

The Correlation between Knowledge and Contact History with Incidence of Leprosy in Bireuen District, Aceh, Indonesia

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Abstract: Leprosy is a chronic infectious diseases which has become a public health problem in Indonesia, including at Bireuen District, Aceh Province. This study used observational analytic with a case control approach in Bireuen District, Aceh Province. This study aims to analyze the correlation between knowledge about leprosy, and contact history with leprosy patient with incidence of leprosy. The ratio of case and control was 1:1, with a total sample of 90 consisting of 45 cases and 45 controls. This study used total sampling in case group and purposive sampling in control group. The data were analyzed with Mann-Whitney, Chi-square, and logistic regression test. The logistic regression test results showed that the major contribution of the transmission of leprosy were knowledge about leprosy ($p=0,004$; OR=9,699; 95% CI 2,072-45,404), and contact history with leprosy patient ($p=0,006$; OR=36,974; 95% CI 2,844-480,606). In conclusion, there was a correlation between knowledge and contact history with leprosy patient towards leprosy in Bireuen District, Aceh Province.

1 INTRODUCTION

Leprosy is a chronic disease caused by *Mycobacterium leprae* that attacks the skin, peripheral nerves, upper respiratory mucosa, and eyes. *M. leprae* develops slowly with the incubation is about 5 years. Symptoms can occur within 1 year and even up to 20 years after incubation (WHO, 2017).

According to official reports received from 138 countries from WHO (World Health Organization) region was 176,176 cases (0.2 cases per 10,000 people) by the end of 2015 and globally reported 211,973 (2.9 new cases per 100,000 people) (WHO,2017). In 2011, among the 17 countries that had contribute leprosy patients in the world, Indonesia as the third country with the highest prevalence of leprosy patient after India and Brazil (Ditjen PPM & PL P2 kusta,2012). In 2015 there were 17,202 new case of leprosy reported in Indonesia with 84.5% of Multi Basiler (MB) (Health Ministry of The Republic of Indonesia, 2016).

Based on Indonesia Health Profile 2013, Aceh Province is one of the provinces that has a high prevalence of leprosy patients. Aceh was ranked the

9th highest number of leprosy patients in Indonesia (Health Ministry of The Republic of Indonesia, 2015). Result of Situation Analysis of Leprosy Eradication Program of Aceh Provincial Health Office in 2016 shows three districts with highest prevalence of leprosy in Aceh, which are North Aceh, Pidie, and Bireuen as the third rank (Health Office of Aceh Province, 2016).

The number of leprosy patients in Bireuen District fluctuates every year. In January 2013 until the end of March 2017 there were 170 cases of leprosy spread in 16 health centers in Bireuen District. Three working areas of health center in Bireuen District with the highest prevalence of leprosy from January 2013 to March 2017 are Peusangan Health Center, Jeumpa Health Center, and Kota Juang Health Center (Health Office of Bireuen District, 2017).

There are many factors that cause leprosy, such as age, sex, immunity factor, personal hygiene, knowledge, economic status, contact history with leprosy patients, occupancy density, and nutritional status. Contact history is one factor of leprosy. A person who had a contact history with a leprosy patient has twice risk of suffering from leprosy than someone who did not have a contact history with a

leprosy patient (Muharry A, 2013). This happened because of the high intensity of someone who had direct contact with leprosy patients, making transmission of leprosy easier.

The level of knowledge also has an important correlation of the transmission of leprosy. A person with low knowledge has 2.464 times greater risk towards leprosy than a person with good knowledge (Muharry A, 2013).

Research on factor analysis affecting leprosy in Aceh, especially in Bireuen District has not been studied previously. The highest number of leprosy patients in the working area such as Peusangan, Jeumpa and Kota Juang Community Health Center of Bireuen District, made the researcher interested to analyze the factors affecting leprosy in there. Factors of knowledge about leprosy and contact history with leprosy patient have a major contribution to the transmission of leprosy, so the researchers chose these factors to be studied the effect on leprosy.

2 RESEARCH METHODOLOGY

This research used analytic observational methodology with case control approach. The research data were collected in Peusangan, Jeumpa and Kota Juang Community Health Center of Bireuen District from November to December 2017. The samples in this study were patients who were treated and lived in the Peusangan, Jeumpa and Kota Juang Community Health Center Bireuen District which were grouped into cases and controls. The number of samples obtained is 45, with a ratio of 1: 1 then the total number of case and control samples is 90. In this study, the matching is age and sex. The primary data consists of data were obtained through questionnaire guided interview. Statistical analysis for nominal scale using Chi-square, while ordinal scale using Mann-Whitney, and multivariate analysis using logistic regression.

3 RESULTS AND DISCUSSION OF RESEARCH

Most leprosy cases were low knowledge as many as 25 respondents (100%). Unlike the control case, most of them had good knowledge as many as 30 respondents (90.9%). Mann-Whitney test results showed that there was a correlation between the level of knowledge with incidence of leprosy ($p = 0.000$).

The correlation between knowledge with incidence of leprosy can be seen in Table 1.

Table 1: Correlation of Knowledge about leprosy with Incidence of Leprosy.

Knowledge	Leprosy			P Value
	Leprosy	Non-Leprosy	Total	
	n (%)	n (%)	n (%)	
Low	25 (100)	0	25 (100)	0,000
Moderate	17 (53,1)	15 (46,9)	32 (100)	$P < 0,05$
Good	3 (9,1)	30 (90,9)	33 (100)	

The results of this study showed that the respondents in leprosy case had a contact history with leprosy patients as many as 25 respondents (96.2%), while the respondents in control case that had no contact history with leprosy patients as many as 44 respondents (68.8%).

Chi-square test results showed that there was a significant correlation between the contact history with leprosy ($p = 0.000$). The odd ratio (OR) was 55,000, explained that respondents who had a contact history with leprosy patients are 55 times more risk to develop leprosy than those who did not have a contact history with leprosy patients. The value of $OR > 1$ which means the contact history with leprosy patient is a risk factor for leprosy (Table 2).

Table 2: Correlation of Contact history with leprosy patient with incidence of Leprosy.

Contact History	Leprosy		P Value	OR	CI
	Leprosy	Non-Leprosy			
	n (%)	n (%)			
None	20 (31,3)	44 (68,8)	0,000	55,000	6,958 - 434,771
Yes	25 (96,2)	1 (3,8)	$P < 0,05$		
Total	45 (50)	45 (50)			

The factors were done multivariate analyzed by logistic regression test. The results of the analysis of these factors can be seen in Table 3.

Table 3: Test Results of Logistic Regression Analysis.

Variable	Sig.	Exp (B)	95% CI	
			Lower	Upper
Knowledge	0,004	9,699	2,072	45,404
Contact History	0,006	36,974	2,844	480,606

Based on the final results of logistic regression test showed that knowledge and contact history with leprosy patient had a major contribution to the transmission of leprosy.

3.1 Correlation between Knowledge with Incidence of Leprosy

The result of logistic regression test showed that knowledge level was leprosy risk factor ($p = 0,004$) with $OR = 9,699$. A person with low knowledge about leprosy has higher risk towards leprosy 10 times than someone with good knowledge about leprosy. The low knowledge about leprosy causes the ignorance of the transmission of leprosy, which affects the isolation or alienation of leprosy patients due to stigma. The respondents with low knowledge also causes ignorance of the possible consequences of leprosy if not treated adequately.

Based on field research, 62.2% of respondents do not know that leprosy is caused by leprosy bacteria, and 53.3% of respondents believe that leprosy is caused by God's curse. The results of this study also found that 85.6% of respondents argue that leprosy is transmitted through food cooked by leprosy patients, and as many as 66.7% of respondents stated that leprosy is a hereditary disease. Most respondents did not know that leprosy could be cured with complete and regular medication, and 54.4% of respondents did not know that treatment could break the chain of leprosy transmission. Low knowledge about leprosy can lead to late detection and treatment that can reduce efforts to prevent transmission of leprosy to people around.

The results of this study are consistent with the previous research which obtained the result that there was a significant correlation between knowledge and leprosy incidence. The level of knowledge has a significant correlation with leprosy because the higher knowledge of a person about leprosy, the better the person's actions in preventing leprosy (Ramadhani DS, 2013)

The results of this study are also reinforced by previous studies which indicate that there was a correlation of knowledge with leprosy (Curnelia IA, 2016). The higher knowledge and ability to think someone will encourage the individual to make a healthy lifestyle including disease prevention and health care behavior (Notoatmodjo, 2003).

Education is an initial capital for the community to gain knowledge and information. Education has an important role to the level of knowledge. The data obtained in this study states that most of the respondents with primary and junior secondary education have low knowledge. The higher a person's level of knowledge, the easier it will be for the person to receive and understand the information (Martomijoyo, 2014).

3.2 Correlation between Contact History with Leprosy Patient with Incidence of Leprosy

The result of logistic regression test showed that the contact history with leprosy patient was leprosy risk factor ($p = 0,006$) with $OR = 36,974$. A person who had a contact history with a leprosy patient has higher risk towards leprosy up to 37 times than someone who did not have a contact history with leprosy patient.

The results of this study are in accordance with existing theory that the transmission of *M. Leprae* is alive and intact out of the body of the patient and into the body of another person due to the tendency of frequent and long contact (Ditjen PPM & PL P2 kusta,2012). Contact history has an important role as a medium of transmission of leprosy. The existence of family members or relatives who suffer from leprosy, causes frequent intense closeness in the use of goods that transmit *M. leprae* to healthy people. The frequency of prolonged exposure increases the high risk of contracting leprosy compared with people who are rarely in contact with leprosy patient (Susanti and Azam, 2016).

The result of the research in the field is known that the case respondents before suffering from leprosy have a contact history with leprosy patient for more than 2 years, either with housemate or non housemate like friends and neighbors. Respondents who do not suffer from leprosy tend to have no contact history with leprosy patients.

The results of this study are in accordance with previous studies showing that there was a significant correlation between contact history with leprosy patient towards leprosy (Ramadhani DS, 2013). Other literature also states that contact history was a

risk factor for leprosy (Gustam TYP, 2017). A contact history with a leprosy patient makes it possible for transmission of *M. leprae* from an infected person to a healthy person (Susanti Kurnia Ningrum, 2016). The closer and longer a person contacts with leprosy patients, the greater likelihood of someone suffering from leprosy.

4 CONCLUSION

The conclusion based on the results of research is: There was a correlation between the level of knowledge and contact history with leprosy patient towards leprosy in Bireuen District, Aceh Province.

5 SUGGESTION

The suggestions of this research are:

1. Health Institutions such as Health Office are expected to establish good cooperation between health institutions in both Bireuen District and Aceh Province in improving the eradication of leprosy. One of the activities that can be carried out public education in general about leprosy.
2. The community is advised to actively follow the counseling held by the health agency, especially counseling about leprosy. People are also called upon to improve personal hygiene to reduce the risk of leprosy transmission.
3. Clinicians can provide adequate education to leprosy patients and families about leprosy to prevent transmission of widespread disease of leprosy.
4. Researchers then expected to add other variables that affect leprosy such as nutritional status, history of BCG vaccination and occupancy density.

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