Jurnal Aisyah : Jurnal Ilmu Kesehatan

Volume 6, Issue 1, March 2021, pp. 69–74
ISSN 2502-4825 (print), ISSN 2502-9495 (online)

Corelation Between Worm Infection and Anemia in Pregnant Women at Sikumana Health Center, Kupang

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ARTICLE INFO

Article history:

Received December11, 2020
Accepted February 20, 2021
Published April 25, 2021

Keyword:

Anemia
Pregnant Women
Worming

ABSTRACT

One of the causes of anemia is worm infection. Data from baseline health research showed an increase in the prevalence of anemia from 2013 by 37.1% to 48.9% in 2018. The research objective was to determine the correlation between deworming and the genesis of anemia on pregnant women at the public health center of Sikumana in Kupang City 2020. This research is analytical in nature and quantitative approach. Cross-sectional research design. The data used are primary data with instruments in the form of questionnaires and sampling in the form of feces and blood for laboratory examination. The data analysis technique was using the Chi-square test using SPSS 20. The results of this research showed that most pregnant women did not have worm infections, 104 respondents and 68 respondents had anemia. The results of the chi-square test found that there was no correlation between worms and anemia on pregnant women as indicated by a p-value of 0.673 <α 0.05. These results are supported by personal hygiene data which shows that most pregnant women have performed personal hygiene properly and correctly, starting from the habit of using a healthy latrine, bathing regularly, washing hands before and after eating, washing feet, using footwear, and diligently cutting nails. as well as cleaning the environment. Therefore, it is expected that there will be further research and health promotion activities to increase knowledge and maintain a clean and healthy lifestyle.

Hubungan Infeksi Cacat dan Anemia pada Perempuan Hamil Di Puskesmas Sikumana Kupang

ABSTRAK

Salah satu penyebab anemia adalah infeksi kecacingan. Data Riskesdas yang dilakukan menunjukan terjadi peningkatan prevalensi anemia dari tahun 2013 sebesar 37,1% menjadi 48,9% ditahun 2018. Penelitian ini bertujuan mengetahui hubungan kecacingan dengan kejadian anemia pada ibu hamil di Puskesmas Sikumana Kota Kupang tahun 2020. Penelitian ini bersifat analitik dengan pendekatan kuantitatif. Desain penelitian *cross sectional.* Data yang digunakan adalah data primer dengan instrumen berupa kuesioner dan pengambilan sampel berupa faeces dan darah untuk dilakukan pemeriksaan laboratorium. Teknik analisa data dengan *uji chisquare* menggunakan SPSS 20. Hasil penelitian ini menunjukan sebagian besar ibu hamil tidak mengalami infeksi kecacingan 104 responden dan sebanyak 68 responden mengalami anemia. Hasil uji chi square ditemukan tidak ada hubungan antara kecacingan dengan kejadian anemia pada ibu hamil yang ditunjukan dengan nilai p value 0.673 < 0.05. Hasil ini didukung dengan data personal hygiene yang menunjukan sebagian besar ibu hamil telah melakukan personal hygiene dengan baik dan benar mulai dari kebiasaan menggunakan jamban yang sehat, mandi teratur, mencuci tangan sebelum dan sesudah makan, mencuci kaki, menggunakan alas kaki, dan rajin memotong kuku serta membersihkan lingkungan. Oleh karena itu, diharapkan adanya penelitian lanjutan dan kegiatan promosi kesehatan

Kata kunci:

Anemia
Ibu Hamil
Kecacingan

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DOI: https://doi.org/10.30604/jika.v6i1.427

untuk meningkatkan pengetahuan dan mempertahankan perilaku hidup bersih dan sehat.

INTRODUCTION

Indonesia is a country that has two climates, namely tropical and subtropical. This climate picture makes Indonesia vulnerable to various infectious diseases such as Upper Respiratory Tract Infection (URTI), diarrhea, deworming and others. Deworming is still a big health problem both in the world and in Indonesia because of its very high prevalence. The World Health Organization (WHO) states that 24% of the world's population has worms. Sub-Saharan Africa, America, China and East Asia have the highest incidence rates. Worms disease in Indonesia has a prevalence of 45% -65% (Pradipta, Puteri P, Nuryanto, 2019).

Deworming infection is often transmitted by worms belonging to the "Soil Transmitted Helminth (STH)" group of worms that are transmitted through the soil. The worms that infest children with a high prevalence are roundworms (Ascaris lumbricoides), whipworms (Trichuris trichiura), hookworms (Necator americanus), Ancylostoma duodenale (Organization, 2011). Deworming infections are often recognized in densely populated environments, poor sanitation, dirty environments and areas with tropical and humid climates.

Deworming infection contributes to the genesis of malnutrition and anemia. The results of a research in Brazil that intestinal parasites such as Ascaris lumbricoides, Trichuris trichiura and hookworm were associated with iron deficiency anemia. Research in Manado states that children infected with worms have abnormal hemoglobin levels (Basalamah, MF., 2013)

The results of a literature study on Soil Transmitted Helminth Infections and its Association with Hemoglobin Levels in India: A Meta-analysis states that out of 16 publications consisting of six case reports and ten cross-sectional studies that report data on deworming infection and hemoglobin levels show odd analysis results. the ratio of the five cross-sectional reports was that Helminth infection was three times (OR-2.8, 95% CI, 2.4–3.4) more likely to occur at lower hemoglobin levels than in the uninfected population. Case report analysis showed severe to moderate anemia in all patients (Salam & Fareed, 2019).

Deworming infection is also an important cause of maternal death and illness. WHO data show that about 10% of live births experience bleeding complications after delivery. The most common complication is anemia. If a mother with anemia becomes pregnant, it can aggravate her anemia and be fatal. Various programs for overcoming anemia have been launched by the Indonesian government, one of which is through the movement for the first thousand days of life by giving 90 iron tablets to mothers during their pregnancy.

Basic Health Research conducted by the Indonesian government reported that there was an increase in the prevalence of anemia from 2013 of 37.1% to 48.9% in 2018 (Research and Development Agency for Health, Ministry of Health of the Republic of Indonesia, 2018). WHO (2012) states that anemia in pregnancy is one of the factors that support the occurrence of 40% of maternal deaths in developing countries. The prevalence of pregnant women who experience anemia in Indonesia is quite high (63.5%) when compared to the United States which is only 6%. The prevalence data for pregnant women with anemia were mostly found in the age range 15-24 years (84.6%), 25-34 years (33.7%), and 35-44 years (33.6%). 45-54 years (24%). Most anemia in pregnancy is caused by iron deficiency and acute bleeding, not infrequently, the two interact (Saifudin, 2012).

Pregnant women are included in the group that is susceptible to infection from various microorganisms. Physiologically, the immune system in pregnant women decreases. The results showed that worm infections in North Bolaang Mongondow Regency were associated with TNF in pregnant women (Yanto, 2015). The results of previous studies indicate that most pregnant women who suffer from anemia are positive for worms. If this is not treated, it will lead to more severe complications and even death. The 2013 survey data shows the prevalence of worms between 0 - 85.9% (survey in 175 districts / cities) The average prevalence is 28.12% (Kupang City Health Office, 2017).

From the results of the preliminary survey at the public health center of Sikumana, it is known that the number of pregnant women in 2019 was 1510 people and the number of pregnant women suffering from anemia was 969 people (64.17%). In addition, there has never been any research that examines the relationship between worms and anemia in pregnant women at the public health center of Sikumana.

METHOD

This research is analytic with a quantitative approach. The research design used was cross sectional. This research was conducted at the public health center of Sikumana on July-September 2020. The population in this research were 1510 pregnant women at the public health center of Sikumana. The sample size was calculated using the proportion estimation formula (Notoatmodjo 2012).

$$n = \frac{Z^2 p\,(1-p)}{d^2}$$

n = number of samples

p = proportion of anemia in pregnant women in 2019, namely 64.17% (0.6417)

d = degree of deviation from the desired population (0.10)

$$n = \frac{1.96^2\ \ 0{,}6417\ (1-0.6417)}{0{,}10^2}$$

$$n = 88{,}22$$

Based on the calculation of the sample size above, with a confidence degree of 95%, a precision value of 25%, the minimum sample size is 88 people plus 25% so that it becomes 110 people.

The sampling technique used in this research was purposive sampling, which is a technique that is done by taking

samples who come to the public health center and meet the inclusion criteria. The inclusion criteria in this research were pregnant women who were in the working area of the public health center of Sikumana r in Kupang City in 2020, were willing to become respondents and returned the pot of feces to the researcher.

The instrument used in this research was a questionnaire and a sample of respondents in the form of faeces and blood was used to then check for worms and hemoglobin levels at the public health center of Sikumana by laboratory staff.

At the time of data collection, researchers conducted direct interviews using a closed questionnaire. The questions contained in the questionnaire are to ask the respondent for approval as well as complete identity, respondent characteristic data and personal hygiene.

Respondents who have received explanations and are willing to become respondents (informed consent) and have completed the questionnaire are then given faeces bottles, then directed to the laboratory. Blood samples were collected after the interview, while stool samples were collected a day or two after the interview. Anemia examination was carried out using the Sahli method, while the examination for worms used the Harada Mori method and continued with the floating method.

The data analysis technique used the univariate test, the bivariate test used the chi square test with the SPSS version 20 application. Data presentation was narrative and tabular (Natael, 2013). This research has received the approval of the code of ethics from the Health Research Ethics Commission of the Faculty of Medicine, University of Nusa Cendana Number: 79 / UN15.16 / KEPK / 2020.

RESULTS AND DISCUSSION

Based on Table 1 above, it is known that the results of laboratory examinations showed that most pregnant women did not have worms (104 respondents) and 68 pregnant women had anemia (68 respondents). Most of the pregnant women aged ≥ 20 years were 101 respondents, 59 respondents had high education, and most of the pregnant women had practiced personal hygiene (105 respondents), and only 18 respondents had not received information about anemia and worm disease in pregnant women.

Table 1
The Result of Univariate Analysis (N=110)

VARIABLES	F	Percentage %
Deworming		
Positve Deworming	6	5.5
Negative Deworming	104	94.5
Anemia		
Anemia (< 11 gr%)	68	61.8
Not Anemia (≥ 11 gr%)	42	38.2
KARAKTERISTIK RESPONDEN		
Age		
< 20 year	9	8.2
≥ 20 year	101	91.8
Education		
Low	51	46.4
High	59	53.6
Personal Hygiene		
Do not	5	4.5
Do	105	95.5
Information		
Do not get information	18	16.4
Get information	92	83.6

One of the causes of nutritional anemia is chronic blood loss due to worm infestations. This is common in tropical and humid countries with poor sanitary conditions. Deworming infection occurs transmitted through food and drink or skin that has been contaminated with worm eggs (roundworms (Ascaris lumbricoides), whipworms (Trichuris trichuria) and hookworms (Ancyclostoma duodenale and Necator americanus)) where the soil is the transmission medium. Worms that stay in the human intestine if left untreated can cause chronic bleeding which results in decreased iron reserves in the body and ultimately can lead to iron deficiency anemia.

Infections of various microorganisms. Physiologically, the immune system in pregnant women decreases. The results showed that there was a worm infection in Bolaang Mongondow Utara Regency associated with TNF α in pregnant women (Yanto, 2015). The results of previous studies indicate that most pregnant women who suffer from anemia are positive for worms. If this is not done properly, it will lead to more severe complications and even death.

One of the causes of anemia in pregnant women is infection with Soil Transmitted Helminth (STH) where pregnant women who are infected with STH are three times more likely to experience anemia than pregnant women who are not anemic. In cases of severe infection, hemoglobin levels can drop to low levels that can threaten the life of pregnant women (Salam & Fareed, 2019). Research in Brazil shows intestinal parasites such as Ascaris lumbricoides, Trichuris trichiura and hookworms are associated with iron deficiency anemia. Research in Manado states that children infected with worms have abnormal hemoglobin levels (Basalamah, MF., 2013).

The results of this research showed that most of the pregnant women did not have worm infections and there was no correlation between worms and the genesis of anemia on pregnant women as indicated by a p value of 0.673 <α 0.05. These results are supported by personal

hygiene data which shows that most pregnant women have performed personal hygiene properly and correctly, starting from the habit of using a healthy latrine, bathing regularly, washing hands before and after eating, washing feet, using footwear, and diligently cutting nail as well as cleaning the environment.

The results of research conducted by Sapada & Asmalinda, (2020) show that the supporting factors for the transmission of worms are the habit of washing hands before eating, the habit of cutting nails, the habit of using the latrine and the habit of using footwear while working.

Table 2
The Result of Bivariate Analysis (N=110)

Variables	Anemia				Total		*P Value*
	Anemia		Tidak Anemia				
	N	%	N	%	N	%	
Deworming							
Positve Deworming	3	50.0	3	50.0	6	100	0.673
Negative Deworming	65	62.5	39	37.5	104	100	
Age							
< 20 year	7	77.8	2	22.2	9	100	0.478
≥ 20 year	61	60.4	40	39.6	101	100	
Education							
Low	37	72.5	14	27.5	51	100	0.031
High	31	52.5	28	47.5	59	100	
Personal Hygiene							
Do not	4	80	1	20	5	100	0.647
Do	64	61	41	39	105	100	
Informasi							
Do not get information	15	83.3	3	16.7	18	100	0.040
Get information	53	57.6	39	42.4	92	100	

The results of this research are in line with the results of research by Yanto, A., Damajanty HCP and Joice NAE, 2015 which states that the chi square test with a 95% confidence level shows that there is no correlation between worm infection and hemoglobin levels on pregnant women in Bolaang Mongondow Utara Regency with a p value. value 0.144.

This is the same as a research conducted by (Helfiyan, 2006) which showed that there was no significant correlation between Ascaris lumbricoides infection and anemia (p-value = 0.36 OR = 2.43), Trichiuris trichiura infection with anemia had no significant correlation with a value of p = 0.30, infection with 2 types of worms namely Ascaris lumbricoides and Trichiuris trichiura with anemia had no significant correlation with a value of p = 0.08 OR = 4.87, and infection of Ascaris lumbricoides and Necator americanus with anemia was not found significant correlation p-value = 0.30.

The risk factors associated with worm infection prevalent among pregnant women attending the antenatal clinic at Kilifi Hospital suggest that a mass deworming strategy must be implemented. In addition, health education such as preventing pregnant women from geophagy, fetching water from wells, encouraging water treatment, washing hands before eating and after visiting the toilet, taking deworming medicine regularly every three months, and wearing shoes while at home (Njeru, A, and Francis M, 2019). Overall, deworming on pregnancy can cause a high risk of anemia, but may not increase the risk of LBW and worms in pregnancy can be separated from unhealthy habits such as geophagy (Boye et al., 2014).

The high prevalence of ascariasis is caused by poor personal hygiene and low economic status. Deworming eggs are known to stick to dust, fruits, and vegetables which, if personal hygiene is lacking, pregnant women can accidentally become infected when eating contaminated food. Pregnant women in many rural areas rely on latrines for waste disposal without facilities to wash their hands after defecating. This habit, if accompanied by seasonal flooding and the possibility of latrines overflowing, causes human waste to enter drinking water sources and gardens, so it is likely to cause a high prevalence of ascariasis. Hand washing, a higher level of education, and the availability of water facilities and modern toilets play a significant role in the prevention and control of deworming disease (Wekesa et al., 2014)

Another supporting research is research conducted by T.O. Alade, et al in South Ilorin showed that 70% of the South Ilorin government area had deworming infections. This is higher than some other tropical regions, which is recorded at 26.0%. Anemia that occurs in Ilorin Selatan is statistically associated with intestinal helminthic worms, hookworms, T. Trichuira worms and A. lumbricoides worms. This is of particular concern to health workers to educate the public about personal hygiene so as to reduce the prevalence of anemia (Alade, 2017).

Soil-borne worms in pregnancy are associated with the incidence of anemia in pregnancy. Systematic screening for risk factors for anemia in pregnancy needs to be addressed. General deworming treatment in pregnant women after the first trimester should be provided and practically applied in developing countries (Shrinivas et al., 2014). Gestational treatment with albendazole has a cure rate of up to 90% for hookworm and ascariasis, but only 50% for Tricuris worms while gestational treatment with mebendazole has an overall cure rate of ≤ 70% for Ascaris, hookworm and Trichuris. Treatment of worms in pregnant women needs to be done considering the huge dangers they cause (Lau et al., 2020).

Preventing anemia on pregnant women, intervention should be carried out since women are still teenagers because young women are a group that is at risk of developing anemia. Adolescent girls who are anemic and have poor nutritional status will have a bad contribution if

they experience pregnancy both at adolescence and as an adult which can result in the birth of a baby with LBW, morbidity and even death. It is hoped that the provision of education to young women can increase the knowledge of young women about nutrition, especially about anemia, and is expected to change their eating habits so that nutrition intake is better. The research conducted proves that nutrition education provided by the question and answer lecture method with the help of booklets has the potential to increase the knowledge of young women about anemia (Silalahio, Verarica, Evawany Aritonang, 2016). Women who are pregnant should undergo laboratory tests to detect anemia at the first antenatal visit and receive advice on how to ensure iron intake and improve a diet containing iron (Hasswane et al., 2015). In addition, the role of the husband in accompanying his wife who experiences anemia during pregnancy is still lacking due to a lack of knowledge about anemia, the causes of anemia and the dangers of anemia in pregnancy (Fernandes et al., 2017). Anemia is a health problem with a high prevalence in pregnant women. Anemic conditions experienced by pregnant women are a factor in the occurrence of bleeding, prolonged labor, abortion and infection which are the main causes of maternal death. During the labor process, mothers with anemia also improve delivery assistance by taking measures. The research conducted showed that there was a relationship between the incidence of anemia and delivery of cesarean section in mothers who gave birth at the Islamic Hospital of YAKSSI Gemolong Sragen with a contingency coefficient (CC) value of 0.432, which means the level of closeness of the relationship between anemia and the genesis of sectio caesarean surgery strong enough (Muliawati, Isti, Mahalul Azam, 2011)

Anemia can be defined as a state of low iron in the blood, usually measured by hemoglobin levels. In pregnancy there is a decrease in hemoglobin caused by hemodilution, when the total volume of blood plasma increases, the number of erythrocytes per unit in the blood decreases. Hemoglobin levels vary during pregnancy where in the first and second trimesters there is a decrease and increase or decrease again during the third trimester. According to the World Health Organization (WHO) the normal hemoglobin concentration is 11 g / dL to 12 g / dL for nonpregnant women.

Anemia is one of the most common side effects of earthworm infection where this condition will result in blood loss in the intestines or in the urinary tract. Hookworm, in particular, has been associated with a significant reduction in hemoglobin levels during pregnancy. Worms infection is associated with mild iron deficiency, but generally only if the parasite load is high. However, there is little evidence to suggest a synergistic effect between intestinal worms and pregnancy is similar to that observed in non-pregnant women. In addition, worm infection is rarely associated with severe anemia in the absence of other driving factors, such as nutritional deficiencies or co-infection with malaria or HIV. If there is a nutritional deficiency, worms, and especially hookworm, can exacerbate iron deficiency.

Although the results of this research indicated that there was no correlation between deworming and anemia, from the results of the chi square test, the characteristics of the respondents, it was known that there was a significant correlation between educational variables (p value 0.031 <0.05) and information variables (p value 0.040 <0, 05) with the genesis of anemia on pregnant women and there is no significant correlation between the variable maternal age (p value 0.917 <0.05) with the genesis of anemia on pregnant women and there is no significant correlation between personal hygiene variables and the genesis of anemia on pregnant women (p value 0.647 <0.05)

Mother's education greatly affects a person's ability to receive information. The higher a person's education level, the easier it is to live a healthy, independent, creative and sustainable life. Information from midwives through anemia counseling conducted in the class of pregnant women and health education can prevent anemia, therefore pregnant women are expected to be able to choose foods that contain lots of iron (Prahesti, Ratna et al., 2016).

The same thing was stated by Stephen et al in North Tanzania where it is known that the prevalence of pregnant women who have anemia is 18% (95 people with 40 mild anemia, 43 people with moderate anemia and 12 people with severe anemia) with risk factors that cause anemia is the residence and education level of pregnant women (Stephen et al., 2018). In addition, research conducted by Mira Trihartini shows that there is a correlation between health promotion models and anemia prevention behavior and hemoglobin levels with p-value 0.013 and p value 0.040 respectively, which means that health workers can use the Health Promotion Model and Self Determination Theory Based Intervention. to improve anemia prevention behavior (Triharini et al., 2019).

CONCLUSION

Based on the results of the research above, there can be no correlation between deworming and anemia on pregnant women at the Public Health Center Sikumana, Kupang City in 2020. This is because all pregnant women have carried out personal hygiene properly and correctly. The results of further analysis of the characteristics of the respondents show that there is a significant correlation between education and information from health workers, families and the mass media with the genesis of anemia on pregnant women. For this reason, further research is needed to identify other factors that influence the genesis of anemia on pregnant women. In addition, health workers are expected to continue to improve health promotion in the form of counseling in order to increase public awareness and sensitivity to prevent anemia as well as improve personal hygiene to prevent deworming infection, considering that the impact of worm infection on pregnant women is very large.

Conflicting of Interests Statement

The authors declared that no potential conflicts of interests with respect to the authorship and publication of this article.

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