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Water Reservoirs and Behavior to Dengue Fever in Rural Populations in Panongan, Tangerang 2016

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Abstract

Dengue Hemorrhagic Fever (DHF) is one of the main concerns in public health problems within Indonesia and often causes an outbreak of extraordinary events. Conditions of water reservoirs at home is a risk factor that can increase the incidence of dengue fever. This condition is also worsened by a minimal understanding with regards to dengue, seen from a poor environmental conditions so it facilitate the growth of mosquitoes. This study aims to analyze the corelation of water reservoir and behavior factor in Panongan Subdistrict, Tangerang on 2016. This study is a case control study. The sample of this study consisted of individuals diagnosed with DHF in the case group and individuals without DHF in the control group as recorded in the Primary Health Center Panongan in 2016. The research was conducted in June 2016. The study was conducted by interviewing the patients in both groups and observing the living environment. The analysis used was chi square. The analysis showed the relationship of water reservoirs and behavior is not significant. Eradication of dengue can be done with community empowerment that leads to positive behavior among others to make the effort of draining, closing, and burrying the water reservoir.

Keywords: Dengue hemorrhagic fever, water reservoir, behavior factor

1. INTRODUCTION

Dengue Hemorrhagic Fever (DHF) is a disease caused by dengue virus belong to Arthropod-Borne Virus, genus Flavivirus and family Flaviviridae. Dengue is transmitted by Aedes aegypti and Aedes albopictus. DHF can occur throughout the year and can affect all age groups. The disease is significantly to the people's behavior and enviromental sanitation (Ministry of Health, 2014).

DHF is endemic in 100 countries all over the world [13]. In Southeast Asia, there are 100 million cases of dengue fever and 500,000 of these cases needed treatment

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in hospitals, 90% of the infected population are children less than 15 years old. The number of deaths caused by DHF is estimated to be 25,000 every year [15]. DHF spread rapidly in most of the Southeast Asian countries located in the equatorial zones including Indonesia, Myanmar, Sri Lanka, Thailand, Timor-Leste. Aedes aegypti is widespread in urban and rural with a different virus serotypes [14].

The Ministry of Health (2016) stated that in January-February 2016 the number of patients infected with dengue fever in Indonesia was 13,219, 137 of the 13,219 infected patients died. The highest proportion of patients who affected DHF in Indonesia are children aged 5-14 years (42.72%), followed by people aged 15-44 years old (34.49%). Recently, dengue fever is widespread in some areas. Not only did the number of cases increased but also it was found that the disease has spread to a new areas leading to the occurance of outbreaks. Data from the Ministry of Health (2016) stated that the outbreaks in 2016 were reported in 9 districts and 2 cities from 11 provinces in Indonesia, including Tangerang.

Tangerang is located in the eastern side of Banten. It has 29 sub-districts, 28 government district, and 246 rural villages. Some of the sub-districts are rural villages including Panongan. Panongan is divided into 1 government district and 7 rural villages, namely Ranca Iyuh, Mekar Jaya, Ranca Kalapa, Panongan, Serdang Kulon, Ciakar, Mekar Bakti, and Peusar (Central Bureau of Statistics Tangerang, 2015). In 2015 there were 372 cases of dengue in Tangerang. In January to April 2016, there was a surge of cases of dengue fever in Tangerang with 1041 cases of which 20 people died. The highest case is in Panongan with 158 cases of patients with DHF. Cikupa had 122 cases and 2 deaths, 76 cases were recorded in Balaraja and two people died. Kresek had 60 cases with 2 deaths [4].

At first DHF, is a problem in urban areas but now it also threatens the suburbs (Department of Health, 2003). Dengue has spread from big cities, where urban areas act as reservoirs of the virus to areas with the scope of the smaller communities. This is shows that mobility contributes the spread of dengue virus [7].

Environment is a factor that play a major role in the spread of cases DHF. Behavior is the second factor that affect the health of individuals, groups, or communities. Although the community already has high awareness and knowledge about health, but the practice of public health behavior is still poor [10]. This condition is also worsened by a low lefel of understanding about dengue as seen in poor environmental conditions that facilitates the growth of mosquitoes [3]. In health issues, behavioral factors always play an important role. Behavioral factors and environmental factors are equally important in prevention disease. Kusumawardhani (2012) stated that in

rural villages in Bogor and Lebak, the proportion of respondents diagnosed with DHF have poor behavior (83,3%).

Condition of water reservoirs in homes is also a risk factor that can increase the incidence dengue fever. Aedes breeds well in places around neighbourhoods, such as a bathtub, drums, jars, water reservoirs, cans, pots or vases of flowers, place to eat/drink the pets, and other places which holds stagnant water and not contact with soil [12]. Usually, the society in rural villages have a habit of storing the water in water reservoirs. This is because in rural villages, water piping does not flow smoothly and blockages usually occurs (Nalongsackm Yoshida, Morita, Sosouphanh, & Sakamoto, 2009).

2. METHODS

This study is an observational study which researcher do the observations directly to respondent by distributing questionnaires to analyzed. The design is a case-control, comparing individuals who diagnosed with DHF in the case group and individuals without DHF in the control group. Then the researcher calculated the proportion of cases that are at risk and not at risk, and the proportion of control that are at risk and not at risk. The independent variables in this study included the availability of water reservoir, condition of water reservoir cover, knowledge, attitude and practices and the dependent variable was the incidence of dengue in Panongan, Tangerang.

The study was conducted in June 2016 in 8 villages in community health services of Panongan, Tangerang, there are Ciakar, Panongan, Ranca Kalapa, Serdang Kulon, Ranca Iyuh, Peusar, Mekar Bakti, and Mekar Jaya. The study begins with a preliminary survey, data collection, processing and reporting of research. The population in this study is the community who live in the area of community health services Panongan, Tangerang. The sample in this study (1) the sample of cases are individuals who diagnosed with DHF in community health services of Panongan, Tangerang which was reported from the hospitals and recorded in community health services of Panongan on January 2016-May 2016 (2) the sample of control are individual without DHF and the nearest neighbor with the case group and live in community health services of Panongan area. Based on the results of sample calculations and based on previous research, the minimum sample size of 87, with a comparison of cases and controls 1:1. The addition of the samples are 10% (95 samples). So the minimum of total sample are 190 samples with minimum sample of cases are 95 and minimum sample of control are 95

The sampling technique using simple random sampling so the population has the opportunity to elect to be sampled. The step oft sampling in this study were (a) ask for a list of the names and addresses of individuals who positively dengue (case) from community health service of Panongan on 2016 (b) the name of individual with positive dengue used as the sampling frame (sampling frame) to the case (c) from the each of frame sampling, conducted simple random sampling in order to get the number of samples in accordance with the calculation at least 95 for cases and controls (d) each respondent in the sample used as subjects and conducted interviews and observations based instrument that has been compiled.

Data that collected are (1) secondary data, obtained by observation and interviews directly to the staff of community health service in Panongan (2) primary data, obtained by interviews and observations to the respondent to determine risk factors for of dengue in Panongan using questionnaires and observation sheets.

Processing data using a data software includes editing, coding, processing, and cleaning data. Univariate analysis, to get information about the frequency distribution from each variables. Bivariate analysis, to see a significant relation between two variables: independent variable to dependent variable. Before the research, all the respondents are given information about the plans and objectives of the research through formal meetings and written. Each respondent was given the full right to approve or disapprove as a respondents by signed informed consent. Respondents were also given the information about the benefits and risks from this research and respondents were given the right to autonomy to obtain information to make a choices without coercion. Researcher do not show the identity of the respondent to maintain the confidentiality of the data. The data obtained is stored as an archive and can only be accessed by researcher. Researcher can provide data when needed for the improvement of health in accordance with the principles of openness and fairness. Researchers also observe the principles of honesty and maximize outcomes for the benefit and minimize the things that can be detrimental.

3. RESULTS

The result of the analysis shows that there is no significant relationship between the availability of water reservoir and the incidence DHF in Panongan. Although not significant, in the data showed the percentage of respondents who have a water reservoir of 77.4% and the proportion in the case group that have a water reservoir of 80%. In addition, the results of the analysis also found that respondents who have

water reservoir outside the home are at risk of 1.35 times higher to be affected by DHF than respondents who do not have water reservoir outside the home (Table 1).

The result showed that respondents who have water reservoir with open condition 47,4% and proportion in case group having water reservoir with open condition equal to 46,3%. Analysis of the relationship of water reservoir cover conditions with DHF in Panongan showed there is no significant relationship. (Table 1).

TABLE 1: Relationship of water reservoir with incidence of DHF in Panongan.

Variable	Group				(n=190)		p value	OR (95% CI)
	Cases (n=95)		Control (n=95)					
	n	%	n	%	n	%		
Water reservoir								
Yes	76	80	71	74.7	147	77.4	0.488	1.35 (0.68-2.67)
No	19	20	24	25.3	43	22.6		
Conditions of cover water reservoir								
Open	44	46.3	46	48.4	90	47.4	0.884	0.91 (0.52-1.62)
Close	51	53.7	49	51.6	100	52.6		

The result showed that respondents with low knowledge level were 33.2% and the proportion in case group with low knowledge level was 34.7%. Analysis of the relationship between the knowledge level and the incidence of DHF in Panongan showed no significant relationship. The results also showed that respondents with low knowledge were at risk 1.15 times higher to be affected by DHF than respondents with high knowledge level (Table 2).

The result of the research also showed that respondents who have bad attitude is 26,8% and the proportion in case group which have bad attitude is 24,2%. Analysis of the relationship between the respondents' attitude and the incidence of DHF in Kecamatan Panongan showed no significant relationship (Table 2).

The results obtained that respondents who have bad practices amounted to 38.9% and the proportion in case groups that have bad practices amounted to 41.1%. Analysis of the relationship between the respondents' practices and the incidence of DHF in Kecamatan Panongan showed no significant relationship. The results also showed that respondents who had bad practices were 1.19 times more likely to be affected by DHF than respondents who had good behavior (Table 2).

4. DISCUSSION

Table 2: Relationship of Behavior Factor with incidence of DHF in Panongan.

Variable	Group				n=190		p value	OR (95% CI)
	Cases (n=95)		Control (n=95)					
	n	%	n	%	n	%		
Knowledge								
Low	33	34.7	30	31.6	63	33.2	0.758	1.15 (0.63-2.11)
High	62	65.3	65	68.4	127	66.8		
Attitude								
Bad	23	24.2	28	29.5	51	26.8	0.513	0.76 (0,40-1,45)
Good	72	75.8	67	70.5	139	73.2		
Practice								
Bad	39	41.1	35	36.8	74	38.9	0.655	1.19 (0.66-2.14)
Good	56	58.9	60	63.2	116	61.1		

4.1. Relationship of availability water reservoir with DHF

From the result of the research, it is found that the respondent who owns the water reservoir inside the house is 100%, the percentage of respondents who has water reservoir outside is 77.4% and the proportion in the cases group that have water reservoir outside is 80%. The results of the analysis also found that respondents who have water reservoir outside the house are at risk 1.35 times higher to be affected by DHF than respondents who do not have a water reservoir outside the house. Water supply system in the community are varies, some through piping and some sources from dug wells and etc. Therefore, people still need water reservoirs either big or small tubs, buckets, and others.

Efforts that can be done is a yard or garden around the house should be clean of from objects that allow to accommodate clean water, especially in the rainy season. Doors and windows of houses should be opened every day, from morning until afternoon, so that fresh air and sunlight can enter, and making the exchange of air and healthy lighting. Thus, creating an environment that is not ideal for mosquitoes. To avoid that mosquitoes for putting their eggs in water reservoirs we need to drain the water reservoir maximum once a week so that mosquito eggs can not develop into adult mosquitoes that can be ready to transfer DHF. In addition, another efforts than can be done is by eliminating mosquitos breeding places such as vases, flowerpot, bamboo, leaf and wide base of leaves or water reservoir that can accommodate rain water.

4.2. Relationship of conditions of water reservoir with incidence of dengue fever

The results found that the respondents who have not a cover on water reservoir 47.4% and the proportion in case group who have not a cover on water reservoir 46,3%. Statistically, the conditions of cover water reservoir with DHF were not significant in Panongan. Mahardika (2009) also said that there was a significant relationship between the conditions of cover water reservoir with DHF. Badrah and Hidayah (2011) defines a water reservoir without a cover that risk was an open water reservoir r or is not fully closed.

4.3. Relationship of knowledge with incidence of dengue fever

The data showed that respondents with the low knowledge are 33.2% and the proportion in cases group with the low knowledge are 34.7%. The results found that level of knowledge with DHF were not significant. Statistically, respondents with the low knowledge level are at risk of dengue 1.15 times higher than respondents with the high knowledge level.

Similar to Fathi, et al (2005) that knowledge with DHF were not significant in Mataram (p> 0.05). However, there is a literature said that knowledge will influence to DHF, because knowledge has an effect on changes in population behavior. Suhardiono (2005) said that the p value = 0.015 (p <0.05), it means that there were a significant relationship between level of knowledge with DHF.

4.4. Relationship of attitude with incidence of dengue fever

Attitude is a response to a particular stimulus or object, which has connected the opinion and emotional factors (happy-unhappy, agree-disagree, good-bad, etc.) [11]. The result of the research shows that respondents who have bad attitude is 26,8% and the proportion in cases group which have bad attitude is 24,2%. The analysis of respondents' attitude relationship with DHF incidence in Panongan showed no significant relationship. In contrast to Suhardiono's research (2005) which explains that there is a relationship between attitude with the incidence of DHF (p value = 0.016)..

4.5. Relationship of practices with incidence of dengue fever

Practice is one component of behaviors that is an open response from someone to a stimulus or object in the form of behavior. According to Sunaryo (2006) after a person knows the stimulation or object of health, then make an assessment or advice to what is known, the next process is expected he will implement or practice what he knows.

From the result of the research, it was found that the respondents who had bad practices were 38,9% and the proportion in case group which had bad practices was 41,1%. Analysis of the relationship of respondents' practices with DHF incidence in Panongan showed no significant relationship. In contrast to research conducted by Suhardiono (2005) that there is a relationship of practices with the incidence of DHF (p value = 0.001).

5. CONCLUSION

The analysis showed that water reservoirs and behavior factor is not significant. Eradication of dengue can be done with community empowerment that leads to positive behavior among others to make the effort of draining, closing, and burrying the water reservoir.

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