

Risk Factors for Malaria Incidence in Kairatu Sub-District

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Abstract

Annual Parasite Incidence (API) in Kairatu Sub-District, SBB Regency, Maluku is still high. This study aims to analyze the risk factors for malaria incidence in Kairatu, using a case-control design. The research subjects were 54 people consisting of: 27 people in the case group and 27 for the control group. The level of risk was expressed in Odd-Ratio (OR). The OR for “habit of outdoors” was 8.312, OR for “not using mosquito nets” was 10.450, OR for “not using mosquito repellent” was 19.00.

Keywords: malaria, incidence, risk factors

Introduction

Malaria is an emerging and reemerging disease, which until now still poses a serious threat to people living in tropical and subtropical regions, especially in high or moderate malaria endemic areas, both closed and open communities.^{(1),(2)}

In Indonesia, Maluku is the highest malaria endemic province after Papua, West Papua and NTT, with a high Parasite Rate of >5%. In 2013, malaria positive cases were 16.508%, Annual Blood Examination Rate (ABER) was 3.32%, Slide Parasite Rate (SPR) was 29.34% and Annual Parasite Incidence (API) was 9.76%. In 2014, malaria positive cases were 13.307%, ABER was 3.76%, SPR was 21.50% and API was 8.10%. In 2015, Annual Malaria Incidence (AMI) was 7.057%, a positive case was 2.298%, already treated was 2.278% and API was 10.87%. Whereas in 2016, API was 6.70%.⁽³⁾

In SBB Regency in 2014, API was 8.06%, SPR was 22.39% and ABER was 3.60%. In 2015, the API was 10.87%, SPR was 32.56% and ABER was 3.36%. Whereas in 2016, API was 8.06%, SPR was 22.39% and ABER was 3.60%.⁽⁴⁾

In Kairatu sub-district there is a Kairatu Public Health Center which serves 15,731 residents. This area is included as malaria endemic with 27 cases in 2016, consisting of 20 males and 7 females, with the highest API in May which is 1.8 per thousand inhabitants.⁽⁵⁾

This study aims to analyze the risk factors for malarial events in Kairatu Subdistrict, SBB Regency, Maluku, Indonesia.

Method

This observational study used a case-control design. The risk factors for malaria incidence studied were: 1) the habit of being outdoors at night, 2) the use of mosquito nets during sleep, and 3) the use of mosquito repellents. The sample size was 54, which was divided into two groups, namely: 1) case group = 27 people, and 2) control group = 27 people. The case criteria were patients who visited the public health center, with clinical symptoms of malaria, and proved by the results of microscopic examination with positive results of suffering from malaria, while the control criteria were patients who visited public health centers, which were negative based on microscopic examination. Data was presented descriptively in the form of a table of frequencies⁽⁶⁾, then the level of risk factors was expressed in OR.

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Findings and Discussion

Table 1. Distribution of Characteristics of Respondents (Age, Gender and Occupation) of the Control Group and Case Group

Variable	Control		Case	
	n	%	n	%
Age (Year)				
• 0 – 5	7	13.0	7	13.0
• 6 – 11	5	9.3	5	9.3
• 12 – 25	7	13.5	7	13.5
• 26 – 45	5	9.3	5	9.3
• 46 – 65	2	3.7	2	3.7
• > 65	1	1.9	1	1.9
Gender				
• Male	15	27.8	16	29.6
• Female	12	22.2	11	20.4
Occupation				
• Does not work	12	22.2	15	27.8
• Civil servants	1	3.7	1	1.9
• Traders	2	1.9	2	3.7
• Farmer	2	3.7	1	1.9
• Fisherman	1	1.9	2	3.7
• entrepreneur	4	7.4	3	5.6
• Housewife	5	9.3	3	5.6

Table 2. Distribution of Risk Factors for Malaria

Variable	Control		Case		OR
	n	%	n	%	
The habit of being outdoors at night					
• Yes	6	22.2	19	70.4	8.312
• No	21	77.8	8	29.6	
The use of mosquito nets during sleep					
• Yes	5	18.5	19	70.4	10.450
• No	22	61.5	8	29.6	
The use of mosquito repellents					
• Yes	8	29.6	24	88.9	19.00
• No	19	70.4	3	11.1	

The Habit of being Outdoors at Night

The results showed that the activity of being outdoors at night was a risk factor for malaria incidence with OR = 8.312. It can be interpreted that someone who has the habit of being at home at night without using personal protection has a risk of experiencing malaria 8.3 times more than people who do not do outdoor activities at night. This is related to the behavior of the Anopheles mosquito, which has the habit of actively sucking blood at night. A person is potentially infected with malaria because the Anopheles mosquito is exophagic which actively seeks blood outside the home at night. The habit of doing activities outdoors at night will be increasingly risky if people who are accustomed to outside the house do not wear protective clothing, such as long-sleeved shirts or other protectors.

The results of this study are in accordance with the results of the Babba (2016) study in the Jaya Pura Health Center Work Area which reported that people who had the habit of doing activities outdoors at night without wearing protective clothing had a 5.5 times greater risk of malaria infection than those who did not do outdoor activities at night.⁽⁷⁾ Similar results were also reported by Sillehu (2009) that in the SBB district there was an association between the habit of being outdoors at night and the incidence of malaria.⁽⁸⁾

The Use of Mosquito Nets during Sleep

The results of data analysis showed that the behavior of not using mosquito nets during sleep was a risk factor for malaria incidence with a high OR of 10,450, meaning that someone who did not use a mosquito net while sleeping was 10.4 times more at risk of being infected with malaria. The habit of using insecticide-treated bed nets is very effective in avoiding and preventing contact between mosquitoes and healthy people during sleep at night. In general, Anopheles mosquitoes actively suck blood at night. The first peak of creativity occurs before midnight and the second peak is near morning. From the results of the survey in the field it was found that respondents who had semi-permanent boarding houses, almost all of them used mosquito nets obtained from Kairatu Community Health Center, while respondents who owned stone / wall houses generally used mosquito repellent in electric preparations, spray, burn and topping.

The significant effect of using insecticide-treated bed nets is in accordance with the results of a study

conducted by Jambulingan in India that since the use of insecticide-treated bed nets, 74.5% - 76.6% of the respondents observed were less frequently smoked by mosquitoes and there was a decrease in malaria incidence of 7.2% -32.1%.

The results of research conducted by Husin (2014) at the Sukamerindu Community Health Center, Sungai Serut Subdistrict, showed that someone who slept without mosquito nets at night had a risk of being infected with malaria 5.8 times greater than people who slept using mosquito nets at night.⁽⁹⁾ The results of this study are also in line with the findings of Munawar (2014) in Sigeblog Village, Banjar Negara Regency, Central Java, that people who slept without mosquito nets at night had an infection risk of 8.09 times greater than those who slept using mosquito nets at night.⁽¹⁰⁾

The Use of Mosquito Repellents

The results of data analysis showed that the habit of not using mosquito repellent was a risk factor for malaria incidence with OR = 19.00, meaning that someone who did not use mosquito repellent was 19 times more likely to be infected with malaria. The use of mosquito repellent is mostly done by the community because it can be obtained at cheap prices, can be used easily (practically) at a price, and can prevent direct contact between the human body and mosquitoes for 4-10 hours. The survey results in the field show that respondents who work as fishermen, farmers, and housewives generally use mosquito repellents that are burned and drugs applied to the skin, which can protect from mosquito suction for 4-10 hours. Meanwhile, government officials, traders and entrepreneurs generally use spray and electric mosquito repellent, which can protect them from mosquito suction for 8 hours.

This research is also reinforced by the results of the study of Hadi (2013) which states that people who use mosquito repellent have a 2.5 times lower risk than people who do not use mosquito repellent.⁽¹¹⁾ The results of this study are also in line with the findings of Santy (2014) in Sungai Ayak Village 3, that people who did not use mosquito repellent were 2.17 times more at risk of being infected with malaria.⁽¹²⁾

Conclusion

Based on the results of the study it can be concluded that behavior does not use mosquito repellent, not using mosquito nets when sleeping at night and doing activities

outdoors at night is a risk factor for malaria incidence in Kairatu, SBB, Maluku, Indonesia. Therefore efforts to use mosquito nets, use of mosquito repellent and use protection when going out at night should always be maintained and improved.

Conflict of Interest- No

Source of Funding- Authors

Ethical Clearance- Yes

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