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Relationship Of Malaria In Pregnant Women To Anemia Events In Poriaha Puskesmas, Central Tapanuli Regency In 2020

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ABSTRACT

Anemia is the presence of malaria infection during pregnancy. The purpose of this study was to determine the relationship between malaria infection and the incidence of anemia in pregnant women using Riskesdas data in 2018. The design of this study used a cross-sectional design with the number of samples that met the inclusion and exclusion criteria in this study as many as 390 respondents. Bivariate data analysis using chi-square test and multivariate risk factor model using multiple logistic regression. Univariate results showed that 38.8% of pregnant women in Indonesia had anemia. The bivariate results of this study showed a significant relationship between malaria infection (p-value; 0.015), maternal age (p-value ; 0.046), nutritional status (p-value ; 0.005), gestational age (trimester 3 (p-value ; 0.001), 2nd trimester (p-value ; 0.005), blood tablet compliance (p-value ; 0.142), educational status (p-value ; 0.466), employment status (0.006), residence status (p-value ; 0.719) with the incidence of anemia in pregnant women in Indonesia based on Riskesdas data in 2018. The results of multivariate analysis showed that there was a significant relationship between malaria infection and the incidence of anemia in pregnant women after controlling for age, nutritional status, and gestational age (PR: 4.065 95%CI (1,310 -12,616). Pregnant women are expected to consume a balanced nutritious diet that is high in protein and iron from both animal (heme) and plant/vegetable (non-heme) sources, conduct ANC visits at least 4 times during pregnancy as an effort early detection of incidents ian anemia and other diseases.

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1. Introduction

WHO data states that throughout 2017 there were 810 cases of maternal death every day, with 86% of them mostly found in Africa and South Asia and several countries with middle to lower middle income with 254,000 cases of maternal deaths that occurred during pregnancy and childbirth (WHO)., 2017).

According to WHO, maternal mortality is mostly caused by bleeding after childbirth or postpartum (WHO, 2018). Research conducted by Satriyandri (2017) states that severe postpartum bleeding is caused by anemia in pregnancy and can increase the risk of 4.8 times for experiencing postpartum hemorrhage compared to mothers who are not anemic (p-value 0.016; OR = 4.846) (Satriyandari and Hariyati, 2017). This opinion is also supported by the WHO statement, that anemia in pregnancy is the 7th cause of maternal death, especially in developing countries as well as contributing to the global burden of disease (WHO, 2011). Anemia in pregnancy is a condition in which pregnant women have hemoglobin levels below normal, which are less than 11 g/dl in the 1st and 3rd trimesters of pregnancy, and in the 2nd trimester with hemoglobin levels of less than 10.5 g/dL (da Costa, 2016). Anemia in pregnancy is also known as potential danger to mother and child or the potential to harm the mother and child (Manuaba, 2011).

Based on WHO criteria, this condition indicates that anemia is a serious public health problem due to its prevalence of 40% worldwide. Based on data from Sirkesnas (Indonesian Health

Indicators Survey) 2016 in the health sector study of the Ministry of Health of the Republic of Indonesia (2019), it shows that almost half of pregnant women in Indonesia are anemic with a percentage of 54.9% (Kemenkes RI, 2019). The 2018 Basic Health Research (Riskesdas) also shows the same thing where the proportion of anemia in pregnant women in Indonesia has increased from 2013 to 48.9% with 84.6% of them occurring in pregnant women aged 15-24. 24 years (Riskesdas, 2018).

In pregnancy, this condition is also exacerbated by the presence of cytoadherence or the attachment of red blood cells infected by Plasmodium that causes malaria in the placental endothelium which causes blockage of blood vessels in the placenta, resulting in obstruction of the distribution of nutrients and oxygen from the mother to the fetus (Prawirohardjo, 2009). Malaria screening carried out by the Indonesian Ministry of Health throughout Indonesia in 2018 found as many as 1,769 pregnant women in Indonesia were identified as positive for malaria, and 1,283 of them were found in Papua Province, which is one of the high malaria endemic areas (Kemenkes RI, 2018).

Therefore, this research is expected to be able to determine the relationship between malaria in pregnant women and the incidence of anemia at the Poriaha Health Center, Tapanuli Regency in the middle of 2020.

2. Method

This type of research uses a cross sectional research design (cross-sectional). The subjects studied were 45 pregnant women. Malaria research data is supported by laboratory examination using a microscope, and anemia incidence data using a hemoque device. Test the relationship using Fisher's exact Test. The research was carried out in August - September 2020 at the Poriaha Health Center, Central Tapanuli Regency, Year2020.

3. Results and Discussion

a. Distribution of Samples by Age

TABLE 1
DISTRIBUTION OF SAMPLES BY AGE

Umur	N	%
20-30	39	86,6
31-40	6	13,3
Total	45	100,0

Table 1 shows that the age group of pregnant women who have the highest number is 20-30 years as much as 86.6%.

TABLE 2
WORK OF PREGNANT WOMEN

Pekerjaan	N	%
IbuRumahtangga	14	31,1
Petani	23	51.1
Swasta	3	6.7
PNS	5	11.1
Total	45	100.0

Based on Table 6, it is known that most of the mothers' occupations are farmers, namely 51.1%. Farmers are more active outside the home, mostly in the morning and returning in the afternoon and this becomes a potential risk of contracting malaria due to contact with malaria mosquitoes, which has the potential for transmission of malaria through the bite of malaria vector mosquitoes to pregnant women (Ministry of Health). RI, 2003).

b. Mother's Education Level

TABLE 3
DISTRIBUTION OF SAMPLES BY MOTHER'S EDUCATION LEVEL

Pendidikan	N	%
Tidaksekolah	6	13,3
SD	11	24,4
SMP	16	35,6
SMA	8	17,8
PT	4	8,9
Total	45	100.0

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Based on Table 7, it is known that the mother's education level is mostly basic education (TS, SD and SMP) of 73.3%. Atmarita and Tatang (2004) stated that the level of education of pregnant women will greatly affect the level of knowledge and behavior of pregnant women in maintaining the health of pregnant women. Higher education can improve health behavior and help prevent disease. A good level of education will affect the behavior of the mother which leads to the prevention of malaria transmission.

TABLE 4
DISTRIBUTION OF SAMPLES BY INCIDENCE OF MALARIA IN PREGNANT WOMEN

KejadianMalaria	N	%
Malaria	25	55,6
Tidakmalaria	20	44,4
Total	45	100,0

Based on Table 8, it is known that at the Poriaha Health Center there are 55.6% of pregnant women affected by malaria and the remaining 44.4% not suffering from malaria. The results of the anamnesis of respondents whether there is a family member suffering from malaria as many as 26 respondents said there was a family member who suffered from malaria. In addition, the high incidence of malaria can be caused by the tropical climate with high temperature and rainfall, which play an important role in the transmission of malaria. Rainwater that causes puddles, is an ideal place for breeding malaria mosquitoes. In addition, rain interspersed with heat will increase the probability of the breeding percentage of Anopheles mosquitoes (Prabowo, 2007). Occurrence of Anemia In determining the presence or absence of anemia, hemoglobin (Hb) levels were measured in 45 pregnant women at the poriaha health center. The results found that the Hb levels of pregnant women varied from 11.5 g% to 16 g%.

TABLE 5
DISTRIBUTION OF ANEMIA KEJADIAN

Kejadian Anemia	N**(%)**	Kejadian
Anemia	3986,67	3986,67
Tidak Anemia	6 13,33	6 13,33
Total	45100,	Total

Based on Table 5, it is known at the Poriaha Health Center, Central Tapanuli Regency that 86.67% of pregnant women are anemic and 13.3% of pregnant women are not. The results from the anamnesis of 22 pregnant women who had malaria before in the last 1 month, and 23 pregnant women took malaria medicine in the last 1 month. This can lead to erythrocyte destruction which can lead to anemia. This is reinforced by the results of research from Handayani, et al (2008). Iron deficiency anemia occurs due to lack of iron reserves in the body. Lack of iron reserves results in disrupted erythropoiesis process, so that the formation of hemoglobin is also disrupted. The emergence of anemia in pregnant women is not only caused by malaria but also because it is influenced by the nutritional status of pregnant women (Limanto, 2010). This is supported by the results of research at the Poriaha Health Center that there are still 70% of pregnant women affected by anemia even though they do not have malaria. The Relationship Between Malaria With The Incidence Of Anemia In Pregnant Women.

TABLE 6
THE RELATIONSHIP BETWEEN MALARIA AND ANEMIA IN PREGNANT WOMEN

KejadianMalaria	Anemia		TidakAnemia		Total	p	RE	CI
	N	%	N	%	N	%		
Malaria	25	100	0	0	25	100		
TidakMalaria	14	70	6	30	20	1000,005*	1,429	1.072-1.903
Total	49		86,7		6	13,3		

Table 6 shows that from 45 samples, 25 (55.55%) pregnant women suffered from malaria and 20 (44.44%) pregnant women did not. Of the 25 pregnant women who suffer from malaria, all of

them are anemic, while from the 20 pregnant women who are not affected by malaria, 14 (70%) suffer from anemia and 6 (30%) do not experience anemia. The results of statistical tests using the Fisher's Exact Test showed p = 0.005 <0.05, which means that there is a significant relationship between malaria and the incidence of anemia in pregnant women. The results of the calculation of the Risk Estimate (RE) obtained an RE of 1,429 which indicates that pregnant women who suffer from malaria have a risk of anemia 1,429 times greater than those who do not. Research conducted by Rosa (2011), proved that parasites in malaria also affect changes in hematology, this can be seen by the symptoms of anemia, namely pale, easy, tired, and the body feels weak. The results of research conducted by Armedy (2010), that Plasmodium falciparum infection causes changes in the shape of erythrocytes that trigger erythrifagocytosis in the spleen, induces an immune response to increase opsonization of phagocytosis through activation of the immune system, which can cause a decrease in hemoglobin levels. Theoretically, the cause of anemia in malaria is the result of a complex interaction between the parasite, the host and the environment. Pathogenesis is more emphasized on the occurrence of increased vascular permeability than intravascular coagulation. Because schizogony causes erythrocyte damage, anemia will occur. The severity of anemia is not proportional to parasitemia indicating the presence of erythrocyte abnormalities other than those containing parasites. This is thought to be due to the presence of malaria toxin which causes impaired function of erythrocytes and some of the erythrocytes break through the spleen so that the parasites come out. Another factor that causes anemia may be the formation of antibodies against erythrocytes (Gandahusada, 2006).

4. Conclusion

The incidence of malaria at the Poriaha Health Center, Central Tapanuli Regency, was 55.6%. The incidence of anemia at the Poriaha Health Center, Central Tapanuli Regency, was 86.7%. There is a relationship between malaria and the incidence of anemia at the Poriaha Health Center, Central Tapanuli Regency (p = 0.005).

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