

RELATIONSHIP OF NUTRITIONAL ANEMIA WITH THE EVENT OF WORM INFECTION IN PRIMARY SCHOOL CHILDREN IN THE WORK AREA OF AIR BILITI PUSKESMAS MUSI RAWAS

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ABSTRACT

More than 1.5 billion people or 24% of the world's population experience worm infections that are transmitted through the soil. Worm infections that occur can damage the nutritional status in the form of anemia in all children, especially school age. The purpose of this study was to determine the relationship between nutritional anemia and the incidence of helminthiasis. This research method is an analytical observational with a cross-sectional design. The population in the study was conducted on elementary school children in the working area of the Air Biliti Health Center, Musi Rawas Regency in 2021. The sample in this study was 98 with simple random sampling at five schools in the working area of the Air Biliti Health Center. The study was conducted in March 2021. The results of this study showed that most of the proportions of negative helminth infections were 60 (61.2%), not anemic 71 (72.4%), Class VI 39 (39.8%), 11 years old 32 (32.7 %), female 50 (51.0%), high parental education 53 (54.1%), farmer occupation 61 (62.2%), income 50 (51.0%). The results of the analysis of the significant relationship between nutritional anemia (p value 0.000, OR = 6.500) and infection rates in elementary school-aged children in the work area of Air Biliti Health Center, Musi Rawas Regency. Based on the results of the study, it was found that the importance of maintaining environmental cleanliness and personal hygiene, coupled with the habit of taking a worm medicine and attention from parents to reduce helminth infections that cause children to experience nutritional anemia.

Keywords: Nutritional Anemia, Worm Infection

INTRODUCTION

Worm infection transmitted through soil or called Soil-transmitted helminth infection (SHT) of intestinal worms that are transmitted through the ground to humans contaminated with media transmission caused by roundworms (*Ascoris lubricoides*), whipworm (*Trichuris trichura*), and hookworm (*Ancylostoma duodenale*, *Necator americanus*) (CDC, 2020). According to the data of the World Health Organization (WHO) over 1,5 billion people, or 24% of the world population experienced

worm infection. Over 267 million children of preschool and over 568 million school-age children living in areas where the parasite is transmitted intensively, so in need of treatment and prevention interventions more. Worm infection transmitted through the ground can damage the nutritional status, worms that enter the intestine takes to host tissues, including blood resulting in the loss of iron and protein in the body, so the risk of the anemia, diarrhea and dysentery. The worm infection also causes a reduced appetite (WHO, 2020).

In Indonesia, helminth infections are still high, especially in the poor population, with poor sanitation between 2.5%-62% (Ministry of Health, 2017). Worm infections can affect everyone, but school-age children are most at risk of being infected with worms (Sigalingging *et al.*, 2019). More than 60% of elementary school children in Indonesia experience worm infections, not only nutritional disorders, but also poor sanitation, especially contaminated water, drinks and food that are not cooked until cooked and not covered (Pasyanti *et al.*, 2015). Riskesdas data (2018) the prevalence of anemia nationally at the age of 5-14 years is 26.8% (Ministry of Health RI, 2018). Health problems experienced by elementary school/madrasa children include nutritional problems (thin or fat and anemia. South Sumatra, based on the health screening of class 1 participants by Province (2018), 78.92% of them experienced nutritional problems such as anemia (Ministry of Health, 2018).

Anemia is a condition in which a low concentration of hemoglobin (Hb) or hematocrit based on a threshold value is caused by low production of red blood cells and Hb, increased erythrocyte damage or excessive blood loss (Citrakesumasari, 2012). Research conducted by Rajagopal *et al.* (2014) showed that the infection of worms and anemia have relationship with roundworms (*A. Lubricoides*), whipworm (*T. trichiura*) or hookworm (*N. Americanus* or *A. duodenale*). Those research have subjects aged 2-15 years in which anemia is caused by three worms which are found mainly hookworm.

This worm disease can lead to a decrease in the health condition, nutritional status, intelligence and productivity of the sufferer so that economically it causes a lot of losses. Worms cause loss of intake of carbohydrates and protein and blood loss, so it will decrease the quality of human resources (Pemenkes, 2017). Helminthiasis have signs perceived as pain in the abdomen appear repeatedly, decreased appetite, anemia, as well as feeling itching in the anus (South Sumatra Provincial Health Office, 2020). Worm disease that occurs in children aged Elementary School can disturb the concentration of learning, not focus, weakness, fatigue, and drowsiness while studying (Sarasmita, 2020).

Worm infections that occur are caused by intestinal parasites that trigger food intolerance secondary to irritation of the intestines (Gozalbo *et al.*, 2020). Research conducted (Annisa *et al.*, 2018) found a significant relationship between nutritional status and the incidence of helminth infections in schools. Worm infection also can affect children's nutritional status age of school because of less consumption in balanced eating (Hardinsyah, 2017). Worm diseases that occur in elementary school age children can have a chronic impact on the nutritional status of children infected with worms (Kamila *et al.*, 2018).

Research (Aji *et al.*, 2017) that there is a relationship between Soil Transmitted Helminth (STH) infection and anemia in elementary school children. Results (Molla & Mamo, 2018) of 443 sample school children, 54% were infected with soil-transmitted worms (STH) and 15.4% of them suffered from anemia. According to research

(Puspita *et al.*, 2020) that there is a relationship between the incidence of worm infection with anemia in elementary school children $p = 0.017$, this is influenced by high knowledge, clean and healthy living behavior, provided hand washing facilities at school and at home, and active role of parents.

Based on the description above, this study aims to analyze the relationship between nutritional anemia in elementary school age children in the working area of Air Biliti Health Center, Musi Rawas Regency, in the Air Beliti Health Center working area there are no reports of anemia incidence and reports of primary school children infected with helminthiasis.

METHODS

This research is a quantitative research with a cross-sectional research design. Research was conducted in Puskesmas Air Biliti Musi Rawas, in March 2021. Based on the calculation of the samples using a sample size of two proportions formula resulted of 98 subjects. The subjects taken were 98 people using random sampling technique. The inclusion criteria were elementary school students in grades 3, 4, 5 and 6 in the working area of the Air Biliti Health Center, willing to have their blood and feces drawn and not taking worm medicine in the last 6 months. The exclusion criteria were when the subject did not return the stool bottle and the subject suffered from diarrhea/dysentery, and did not want to have blood drawn. Each selected subject received parental consent by filling in informed consent as a sign that the subject agreed to participate in the study. Hb test was done by

using a strip of diagnostic rapid test. Univariate and bivariate analysis using Chi Square test.

RESULTS AND DISCUSSION

The subjects in this study came from 5 elementary schools in the working area of the Air Biliti Health Center, Ten Musi Rawas Regency. A total of 98 subjects were involved until the end of the study.

Based on Table 1. It shows that most of the proportions of the incidence of negative helminth infections are 60 (61.2 %), not anemic 71 (72.4%), Class V I 39 (39.8 %), 11 years old 32 (32.7 %), female sex 50 (51.0%) , high parental education 53 (54.1%), farmer occupation 61 (62.2 %), low income 50 (51.0%).

Based on Table 2, the results of statistical tests showed that subjects with worm infection experienced nutritional anemia 19 (10.5 %) compared to subjects who did not experience nutritional anemia, namely 19 (27.5 %) experienced helminth infection . The results of the analysis obtained relationship anemia with ang ka incidence of worm infection (pv alue 0.0000) with OR 6 , 5 00 that experienced anemia risk 6 .5 times more risk in worm infected compared to non-anemic nutrition.

Based on the results of this study, most of the proportions of negative helminth infections were 60 (61.2%), not anemic 71 (72.4%), Class VI 39 (39.8%), 11 years old 32 (32.7%) , female gender 50 (51.0%), high parental education 53 (54.1%), farmer occupation 61 (62.2%), low income 50 (51.0%). The results of the analysis showed that there was a significant relationship between nutritional anemia (p value 0.000, OR = 6.5 00) and the rate of worm infection in elementary school- aged (SD) children in the working area of Air Biliti Health Center, Musi Rawas Regency.

In the research results obtained results worm infection was positive in 38 (38 , 8 %)

and anemia 27 (27.6%) this is because the hygiene of individuals as well as high consumption of foods that have iron content results in high . Worm infection is a disease that is transmitted through food and drink or through the skin where soil is the transmission medium, caused by roundworms (*A. lumbricoides*), whipworms (*T. trichuria*), and hookworms (*A. duodenale* and *N. americanus*) (Sigalingging). et al., 2019) . The worms can affect the digestion and lead to lack of nutrients such as calories, protein and nutrients iron, so menghambat perkemb a n gan physical, experiencing anemia, intelligence decline and labor productivity (Midwives, 2010) . The large number of worms can cause malnutrition in children, because these worms can live in the body of children for 12-18 years, and take food, especially carbohydrates 0.14 grams, protein 0.035 grams, suck blood 0.03-0.05 ml per day. days (Purnasari, 2018) . Worms can interfere with learning concentration, not focus, weak, easily tired, and easily sleepy (Sarasmita, 2020) According to research (Sanchez, et al 2013) the overall prevalence of STH is 72.5% with a p value of 0.001 there is a relationship between helminth infections and nutritional status child.

Anemia is a condition in which hemoglobin and hematocrit levels are lower than normal levels. Anemia is strongly related to school children's learning achievement (Sudargo , 2015) Research is in line with research conducted (Pratiwi & Sofiana, 2019) that most of the female gender who experience positive anemia are 15 (18.50%), from the results of the analysis there is no relationship There is a significant relationship between worm infection and anemia, but helminthiasis is a risk factor for anemia.

Research conducted (Kamila et al., 2018) that most of the worms found during the study were *T. trichiura* worms (65.4%),

these worms cause nutritional disorders and anemia in children aged 1-15 years, with a prevalence of anemia that occurred (71.2%). This study is in line with research conducted by Getnet (2015) that the results of the study found a significant relationship between anemia and hookworm infection ($p = 0.000$), infections that occur are influenced by poor sanitation conditions and low personal hygiene.

This study is in line with research (Yimam et al., 2016) that there are research results of 15.4% suffering from anemia, and 58.3% are basically infected with intestinal worms , in the study there was a decrease in helminth infections in school-age children after being given deworming medicine, so that the administration of deworming medicine is related to the hemoglobin level in school-age children who have worm infections and suffer from anemia. This study supports previous research that the importance of maintaining sanitation, as well as personal hygiene and then regularly taking worm medicine so as to reduce the incidence of helminth infections that can cause anemia.

CONCLUSION

Based on the results of the pen elitian that it can be concluded that based on the results of the analysis are significant relationship anatara anemia (p value = 0.000, OR = 6.500) with the numbers worm infection in children aged Elementary School (SD) with children infected with anemia risk 6 , 5 times the infected kecacinagn in the working area of the Air Biliti Health Center , Musi Rawas Regency.

SUGGESTION

Based on the results obtained that suggested to respondents infected with intestinal worms to regularly take medicines, always keeping environmental sanitation as well as personal hygiene and lack of attention from parents to their children's health so as to

reduce the risk of infection by intestinal worms in children of school age resulting in anemia nutrition .

Table 1. Frequency Distribution of Subjects and Parents Characteristics in the working area of Air Biliti Health Center

No	Variable	N	%
1.	Worm Infection Incidence Rate		
	a. positive	38	38.8
	b. Negative	60	61.2
2.	Anemia		
	a. Yes	27	27.6
	b. Not	71	72.4
3.	Class		
	a. Class III	2	2.0
	b. Class IV	32	32.7
	c. Class V	25	25.5
	d. Class VI	39	39.8
4.	Gender		
	a. Man	48	49.0
	b. Woman	50	51.0
5.	Parental Education		
	a. No school	1	9
	b. Not completed in primary school	15	13.9
	c. Elementary School	25	23.1
	d. Graduated from junior high school/junior high school	29	26.9
	e. Finished high school / high school	26	24.1
	f. Graduated PT	12	11.1
6.	Age		
	a. 7 years	2	2.0
	b. 8 years	1	1.0
	c. 9 years	12	12.2
	d. 10 years	22	22.4
	e. 11 years old	32	32.7
	f. 12 years old	26	26.5
	g. 13 years old	2	2.0
	h. 14 years	1	1.0
7.	People Education		
	a. Low	45	45.9
	b. Tall	53	54.1
8.	Parents' job		
	a. Non Farmer	37	37.8
	b. Farmer	61	62.2
9.	Parent's Income		
	a. Low	50	51.0
	b. High	48	49.0

Table 2. Nutritional anemia with the incidence of helminthiasis in elementary school children

<i>Nutritional Anemia</i>	The incidence of helminth infections				Total		<i>P</i>	OR96% CI (Min-Max)
	Positive		Negative		N	%		
	N	%	n	%				
Yes	19	10.5	8	16.5	27	100.0	0.000	6,500 (2,442-17,301)
Not	19	27.5	52	43.5	52	100.0		
	38	38.0	60	60.0	98	100.0		

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