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Risk Factors of Malaria Incidence on Pregnant Women in Public Health Center (Puskesmas) Kalumata Work Area Ternate City

Sahnawi Marsaoly

Lecturer in Department of Midwifery Poltekes Kemenkes Ternate, Indonesia

Abstract: ***Malaria is one of the public health problems that can cause death, especially in high risk groups of infants, children under five and pregnant women. Pregnant women who suffer from malaria are at risk of abortion, born to death, premature birth, low birth weight and congenital malaria. The disease is still endemic in most parts of Indonesia including North Maluku. The purpose of this research is to know the maternal risk factors, the number of births, night outside activities, the use of insecticide-treated mosquito nets and compliance ANC with malaria incidence in pregnant women. The method used in this study is descriptive analytic with a cross sectional-approach. Results of RDT test was known that none of the respondents were positive for malaria, but there were 19 respondents (57.6%) who had malarial pain. The ρ value of all variables studied showed a number is higher than 0.05, so the results of this study provide an answer to us that the incidence of malaria in pregnant women does not have a strong correlation with age factor, the number of children, the habit of night outside activities, the use of mosquito nets, and compliance in pregnancy test (ANC). The malaria incidence in pregnant women, more due to Ternate is one of malaria endemic area in North Maluku, so the condition of the prime body during pregnancy, is highly recommended.***

Keywords: Congenital malaria, pregnancy, endemic region

1. Introduction

Malaria is one of the public health problems that can cause death, especially in high risk groups of infants, children under five, pregnant women. In addition, malaria directly causes anemia and can decrease work productivity. The disease is also still endemic in most parts of Indonesia. Malaria is the fifth largest deadly disease in the world, especially in poor countries. But anti-malarial campaigns such as easy and cheap mosquito nets, the use of friendly insecticides to protect people during sleep, managed to save about a million human lives from deadly malaria. Malaria is reported in 99 countries. WHO will try various measures to suppress the death toll from malaria worldwide. WHO in The World Malaria Report 2013 estimates 207 million cases of malaria globally in 2012 and 627 thousand people die in 2012 where in general 80% of malaria cases and 90% of people die occur in Africa. Most of the deaths from malaria occur in children under five (77%). In total, there are 3.4 billion people living in malaria risk areas (endemic) in 104 countries [1].

In Indonesia malaria still occupies a position as a contagious disease that becomes a problem to the high rate of morbidity and mortality and often cause the extraordinary incidence (KLB). In 2009, regency/city that included high endemic areas as much as 24.1% and decreased to 12.88% in 2012. Nationally malaria cases tend to decrease with the number of Annual Paracite Incidence (API) of 4.1 per 1000 population on 2005 to 1.38 per 1000 population in 2013. Malaria mortality rate in 2012 in Indonesia as many as 252 people. The pattern of disease distribution as shown above with dominance in eastern Indonesia with malaria parasite rate more than 50 per 1000 population. In general, malaria endemic sites are remote villages with poor environmental conditions, difficult transportation and communication facilities, poor access to health services, low levels of education and socio-economic conditions and poor health behaviors.

Indonesia eastern area is one of the highest malaria incidence, the number of malaria in 2012 reaches 417 thousand cases in Indonesia. Almost three-quarters of cases are from eastern Indonesia, such as Papua, West Papua, NTT, Maluku and North Maluku. The number of cases received by the government throughout 2013 was 93.2 percent. While Papua has the largest number of malaria cases, that is 42.65 percent. The annual incidence of malaria (API = Annual Parasite Incidence) in North Maluku Province in 2015 is 4.4 per thousand population which can be interpreted as moderate endemicity with the number of laboratory confirmation of 89.9%. Among those suffering from malaria 1,040 cases (20.68%) occur in children aged 0 months - 4 years and 63 cases in pregnant women. The parasite dominance is still on Plasmodium Falciparum of 61%. From the 10 regency/city in North Maluku, can be seen that Morotai Island regency is still with high case rates followed by South Halmahera Regency. As for the other 8 districts have decreased cases to moderate endemic areas. Data from the Health Office of North Maluku Province, recorded the number of pregnant women who perform malaria screaning as many as 12,525 (46.6% of the total pregnant women). The results of the integration report with child health show that 73% of fully immunized children get mosquito nets. Existing data indicate that although North Maluku has experienced a decrease in cases from previous year, it is still a threat because of the still low healthy people behavior, especially awareness to maintain cleanliness of settlements [2]. Ternate city in 2015, still found 2,918 cases of clinical malaria and 83 cases of malaria positive. Kalumata public health center (*Puskesmas*) data from January to September 2017 no one pregnant women whose laboratory

positive result malaria, but mother still there is pregnant women found clinical symptoms of malaria [8]. The formulation of issues that can be raised is; Is age, parity, outdoor activity at night, use of insecticide-treated bed nets and ANC compliance is a risk factor for malaria occurrence in pregnant women? The purpose of this research is to know the risk factors of malaria incidence in pregnant women in *Puskesmas* Kalumata workong area of Ternate city which includes, age factor, number of deliveries factor, activities outside the house at night, use of insecticide-treated bed nets and compliance in pregnancy. sovereignty and participates in democracy with its own variants. A democracy that continues to grow and flourish in its political transition process which undergoes various maturation of the political behavior of the state and its people which is expected to lead to an ideal condition of politics. As a manifestation of the implementation of democracy, elections are held on a direct, public, free, secret, honest and fair basis. This five-year agenda was held to give the widest space for the community to self-determine their representatives. This is where the elections become a means of the implementation of people's sovereignty, respect for the political rights of the people, and the noble values inherent in the soul of the Indonesia people.

2. Methodology

The method of this research is descriptive analytic with cross sectional approach conducted in *Puskesmas* Kalumata on September 2017. The population of the research were all trimester I, II and III pregnant women who visited the *Posyandu* in Puskesmas Kalumata in October 2017, while the sample was pregnant women who visited 4 *Posyandu* randomly selected. Pregnant women who were sampled were re-examined for malaria by RDT test and were given a questionnaire to record their knowledge of malaria, habits in malaria prevention and knowledge about pregnancy. The filled questionnaires were then univariate and bivariate analyzed to assess the relationship of each variable.

3. Results and Discussion

Univariate Analysis

Univariate analysis was conducted on data obtained from the questionnaires based on age, number of children, nigth outside activities, the use of insecticide-treated bed nets, compliance with ANC, and pregnant women who had suffered malaria. Analysis results are shown in Figure 1-6.

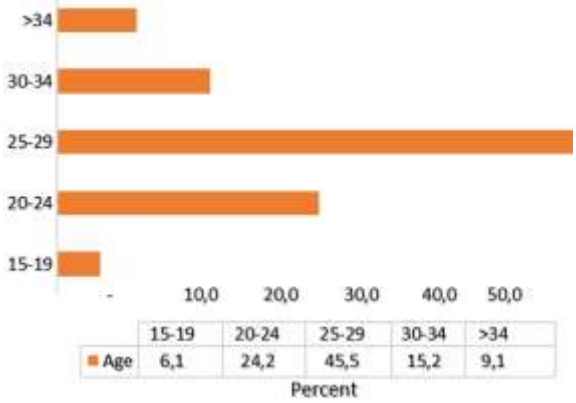

Figure 1: Distribution of pregnant women by age

Based on Figure 1, it is seen that most malaria incidence at the age of 25-29 years compared with age more than 35 years and less than 20 years. Theoretically explained that the age of 35 and over 20 years is the risk group to get pregnant, especially if exposed to malaria, The results obtained in this study showed the opposite result of the more productive age of the sick than old and young. This is related to the behavior and habits of productive people who perform night outside activities where the theory states that habit of being outdoors until late at night, where the vector is *eksofilik* and *eksofagik* will facilitate mosquito bites. Habits are outdoors at night and also do not use clothes that cover the entire body, related to the incidence of malaria [3]. The results of this study are in accordance with research conducted by Setyowati et al (2000) with the title of Low Birth Weight Infant Life in pregnancy with malaria in Jogjakarta [1].

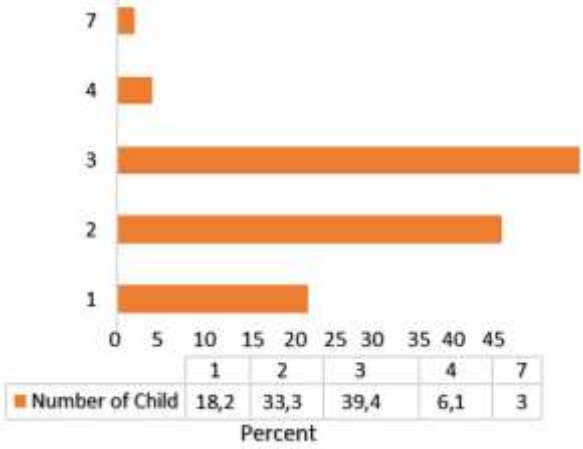

Figure 2: Distribution of pregnant women by the number of children

Figure 2 shows the distribution of pregnant women by number of children, it is known that the number of children did not significantly affect the malaria incidence. It appears that pregnant women with 1-2 children have suffered from malaria as well as pregnant women who have children more than 4. Research conducted by Rahmawati [3] giving the results of pregnant women which has the number of childbirth 0.1 or ≥ 4 has a risk of 1.15 times against the incidence of malaria compared with pregnant women who have the number of childbirth 2 or 3 because the lower and upper limit include the score 1 then the risk is considered statistically meaningless.

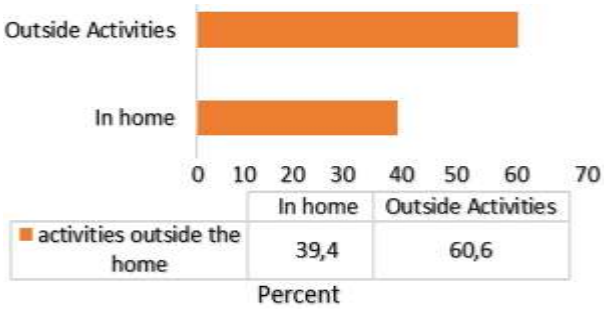

Figure 3: Distribution of pregnant women based on night outside activities

Based on Figure 3, it can be seen that night outside activities is not a risk factor of malaria incidence in pregnant women.

This is not in accordance with research conducted by Rahmawaty [3] in Papua endemic area which gives results that habit night outside activities is considered significant to malaria incidence in pregnant women. Thus, this variables are risk factors, so it can be said that pregnant women who have a habit of being night outside with a frequency ≥ 2 times the risk of malaria compared to pregnant women who never go out at night with frequency < 2 times.

The use of insecticide-treated bed nets is one of the government's efforts to support the Malaria elimination program in North Maluku in particular and Indonesia in general. The use of mosquito nets is expected to protect pregnant women from mosquito bites especially at night.

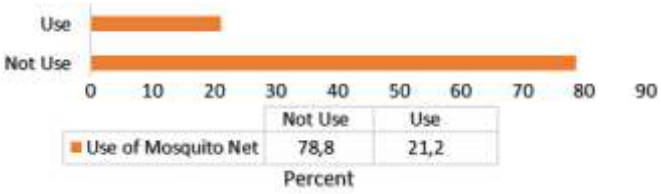

Figure 4: Distribution of pregnant women based on the use of insecticide-treated bed nets

Based on Figure 4, shows that there is no correlation between pregnant women who sleep with mosquito nets with the incidence of malaria. The results of this study were different from the results of Husin research in *Puskesmas* Sukamerindu Bengkulu City [4], people who do not use the bed nets have a risk of malaria 5.8 times greater than those who use bed nets at night. In line with the research conducted in Bulukumba South Sulawesi [5], it was found that the respondents who did not use mosquito net in the case group was 75.0% larger than the control group 72.5%, while the respondents who used the mosquito net in the case group was 25.0% smaller compared to the control group of 27.5%. The use of inseminated net bed (impregnated net) while sleeping at night was able to prevent the risk of malaria compared with those who did not use [6]. The use mosquito nets can reduce the incidence of malaria [7].

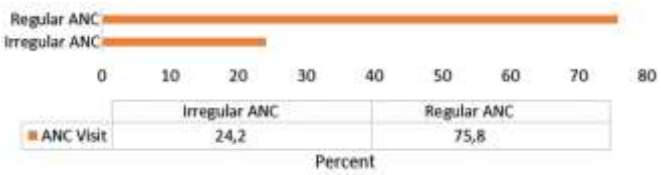

Figure 5: Distribution of pregnant women based on compliance ANC test

Antenatal Care (ANC) as one of the early prevention efforts of pregnancy risk factors. According to the World Health Organization (WHO), Antenatal Care (ANC) to detect early occurrence of high risk pregnancy and childbirth can also reduce maternal mortality and monitor the fetus condition. Ideally, if every pregnant woman is going to have her pregnancy tested, the aim is to detect any abnormalities that may arise in the pregnancy are quickly detected and immediately remedied before adversely affecting the pregnancy by performing an Antenatal Care (ANC) test [9]. Based on Figure 5, The results of this study show that pregnant women who regularly perform ANC are still exposed to malaria, the same as pregnant women who do not regularly ANC. This is contrary to research conducted by Arif Budiono and Tri Wuriastuti on factories that affect the incidence of malaria in Indonesia, in 2017 [6], gave results that pregnant women in the area of his house no practice midwife / birth home believed 95% have risk of malaria between 1,622 to 2,345 times compared to pregnant women who are close to the practice of midwives/maternity homes. The existence of midwife practice/maternity home is related to easy access of pregnant women to health service. Ease of access to pregnant women to health services will increase the frequency of pregnant women visit to check their pregnancy, and pregnant women will get an explanation of how to prevent the bite of Anopheles mosquitoes. This is in line with research conducted by Irma Rubianti [10], giving results that the regularity of ANC can suppress the incidence of malaria.

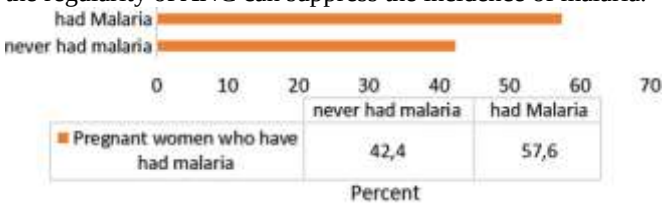

Figure 6: Distribution of pregnant women who have had malaria

Figure 6 shows the incidence of malaria to pregnant women based on the results of the study. It is seen that the incidence of malaria to pregnant women is still relatively high almost half of the total data obtained. This is due to Ternate is one of malaria endemic area in North Maluku.

Bivariate Analysis

Bivariate analysis was performed on the characteristics of respondents and malaria risk factors, especially those with probability *r* value less than 0.05. Analysis results will describe risk factors on the occurrence of malaria cases in pregnant women. Factors measurement related to malaria incidence in pregnant women include; age, number of children, night outside activities, use of mosquito nets, and routines in the ANC. From five independent variables analyzed bivariate by assessing the correlation between independent variables and dependent variables, the five variables are not one that gives a significant correlation as in the Table 1.

Table 1: Relationship between research variables with malaria incidence in pregnant women

Independent Variables	Malaria Incidence	
	r	*p*
Age of Pregnant Woman	0,026	0, 886
Number of Children	0,117	0, 516
Night activities Outside	0,186	0, 299
Use of Mosquito Net	0,155	0,391
ANC Visit	0,087	0,631

4. Conclusion

The age, number of children, night outside activities, the use of insecticide-treated bed nets, and regularity in pregnancy test which is the independent variable in this study, no effect on the malari incidence in pregnant women. Despite the results of laboratory tests and RDT, all respondents were negative malaria, but 6.1% of respondents had clinical

symptoms of malaria and 57.6% of respondents had sick malaria. Malaria incidence in pregnant women in this study more due to Ternate is a malaria endemic area in North Maluku.

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