

Community Behavioral Factors Associated with Cases of Clinical Filariasis in Banyuasin Districts of South Sumatera Indonesia

Ibrahim Edy Sapada, Chairil Anwar, Salni, and Dwi Putro Priadi

Abstract— Background: Filariasis is a tropical chronic disease due to microfilariae and spread by mosquitoes bites of *Aedes*, *Mansonia*, *Anopheles*, *Culex* and *Armigeres*. In the year of 2012 there was 142 cases of clinical filariasis in Banyuasin districts. The case of filariasis spread by many environmental factors especially swamp water and pool area with many water plants. The other factors are socio-economic and behavioral community. The objectives of the research was to determine the Community Behavioral Factors such as the habits of the community that may cause of filariasis cases in Banyuasin districts.

Method: This research was an analytic survey approach with a case control study. The population of this research were all of a case of filariasis in Banyuasin districts in 2012. The cases of these research and the controls were 132 respondents by the ratio of cases and the controls were 1: 1. The Data was taken by observation and interview. After the collect the data, it was Analyzed by using the chi-square test and logistic regression.

Results: Bivariate analysis by chi-square test Showed that from 4 variables, there were 3 variables were probes to be the risk factors of filariasis at Banyuasin districts, they which are: the habit by using mosquitoes net with p value = 0.013 and OR = 2.682, the habits of to go out of the house in the night with p value = 0.021 and OR = 2.444 and the habits to eat the drug of filariasis with p value = 0.006 and OR = 13,000.

Conclusion: Community Behavioral factors such as the habit of using mosquitoes net, go out of the house in the night and the habits of do not eat the drug of filariasis may cause of filariasis. It is Necessary to perform health promotion and extend the information related to the filariasis.

Keywords—Filariasis, Community Behavioral, Banyuasin Districts

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I. INTRODUCTION

FILARIASIS is a contagious disease, caused by chronic filarial worms are transmitted by various species of mosquitoes, which consists of the genus *Aedes*, *Mansonia*, *Anopheles*, *Culex*, *Armigeres*. There are three species of worms that cause filariasis: *Wuchereria bancrofti*, *Brugia malayi*, and *Brugia timori*. All of these species are found in Indonesia, but more than 70% of cases of filariasis in Indonesia caused by *Brugia malayi*. The worms live in the lymph nodes and channels, causing damage to the lymphatic system, which can cause acute and chronic symptoms. Acute symptoms such as recurrent fever and inflammation of lymph nodes and channels (adenolymphangitis) especially in the groin area and armpits, but can also be in other areas. Chronic symptoms caused by blockage of lymph flow, especially in the same area with inflammation and cause symptoms such as elephantiasis (elephantiasis), breast augmentation and hidrokela.^{[3], [12], [15]}

Elephantiasis is a major cause of disability, social stigma, psychosocial barriers that persist and decreased work productivity of individuals, families and communities, causing huge economic losses. The results of the study together with the Department of Health School of Public Health, University of Indonesia (FKM-UI) in 2000, showed that the cost required by a patient with elephantiasis per year is about 17.8% of all household expenditures, or 32.3% of the cost for a meal. Thus, the patient will be borne by the family and the state.^{[1], [3], [12], [15]}

Since 2002, Indonesia has conducted programs to eradicate elephantiasis disease in endemic areas. However, because of the vast area of endemic and limited funds and facilities, there is much that can be done to reduce the morbidity and disability caused by the disease. With the development of science, in 1994 the World Health Organization (WHO) has declared that the elephant leg disease can be eliminated. In 1997 the World Health Assembly made a resolution on the elimination of elephantiasis and in 2000 the WHO has set a global commitment to eliminate elephantiasis ("The Global Goal of Elimination of Lymphatic Filariasis as a Public Health Problem by the Year 2020").^{[3], [15]}

National Program for the Elimination of diseases elephantiasis and Action Plan of 2002-2006 has been arranged and approved by WHO to be implemented gradually.

Launching the start of the elimination of filariasis in Indonesia nationwide was conducted on 8 April 2002 in Mainan village of Banyuasin district of South Sumatra Province by the Ministry of Health of the Republic of Indonesia, and is one of the priority programs.^{[3], [15]}

As we know the chain of transmission of filariasis occurs when there are three elements, namely: 1). Source of infection, human blood containing microfilariae 2). Vectors, namely mosquitoes and 3). Humans are susceptible.

In terms of environmental factors supporting a very influential factor is:

1. The physical environment (such as water or a puddle of water, basic water, water surface area, water depth, water flow, water clarity and illumination).
2. Biological Environment (presence of water plants as mosquito breeding place of *Mansonia* spp).
3. Social, economic and cultural (behavior, customs, culture, customs and traditions of the population, work habits).

Filariasis disease is still a public health problem in the District Banyuasin seen from the number of patients with chronic filariasis is not reduced, there is even a tendency to increase, although efforts have been made to the treatment of patients with filariasis.^{[2], [3], [10], [12]}

Based on the existing theory, the existence of the swamp as the physical and biological environment of the mosquito breeding places of mosquitoes as one of the chain of transmission of filariasis. The existence of a swamp in an area must be accompanied by measures to ensure that it does not become a swamp area where mosquito breeding is the vector of transmission of filariasis. In this case the presence of aquatic plants such as water hyacinth (*Eichornia crassipes*) can cause a breeding ground for mosquitoes as vectors transmitting. In addition, people's behavior as well as socio-economic conditions is also an important factor that contributes to the clinical filariasis cases, including medication adherence rate of filariasis for people who are already infected.^{[2], [3], [12]}

These developments provide a space to study how patterns of disease transmission of filariasis, as well as what factors are contributing to the high incidence of clinical filariasis in South Sumatra, especially in the District Banyuasin. Based on the description above, we propose five core issues in this study, namely:

1. How does the existence of a swamp environment around the house with the incidence of filariasis in Banyuasin district.
2. How does the presence of aquatic plants on the incidence of filariasis in Banyuasin district.
3. What is the influence of socio-economic risk factors (occupation, education level, income, knowledge), the habit of bed nets on the incidence of filariasis in Banyuasin district.

4. How does the influence of medication adherence in patients with filariasis on the incidence of filariasis in Banyuasin district.
5. What is the relationship linkages to environmental factors, socio-economic, behavioral and treatment in order to find a solution treatment of filariasis.

II. METHODS

This research used a case-control study approach. The method that used are as follows :

1. Bivariate analysis, is used to determine the relationship and the risk (odds ratio / OR) with a free variable bound individually by using Chi Square test p value thus obtained, 95% CI and OR.
2. Multivariate analysis, is used to determine the effect of exposure together of several factors that influence the incidence of clinical filariasis. The statistical test used is by using logistic regression.

The population of this research were all of the case of filariasis in Banyuasin district in 2012. The cases of these research and the control were 132 respondent by ratio of cases and the control were 1 : 1. The data was taken by observation and interview. After collect the data, it was analyzed by using chi square test and logistic regression.

III. RESULT

Bivariate analysis by chi-square test from 4 variable showed as follows tables :

TABLE I
RELATIONSHIP BETWEEN HABBIT OF USING MOSQUITO NETT WITH FILARIASIS OCCURANCE

Habbit of Using Mosquito Nett	Filariasis Occurance				Total	%	p value	OR
	Cases		Control					
	n	%	n	%				
No	47	71,2	32	48,5	79	59,8	0,013	2,628
Yes	19	28,8	34	51,5	53	40,2		
Total	66	100	66	100	132	100		

Confidence Interval (CI) = 1,281 – 5,394

TABLE II
RELATIONSHIP BETWEEN HABBIT OF USING MOSQUITO REPELLENT WITH FILARIASIS OCCURANCE

Habbit of Using Mosquito Repellent	Filariasis Occurance				Total	%	p value	OR
	Cases		Control					
	n	%	n	%				
No	42	63,6	47	71,2	89	67,4	0,458	0,707
Yes	24	36,4	19	28,8	43	32,6		
Total	66	100	66	100	132	100		

Confidence Interval (CI) = 0,340 – 1,471

TABLE III
RELATIONSHIP BETWEEN HABBIT OF GOING OUT FROM THE HOUSE AT NIGHT WITH FILARIASIS OCCURANCE

Habbit of Going Out From The House at Night	Filariasis Ocancecur				Total	%	p value	OR
	Cases		Control					
	n	%	n	%				
Yes	46	69,7	32	48,5	78	59,1	0,021	2,444
No	20	30,3	34	51,5	54	40,9		
Total	66	100	66	100	132	100		

Confidence Interval (CI) = 1,198 – 4,986

TABLE IV
RELATIONSHIP BETWEEN OBEDIENCE DRINGKING MEDICINE FOR FILARIASIS

Obedience Dringking Medicine For Filariasis	Filariasis Occurance				Total	%	p value	OR
	Cases		Control					
	n	%	n	%				
No	65	98,5	55	83,3	120	90,9	0,006	13,000
Yes	1	1,5	11	16,7	12	9,1		
Total	66	100	66	100	132	100		

Confidence Interval (CI) = 1,627 – 103,889

TABLE V
RECAPITULATION OF SIGNIFICANT VARIABLE WITH FILARIASS OCCURANCE IN BANYUASIN DISTRICT OF SOUTH SUMATERA

NO.	Variable	p value	OR	95% CI
1	Habbit of Using Mosquito Nett	0,013	2,628	1,1281 - 5,394
2	Habbit of Going Out From the House at Night	0,021	2,444	1,198 - 4,986
3	Obedience Dringking Medicine for Filariasis	0,006	13,000	1,627 - 103,889

The following multivariate analysis try to predict the incidence of filariasis opportunity to sample based on all respondents who have a relationship with the incidence of filariasis as shown in Table 5 above (the habits of using

mosquito nets, habit of going out of the house at night, and obedience to dring drugs) through the calculation of binary logistic regression

TABLE VI
THE RESULT OF ANALYSIS OF POTENTIAL VARIABLE WITH BINARY LOGISTIC REGRESSION WITH FILARIASIS OCCURANCE AT BANYUASIN DISTRICT IN 2013

Variable	Koefisien	S.D.	Wald	df	p	Exp (B)
Habbit of Using Mosquito Nett	-1.116	.485	5.287	1	.021	.328
Habbit of Going Out From the House at Night	-1.226	.450	7.439	1	.006	.293
Obedience Dringking Medicine for Filariasis	-3.501	1.254	7.798	1	.005	.030
Constanta	8.476	1.882	20.294	1	.000	4.800E3

Based on the logistic regression analytic toward the three potential variable, as like the table. In fact the three variables are risk factors of filariasis incidence at Banyuasin district of South Sumatera in 2013 are the habit of using mosquitoes nett, habit of going out houseat night and and the habit of dringking drugs of filariasis (p ≤ 0,05)

IV. DISCUSSION

1) Risk Factors of Habbit of Using MosquitoNett

From the results of research on the habits of the respondents use a mosquito net in Banyuasin district can be concluded that there is a significant relationship between the

habit of the respondents use the netting to the incidence of filariasis, which gained p value = 0.013 in the bivariate analysis, also on the results of the multivariate analysis with p value = 0,021.

These results are consistent with research conducted by Mulyono RA, et al (2007) on "Relationship of Environmental and Behavioral Risk Factors With the incidence of filariasis (Case Study in Pekalongan Region)", that there is a relationship between the habit of using mosquito netts while sleeping with the incidence of filariasis (p value = 0,002). The above results also in line with research conducted by Rahayu N, et al (2008), which states that there is a relationship between the habit of not using a mosquito net with the incidence of filariasis (p value = 0,012).

As is known, the mosquito as a vector-borne disease filariasis mainly bite humans at night while sleeping at night, for example, *Anopheles* spp., *Culex* spp and *Mansonia* spp. But there is also an active mosquitoes bite during the day, such as *Aedes aegypti* and *Aedes albopictus*. The habit of using mosquito nets while sleeping at night or during the day will reduce the risk of contracting the disease filariasis (elephantiasis). There should also note that the condition of mosquito netts were also influential. Based on interviews and field observations there are netts used by the respondent is not intact (tear), so this will also be the entry point for mosquitoes in the body there microfilariae to bite and transmit filariasis to the others. But keep in mind also that the use of mosquito netts while sleeping would be meaningless if it is not used routinely by someone.

2) Risk Factors of Habit of Going Out From The House at night

From the results of research on the habit of the respondents to going out of the house at night in Banyuasin district can be concluded that there is a significant relationship between the habit of the respondents with the incidence of filariasis, which gained p value = 0.021 in the bivariate analysis, also on the results of the multivariate analysis with p value = 0.006.

These results are consistent with research conducted by Mulyono RA, *et al* (2007), which there is a significant relationship between the respondents usually go out at night with the incidence of filariasis (p value = 0.011). The above results also in line with research conducted by Rahayu N, *et al* (2008), which states that there is a significant correlation between the behavior of the respondents were not good, for example, spend the night in the garden / field with the incidence of filariasis (p value = 0.011).

The habit of going out at night is actually related to activities conducted outside the house at night. As already indicated that mosquitoes as vectors of disease transmission of filariasis most often bite at night, although there were bite during the day. Based on interviews with respondents in mind that the people in the studies conducted have a habit to get out of the house, especially while the marriage ceremony or sedekahan. In addition, most of the livelihood of the respondents. So the activity out of the house to spend the night in the garden or rice field can not be avoided. This is compounded by the habit of some of the respondents who did not wear protective clothing when outdoors at night, which allows contact with the mosquitoes. Of course this also has relationship with the level of knowledge of the respondent.

3) Risk Factor of Obedience Drinking Drugs of Filariasis

Based on the results of a study of obedience in taking medicine of the respondents in the Banyuasin district, it can be concluded that there is a significant relationship between adherence of respondents taking the drug of filariasis with the incidence of filariasis, which gained p value = 0.006 in the bivariate analysis, also on the results of the multivariate analysis with p value = 0.005.

Based on the rapid survey and inspection of the finger blood filariasis from 1983-2002, Banyuasin district is one of the most common district in the province of South Sumatra with chronic filariasis cases. The Mf rate (microfilaria rate) was 2.02% ($\geq 1\%$), thus including the endemic areas and filariasis elimination program implemented by giving mass treatment in the community in the district of Banyuasin, both suffering from filariasis cases or not. The trick is by giving prevention of mass drug administration in the form of DEC, Paracetamol and Albendazol single dose once a year for at least 5 years in a row.

From interviews conducted through questionnaires to the respondents, the majority of respondents did not regularly and some have not been taking drugs filariasis given / obtained from health workers. In fact, as it is known that a person in whom there microfilariae, then he will be one source of disease transmission of filariasis (elephantiasis) in addition to another host (host reservoir, such as monkeys) to others who are healthy.

From the explanations above and reinforced by the results of interviews through questionnaires to the respondents, and the results of statistical tests that have been disclosed above, the researchers assume that there is a relationship between taking medication adherence filariasis obtained / derived from health care workers with the incidence of filariasis

V. CONCLUSION

From the analysis and discussion, it can be taken some conclusions as follows:

1. The variables are the risk factors on the incidence of filariasis (elephantiasis) in the district of South Sumatra province Banyuasin, namely:
 - a. Risk Factor of Habit of Using Mosquito Nett. The risk factor for the incidence of filariasis with p value = 0.013 ($p < 0.05$), and the *OR* of 2.682 in people who do not usually use mosquito nett compared with those who used to use a mosquito nett.
 - b. Risk Factors Habit of to go out of the house in the night. The risk factor for the incidence of filariasis with p value = 0.021 ($p < 0.05$), and the *OR* of 2.444 in people who have a habit of going out at night compared with those who do not have the habit of going out at night.
 - c. Habbits to eat drug of filariasis.

The risk factor for the incidence of filariasis with p value = 0.006 ($p < 0.05$), and *OR* by 13,000 in the non-adherence were compared with those who filariasis adherence filariasis.
2. The variables that are not related and is not a risk factor for the incidence of filariasis (elephantiasis) in Banyuasin district of South Sumatra province was habits of using mosquito repellent.

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