%)	N	(%)	N	(%)
Gender						
Male	12	54,5	8	36,4	20	45,5
Female	10	45,5	14	63,6	24	54,5
Age						
Toddler (<5 year old)	3	13,6	6	27,3	9	20,5
Not a toddler (≥5 years old)	8	36,4	11	50,0	19	43,2
BCG Immunization Status						
Yes	11	50,0	5	22,7	16	36,4
No	16	72,7	1	4,5	17	38,6
Temperature						
Not Suitable	6	27,3	21	95,5	27	61,4
Suitable	22	100	20	90,9	42	95,5
Humidity						
Not Suitable	-		2	9,1	2	4,5
Suitable	21	95,5	21	95,5	42	95,5
Illumination						
Not Suitable	1	4,5	1	4,5	2	4,5
Suitable	20	90,9	19	86,4	39	88,6
Length of Ventilation						
Not Suitable	2	9,1	3	13,6	5	11,4
Suitable	5	22,7	7	31,8	12	27,3
Type of Floor						
Wood floor	17	77,3	15	68,2	32	72,7
Cement Floor	6	27,3	10	45,7	16	36,3
Ceramics Floor	4	18,2	1	4,3	5	11,4
Length of floor						
Not Suitable	12	54,5	11	50	23	52,3
Suitable	5	22,7	14	63,6	18	40,9
Density of House						
Not Suitable	17	77,3	8	36,4	26	59,1
Suitable	5	22,7	14	63,6	18	40,9

Based on Table 1 it is known that in the gender variables, those who suffer from TB disease in children are mostly male (54.5%) from 22 respondents who suffer from tuberculosis.

In this study it is known that variabel age, who

suffer from TB disease big age of as many as 11 respondents (50.0%) from 22 respondents who suffer from tuberculosis.

Based on the above table, it is known that the distribution frequency of tuberculosis patients has mostly

received BCG immunization, from 22 respondents who suffer from pulmonary tuberculosis, 16 respondents (72.7%) have received BGC immunization.

Based on temperature variables, it is known that pulmonary tuberculosis patients are more found in environment with inappropriate temperature that is 22 respondents (100%) of total tuberculosis suffer as much as 22 respondents.

Based on the humidity variables, it is known that most respondents who suffer from tuberculosis disease have environment that is not appropriate with health humidity, that is 21 respondents (95.5%) of total TB suffer as much 22 respondents.

Based on standard of illumination, TB patients are more commonly found in those who have a house with illumination that is not in accordance with health standard, that is 20 respondents (90.9%) of total tuberculosis suffer as much as 22 respondents.

Based on the wide variables of ventilation, it is known that from the findings in the field, most of those who suffer from tuberculosis disease have the width of home ventilation according to health standard, that is 17 respondents (77.3%). Nevertheless, in this study found as many as 5 respondents (22.7%) who have a house ventilation area is not in accordance with health standards.

Based on the results of this study, it is known that from the variables of the floor type of the house, most of those who suffer from pulmonary tuberculosis have a ceramic floored house, that is 12 respondents (54.5%), however, in the findings of the field also found many tuberculosis patients with type of floor of board house, that is 6 (27,3%).

Based on the variable floor of the house, it is known that most tuberculosis patients have floor area not in accordance with health standards, as many as 5 respondents (22.7%). Based on the variable of house density, it is known that from 22 respondents who suffer from tuberculosis disease, as many as 17 respondents (77.3%) have appropriate occupancy density, and as many as 5 respondents (22.7%) others have unhygienic occupancy density.

Efforts to Prevent the Spread of tuberculosis Infection in Children with tuberculosis Children (Cases)

Overall, efforts to prevent the spread of child tuberculosis infections in child tuberculosis patients are mostly enough as much as 90.9 percent.

Table 2: Efforts to Prevent the Spread of tuberculosis Infection in Children with TB Children (Cases)

Variable	Case	
	N	(%)
Good	2	9.1
Enough	20	90.9
Total	22	100

Management of Antibiotic Resistance in Child Tuberculosis Treatment

Table 2: Antibiotic Resistance Management Efforts on the Treatment of Child Tuberculosis Patients

Variable	Case	
	N	(%)
Good	17	77.27
Enough	2	9.09
Less	3	13.63
Total	22	100

Overall, efforts to manage antibiotic resistance to tuberculosis treatment are mostly good as much as 77.27 percent.

DISCUSSION

Based on Table 1 it is known that in the gender variables, those who suffer from TB disease in children are mostly male.

According to the Islamiyati study tend to be more in girls, the ratio is 1: 4 (male: female) because in boys the portion is larger so it tends to have better nutritional status which enables better defense against illness. 17, 19.22

In this study it is known that age variable, who suffer from tuberculosis disease big age of as many ≥5 years old⁵.

Based on the above table, it is known that the distribution frequency of tuberculosis patients has mostly

received BCG immunization, from 22 respondents who suffer from pulmonary tuberculosis, 50.0 percent have received BGC immunization.

The result of statistical test shows that BCG immunization status (sig.0,001) gives a real effect to the incidence of pulmonary tuberculosis in children.

Immunization is a deliberate attempt to provide immunity (immunity) in infants or children to avoid disease. Immunization is also a very effective primary prevention effort to avoid infectious diseases. Thus, the incidence of infectious diseases will decrease, disability and death will be reduced.¹² BCG immunization is part of the immunization factors analyzed to predict the incidence of pulmonary TB in children. BCG immunization protects children from TB meningitis and miliary TB with a protective degree of approximately 86%⁶.

The environmental conditions of house includes temperature, humidity, illumination, wide house ventilation, floor area of the house and density of occupants. From this study it is known that tuberculosis patients are more commonly found in those who have homes with illumination that are inconsistent with healthy home standards of 90.9 percent.

The condition of home ventilation in respondents suffering from tuberculosis disease has wide ventilation according to health standard of 77.3 percent. However, the temperature and humidity conditions inside the house are largely unqualified. The floor area of the house and the density of the occupants are eligible at 77.3 percent

According to Gould and Brooker (2003), *Mycobacterium tuberculosis* bacteria has the preferred temperature range, but in this temperature range there is an optimum temperature that allows them to grow rapidly. *Mycobacterium tuberculosis* is a mesophilic bacteria that thrives in the range 25 - 40° C, but will grow optimally at 31-37°C⁷.

If the condition of air humidity in the room > 70% it will facilitate the breeding of microorganisms one of which is *mycobakterium tuberculosis*⁷.

The condition of the room is related to the incidence of pulmonary tuberculosis where people with unqualified room conditions have a chance of 1.18 times for contracting pulmonary TB compared to

a house with a qualified room condition. Condition of the room is eligible if ventilation is available > 10% floor area, windows are opened every day, lighting is good enough in the bedroom, kitchen or living room. Houses with good lighting and ventilation will complicate the growth of germs, because ultraviolet light can kill germs and good ventilation causes air exchange, thus reducing the concentration of germs. Unhealthy sources of illness have a 1.8 times greater risk of TB than those using healthy light^{7,8}.

Based on the wide variables of ventilation, it is known that from the findings in the field, most of those who suffer from TB disease have the width of home ventilation according to health standard.

Ahmad Dahlan (2001) study showed that houses with ventilation of <10% of the floor area had a chance of having TB 4.56 times compared with those with ventilation > 10% of floor area. According to Azwar (1995) ventilation serves to free the air from tuberculosis bacteria. Wide ventilation that does not meet the health requirements will result in blocking the process of air exchange and sunlight into the home as a result of tuberculosis germs that are in the house can not come out and participate inhaled with air respiration^{9,10}.

Based on the results of this study, it is known that from the variables of floor type of house, most of them who suffer from pulmonary tuberculosis have ceramic floored house, that is 12 respondents (54,5%), however, with type of floor of board house, that is 6 (27,3%).

According to research by Ariza Adnani and Asih Mahastuti (2003-2006) in Iskandar (2010) in Southeast Aceh District, the floor of the house is a risk factor for pulmonary tuberculosis disease, the risk to suffer from pulmonary tuberculosis is 3-4 times higher in people living at home whose floors do not meet health requirements.¹⁰ Based on the variable floor of the house, it is known that most tuberculosis patients have floor area not in accordance with health standards, as many as 12 respondents (54.5%).

The result of statistic test showed that the floor area of house and house density (sig 0,37) gave a real effect to the incidence of pulmonary tuberculosis in children.

The density of the dwelling is related to the breadth of the house floor which must be adjusted to the number of occupants so as not to cause overload. this is done

to minimize the contact of transmission of pulmonary tuberculosis disease to family members. Because the more dense the number of occupants the faster the transmission occurs¹¹.

According to Ginanjar (2008), the floor area of a healthy house building should be enough for the occupants in it. That is, the floor area of the building must be adjusted with the number of occupants. Building area that is not proportional to the number of occupants will cause the overcrowded.

CONCLUSION

1. Tuberculosis disease in children are mostly male.

2. More TB disease in under five years old

3. Tuberculosis disease occurs more often at home conditions that are not in accordance with health standards

Ethical Clearance: This study approved and received ethical clearance from the Committee of Public Health Research Ethics of Medical Faculty, Lambung Mangkurat University, Indonesia. In this study we followed the guidelines from the Committee of Public Health Committee of Public Health Research Ethics of Medical Faculty, Lambung Mangkurat University, Indonesia for ethical clearance and informed consent. The informed consent included the research title, purpose, participants's right, confidentiality and signature.

Source Funding: This study done by self funding from the authors.

Conflict of Interest: The authors declare that they have no conflict interest.

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