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- Comparison of Immunochromatography Method and Immunocytochemistry Method in Rapid Detection of NS-1 Antigen in Dengue Infection
- Filariasis Bancrofti Epidemiology Post Mass Drug Administration in Waris District Keerom Regency Province of Papua
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- Integrated and Comprehensive Action to Reduce and Control Dengue Hemorrhagic Fever: A Survey in Pekalongan City, Central Java

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Filariasis Bancrofti Epidemiology Post Mass Drug Administration in Waris District Keerom Regency Province of Papua

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ABSTRACT

Introduction: Filariasis remains to be world's health problems including Indonesia. Based on survey conducted in 2009, the occurrence cases in Indonesia reached 11.914 chronic cases. Further, there were 59 chronic cases in Keerom Regency in 2005. The number of chronic filariasis cases in Waris District reached 25 cases, with 12 people were having positive microfilaria bancrofti.

Objectives: The aim of study to find out epidemiology of filariasisbancrofti after collective treatment in Waris District, Keerom Regency, Papua.

Methods: This study used descriptive research method with cross sectional design. Data were collected by finger blood survey, survey of acute morbidity rate, survey of chronic morbidity rate, microfilaria periodicity survey, and L3 examination on mosquitoes.

Results: Survey finger blood taken from 517 samples showed 32 positive microfilariae, and filariasis prevalence of 6.19%. There were 13 patients (2.15%) having acute symptoms of filariasis, and 24 patients (4.64%) have symptoms of chronic filariasis. From the examination and dissection of 358 mosquitoes, there were nolarvaestage 3(L3). From 7 people having microfilaremia, there were periodic nocturnal 71.43% and subperiodic nocturnal 28.57%.

Conclusion: The prevalence of filariasis was 6.19%. There were 13 people having acute morbidity (2.51%), and there were 24 chronicmorbidity (4.64%). There was no L3 found from dissected 358 mosquitoes. Periodicity of microfilariae in Waris District were periodic nocturnal 71.43% and nocturnal subperiodic 28.57%.

Keywords: epidemiology, filariasis bancrofti, finger blood survey

INTISARI

Pendahuluan: Filariasis masih merupakan masalah kesehatan masyarakat di dunia termasuk Indonesia. Di Indonesia berdasarkan survei tahun 2009 sebanyak 11.914 kasus kronis, di Provinsi Papua terdapat 1.158 kasuskronis. Kabupaten Keerom tahun 2005 tercatat sebanyak 59 kasus kronis. Jumlah penderita kasus kronis filariasis di Kecamatan Waris ada 25 kasus kronis dengan 12 orang positif mikrofilaria bancrofti.

Tujuan: Penelitian ini dilakukan untuk mengetahui epidemiologi filariasis bancrofti pasca pengobatan massal di Kecamatan Waris, Kabupaten Keerom, Papua.

Metode: Metode penelitian menggunakan deskriptif dengan desain *cross sectional*. Pengumpulan data dilakukan dengan survei darah jari, survei angka kesakitan akut dan angka kesakitan kronis, survei periodisitas mikrofilaria, serta pemeriksaan L3 pada nyamuk.

Hasil: Hasil survei darah jari (SDJ) sebanyak 517 sampel ditemukan 32 sampel positif mikrofilaria.

Prevalensi filariasis sebesar 6,19%. Terdapat 13 penderita (2,15 %) memiliki gejala akut filariasis, 24 sampel (4,64%) memiliki gejala kronis filariasis. Pemeriksaan dan pembedahan 358 ekor nyamuk tidak ditemukan larva stadium 3 (L3). Dari 7 penderita mikrofilaremia ditemukan periodik nokturnal sebesar 71,43% dan subperiodik nokturnal sebesar 28,57%.

Simpulan: Prevalensi filariasis sebesar 6,19%. Angka kesakitan akut terdapat 13 orang (2,51%), angka kesakitan kronis terdapat 24 (4,64%), dan tidak ditemukan L3 dari 358 nyamuk yang dibedah. Periodisitas microfilaria di Kecamatan Waris adalah periodik nokturnal sebesar 71,43% dan subperiodik nokturnal sebesar 28,57%.

Kata kunci: epidemiologi, filariasis, survei darah jari

INTRODUCTION

Filariasis can be found in all over the world notably in tropical regions and some subtropical regions. In 2004, filariasis had infected 120 million people in 83 countries around the world. In Asia, endemic filariasis occurs in Indonesia, Myanmar, India and Srilanka¹.

In 2000 WHO declared “*The Global Goal of Elimination of Lymphatic Filariasis as a Public Health Problem by the Year 2020*”). Indonesia has established the elimination of filariasis in filariasis endemic areas by conducting mass treatment using *Diethyl carbamazine citrate (DEC)* and *albendazole* 1 year once in 5 years, and by giving treatment for acute and chronic clinical cases in order to prevent disformity². Filariasis is wide spread in almost all provinces. In 2009 based on the number of cases per province there were provinces with the highest number of clinical cases of filariasis, those were, Nanggroe Aceh Darussalam, East Nusa Tenggara, Papua and West Irian Jaya. The report of the district or city mentioned that the cases reached 11 914 clinical cases³.

In 2010, there were 1,447 cases of chronic filariasis occurring in almost all districts or cities in Papua. Keerom is one of districts that consists of 5 sub-districts with population of 50.416 inhabitants within an area of 912 km². The handling of filariasis began in 2005 which is initiated by a survey of chronic filariasis cases. The result of the old survey found that 59 cases of chronic filariasis was found in 5

districts. In Arso Kota District, there were 25 cases, 4 cases found in Arso Barat District, 1 case was found in Arso Timur District, 4 cases in Arso III District and 25 cases in Waris District. Mass drug administration has been conducted since 2007. After the third year of treatment, a survey of finger blood was conducted in 2011 by the Health Office of Papua Province in the Waris District, Keerom. It showed micro filarial rate of 3.43%.

RESEARCH METHOD

This research was designed as descriptive study with cross-sectional. A research design which examines an event at one point to wards the independent variables and the dependent variable conducted simultaneously⁴.

Research location was in Waris District, Keerom Regency, Province of Papua. Research variable in human consist of finger blood survey, inspection periodicity of micro filariae and micro filariae, whereas in mosquito used L3 treatment.

For survey of acute or chronic disease rate, examination of the clinical symptoms of filariasis carefully to every 500 people who have been willing to do surveys finger blood¹.

For mosquito survey, mosquitoes catching was conducted from 6 pm to 6 am. Adult mosquitoes were caught by using placing mosquitoes trap outside the house of microfilaria positive patients by using a light trap. Trap light was simply hung outside. Distance between light trap with ground is + 1 m.

Catching mosquitoes with aspiratoras the bait was also conducted. Mosquitoes captured were grouped and identified according to the identification key, taken care for ± 12 days, then determination of mosquito larvae in the body was done¹.

The survey of microfilariae periodicity was conducted after obtaining the patient with positive microfilariae from the finger blood survey examination¹. People with positive microfilariae obtained from finger blood survey were re-examined in order to find out their microfilariae periodicity. In each iperiodicity examination, blood was taken from fingertips up to 20 mL using a lancet and capillary tube every 4 hours for 24 hours (n=6 times). Staining

of blood clots had similar procedures as finger blood survey.

Data analysis described the prevalence of finger blood survey (Mf rate), the results of microfilariae, L3 examination on mosquito vectors and the result of microfilarial periodicity. Data are presented in tables and graphs.

RESULTS AND DISCUSSION

Finger blood survey

Table 1 showed that by 517 of samples, there are 32 subjects found consist of 16 men and 16 women positively got microfilariae in their capillary.

Table 1. The survey result of finger blood based on Age and Gender in District Waris, Keerom Regency, Papua

Group of Age	Positive				Negative				Total	
	M		W		M		W		N	%
	n	%	N	%	n	%	N	%		
2-10	4	0,8	1	0,19	76	15	91	17,6	172	33,3
11-20	3	0,6	1	0,19	53	10	70	13,54	127	24,6
21-30	4	0,8	5	0,97	26	5	48	9,28	83	16,1
31-40	4	0,8	3	0,58	25	4,8	30	5,80	62	12
41-50	1	0,2	3	0,58	30	5,8	12	2,32	46	8,9
51-60	0	0	2	0,39	7	1,4	9	1,74	18	3,48
>60	0	0	1	0,19	5	1	3	0,58	9	1,74
Total	16	3,1	16	3,09	222	43	263	50,87	517	100

The result of finger blood survey after five year mass drug administration (2013) in DistricWaris, Keerom Regency Papua shows the increasing rate of microfilaria 6,19%, compared to the microfilaria rate in mass treatment year three (2011) based on SDJ by Provincial Department of Health 3,43%. This result is different from the research conducted by Tjokropranoto (2008) in Subang Western Java before the mass treatment with DEC and Albendazole in which there is *Mf rate* 1,89%; after the mass

treatment year three (2008) with DEC and Albendazole, the result decreases to 0,00%⁵.

Filariasis treatment in Keerom Regency especially in District Waris should be re-planned based on the successful elimination program by Joseph (2010) *cit*Setiawan (2012), the successful elimination program needs accurate spreading out transmission, comprehensive surveillances strategy to detect the spreading source and mass treatment campaign by using cultural approach and education⁶.

Acute Disease Rate (ADR)

Table 2 showed that by 517 of samples, 13 people (2,5%) were found having acute filariasis symptoms who often get fever and limfadenitis.

The Acute Disease Rate in SDJ showed that from the 32 people who are positively got mikrofilaria, 13 of them have clinically symptoms of acute microfilaria and the other 19 have a simptomatik microfilaria. This research result is the same with Ramadhani’s research result (2008) in Pekalongan in which the people who do not show clinically acute filariasis more than them who has clinically acute

symptoms. Partono and Purnomo (1987) that the clinically acute symptoms of *B.malayi* and *B.timoriis* more real compare to *W. bancrofti*. The people with filariasis bancrofti barely have limfodema and limfang it is rather than the filariasis malayi and filariasis timori^{7,8}.

Chronic Disease Rate (CDR)

Table 3 showed that by 517 of samples, 24 people (4,64%) are found have Chronic Filariasis symptoms of elephantiasis.

Table 2. Acute Filariasis Disease Rate based on Group of Age and Gender in District Waris, Keerom Regency, Papua

Group of Age	Acute Disease Rate (ADR)				Total	
	M		W		N	%
	n	%	N	%		
2-10	2	0,39	0	0	2	0,39
11-20	2	0,39	1	0,19	3	0,58
21-30	1	0,19	1	0,19	2	0,39
31-40	3	0,58	3	0,58	6	1,16
41-50	0	0	0	0	0	0
51-60	0	0	0	0	0	0
>60	0	0	0	0	0	0
Total	8	1,55	5	0,97	13	2,51

Table 3. Chronic Filariasis Disease Rate based on Group of Age and Gender in District Waris, Keerom Regency, Papua

Group of Age	Chronic Disease Rate (CDR)				Total	
	M		W		N	%
	n	%	N	%		
2-10	0	0	0	0	0	0,00
11-20	0	0	0	0	0	0,00
21-30	1	0,19	0	0	1	0,19
31-40	2	0,39	7	1,35	9	1,74
41-50	6	1,16	4	0,77	10	1,93
51-60	3	0,58	0	0	3	0,58
>60	1	0,19	0	0	1	0,19
Total	13	2,52	11	2,12	24	4,64

From the acquired data, most people with the symptoms of chronic filariasis are men at the age of 21 years and above; while the women are at the age of 31 years and above. In common, the incident of filariasis infection on men is higher than women because they have more chances to get the infection as they often have contact with the vector as their occupations also have more real symptoms because of the harder physical occupations¹. Sumarni and Soeyoko (1998) say that men has more risk to get filariasis infection rather than women, but it is statistically meaningless⁹. There are differences between filariasis malayi and filariasis timori from

filariasis bancrofti. In Filariasis Bancroft, the swollen in leg or arm can happen three times bigger than the normal condition. Sometimes, the occurrence of elephantiasis or hidrokela is not preceded by acute stadium. This condition is different from filariasis malayi dan filariasis timori that are always preceded by acute stadium⁸.

Mosquito dissected to detect larva stadium 3 (L3) *W. bancrofti*

Table 4 showed that by 358 of caught mosquitoes, the majority were *Culex quinquefasciatus* 55.31%. There are no larva stadium 3 (L3) *W. bancrofti* found in the dissection.

Table 4. The Result of Mosquito Dissected in District Waris, Keerom Regency, Papua

No	Types of Mosquito	Number of Mosquito		Dissection Result	
		(ekor)	(%)	Positive	Negative
1	<i>Ae. albopictus</i>	2	0,56	0	2
2	<i>Ae. aegypti</i>	6	1,68	0	6
3	<i>Culex quinquefasciatus</i>	198	55,31	0	198
4	<i>Anopheles sp.</i>	152	42,46	0	152
Total		358	100	0	358

This research showed that the surgery on 358 mosquitoes does not find larva stadium 3 (L3). This result is the same as Setiawan's research (2012) in District Kota Besi, Eastern Kotawaringin Regency, Middle Borneo Province and Edyansyah's research (2011) in Muara Padang village, District Muara Padang, Banyuasin Regency, Southern Sumatra in which the caught mosquitoes do not have larva stadium 3 (L3) of *B. malayi*^{6,10}. Atmosoedjono et al (1977) cit Soeyoko (1998) says that if the number of microfilaria is too small, therefore only a small part of the mosquitoes who can suck microfilaria. On the

other hand, if the number of microfilaria is too many, the mosquitoes that suck microfilaria will die. Not all of microfilaria that enters the mosquito's stomach can survive developing into larva as about 40% of them die in the mosquitoes's stomach¹¹.

Periodicity of Microfilarie

Table 5 showed that the period of Microfilariae period from 7 filariasis bancrofti carrier, the 71.43% was periodic nocturnal and the 28,57% is subperiodic nocturnal.

Table 5. Periodicity of Microfilariae in DistricWaris, Keerom Regency, Papua

No	Name (Alias)	Age	Gender	Time of Blood Sampling and Result					
				20.00	24.00	04.00	08.00	12.00	16.00
1	SW	10	L	44	28	54	0	0	0
2	YT	38	P	6	7	14	0	0	0
3	IW	18	L	88	146	133	101	42	91
4	IM	18	L	4	7	8	0	0	0
5	MD	45	P	33	22	13	0	0	1
6	CW	49	P	36	23	23	10	3	5
7	WD	29	P	184	125	58	0	0	0

The research result with 24 hours of SDJ taken from the period of microfilaria on 7 citizens with positive microfilaria in Distric Waris, Keerom Regency, Papua shows 71,43% nocturnal periodic and 28,57% nocturnal subperiodic. Sandjaja (2007) says that the periodic of microfilaria *W. bancrofti* can be nocturnal subperiodic, nocturnal periodic, and diurnal periodic (found in Pacific)¹². Mc Mohan *et al* (1996) *cit* Hayuningtyas and Subekti (2007), that each cause of filarial has different period related to the vector behavior, the cycle of sirkardian host and case area. The period will change if the main vector behavior changes because of the pressure in its life cycle. The revolutionary pressure in its life will affect changes in spreading and period of microfilaria. The cycle of sirkardian host is related to the host's activity. The change in host's activity will also affect sirkardian cycle and the period of mikrofilaria¹³.

CONCLUSION

The conclusion from this research result are prevalence of filiariasis 6.19%, acute and chronic disease rate were 2.51% and 4.64%. There was no larva stadium 3 (L3) found in the surgery of 358 mosquitoes. The period of microfilaria found nocturnal periodic was 71,43% and subperiodic nocturnal was 28,57%.

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- f. Results and Discussion:** The Results should be presented with clarity and precision and explained without referring to the literature. The original and important findings should be stated. The Results should be illustrated with figures or tables where necessary but these should be kept to the minimum. The Discussion should interpret the findings in view of the results obtained against the background of existing knowledge. The Discussion should highlight what is new in the paper. Any assumption on which conclusions are made must be stated clearly
- g. Conclusions:** State the Conclusions in a few sentences at the end of the paper.
- h. Acknowledgments:** The Acknowledgments should be presented at the end of the text and before the references. Technical assistance, financial support and advice may be acknowledged.
- i. Tables:** The tables should be kept to a minimum and be designed to be as simple as possible. Each table should be numbered consecutively in Arabic numerals and supplied

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..... it has been reported¹

..... according to Sardjito²

..... Winstein & Swartz³ conducted

..... by Avon *et al.*⁴

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Sample References

Scientific Journal

1. *Standard journal article*

You CH, Lee KY, Chey RY, Menguy R. Electro-gastro-graphic study of patients with unexplained nausea, bloating and vomiting. *Gastroenterology* 1980; 79(2):311-14.

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