DIFFERENCES IN EXAMINATION OF USUS NEMATODE EGGS ON FESES BETWEEN FLOTATION METHODS AND SEDIMENTATION METHODS FOR STUDENTS AT SDN 11 TELAGA

Dian Putri Muhrija[1)], Agusrianto Yusuf[2)], and Natan Pasiga[3)]
[1,2,3)] *Bina Mandiri University Gorontalo*
E-mail: dianmhrja23@gmail.com

ABSTRACT

Various types of intestinal worms are still a public health problem and are often found both in cities and in villages in Indonesia, which can lead to anemia, malnutrition, impaired growth and impaired intelligence. This also leads to choosing the right method to determine a person's worm status. The use of a fecal examination method that has a high level of sensitivity and specificity is very important in order to obtain a worm status or accurate results. A person's worms status can be ascertained by finding worm eggs in a fecal laboratory examination. This study aims to determine differences in the results of examining intestinal nematode eggs in feces between Flotation methods and sedimentation methods for students at SDN 11 Telaga.

This research is a quantitative analytic comparative method, with a sample size of 35 people from a population of 54 people. The data analysis used is univariate analysis and bivariate analysis.

The results were tested with Wilcoxon. The results of this study showed that the flotation method was positive, and in the sedimentation method there were no intestinal nematode eggs.

Keywords : Feces, Intestinal Nematodes, Flotation Method, Sedimentation Method.

INTRODUCTION

Intestinal worm infection is a public health problem in developing countries including Indonesia, especially in rural areas or urban areas which are dense and slum. Worms are widespread in the tropics and subtropics, but are often found in warm and humid climates, worms are the most common infectious disease affecting all ages [5].

Lmore than 1.5 billion people or 24% of the world's population are infected with Soil Transmitted Helmint with the third largest number of children aged 1-14 years in the world after India and Nigeria, which is around 7%. Indonesia has a fairly high worm infection rate as much as 28% of Indonesian children are infected worms [15]. There are three main causes of the high number of worms, namely hookworms, rings and whips. Guidelines regarding worm disease control, namely the Minister of Health Decree No. 424/2006 states that controlling worms is prioritized for children under five and school age [1].

Gorontalo Province is an area with a tropical climate which makes it easier for the growth of worm eggs that cause infection in humans, based on data obtained by Gorontalo Province in 2018 [3].Elementary school age children are a group that is at risk of being infected with worms. Soil is a source of infection where primary school children are often in direct contact. Defecation in the yard or in the

Submit: Feb 2nd, 2021 Accepted: Feb 15th, 2021 Published: March 29th, 2021

drain can cause the soil to become contaminated with worm eggs [14].

The use of a fecal examination method that has a high level of sensitivity and specificity is very important in order to obtain a worm status or accurate results. A person's worms status can be ascertained by finding worm eggs in a fecal laboratory examination. Stool examination consists of microscopic and macroscopic examination. Microscopic examination consists of two examinations, namely qualitative and quantitative examinations. Qualitative examination can be carried out in various ways, such as direct slide examination which is a routine check carried out, the flotation / flotation method, the tape method, the thick preparation technique and the sedimentation method. Quantitative examination is known by several methods, namely the Stoll method, Quantitative flotation and the Kato-Katz method [11].

One of the primary schools in Gorontalo district is SD Negeri 11 Telaga, Telaga Subdistrict, Gorontalo Regency is a school located in a rural area, namely Dulamayo Selatan Village. In addition, based on observations that have been made there are still habits that do not pay attention to personal hygiene such as playing on the ground, some students do not use footwear and nails. uncut nails and the habit of not washing hands before eating and after playing on the ground. So that with this condition it can be a risk factor for the occurrence of worms in children

The fecal laboratory examination to find parasite eggs plays an important role in determining the worm status of a person. The sedimentation method (sedimentation method) is one of the fecal examination methods commonly used in Indonesia. The sedimentation method (method of deposition) is a method of using a solution with a lower specific gravity than the parasitic organism and utilizing centrifugal force, so that the parasites can settle to the bottom. The sedimentation method that is often used based on reagents is the sedimentation method with NaOH. This method can also be used to determine whether a person is positive or negative for worms. The advantages of this method are that it can be used for mild and severe infections and the eggs can be seen clearly,

The flotation method itself is a method based on specific gravity, so that the eggs will float and are easily observed. This method itself is used to examine feces that contain a small amount of eggs, the way this method works is based on the specific gravity of the solution used, so that the eggs float on the surface and also to separate large particles in the feces. The flotation method commonly used for qualitative examination has good effectiveness for examining low-grade infections and the resulting preparations are cleaner but this flotation method takes a long time to examine and is only successful for nematode eggs and egg types from the family Taenidae [12].

Based on the above problem, the researcher was interested in conducting a study with the title Difference in the results of examining intestinal nematode eggs in feces between the flotation method and sedimentation method in elementary school students at SDN 11 Telaga.

RESEARCH METHODS

This type of research uses the comparative analytical quantitative research method. The comparative method is a comparative research conducted to compare the similarities and differences between two or more properties and facts of the object under study based on a certain frame of mind. Comparative research is usually used to compare between two group or more in a certain variable [13].

Location Sampling was conducted at SDN 11 Telaga, Dulamayo Selatan Village, Telaga District, Gorontalo Regency. The location of the sample examination was conducted at the Microbiology Laboratory of the Faculty of Science Technology and Health Sciences, Bina Mandiri University Gorontalo.

The time of this research was carried out on October 22 to October 26, 2020.
The sampling technique used in this study is the simple random sampling method, which is a technique of taking samples from members of the population which is done randomly without paying attention to the levels in the collection [13].

This research data analysis is univariate and bivariate.

Univariate analysis is an analysis carried out for one variable or pervariable independently, each variable is analyzed without being associated with other variables in order to identify and identify the characteristics of these variables [2].

Bivariate analysis is a type of analysis used to determine the relationship between two variables, where the two variables are the main variable or independent variable and the dependent variable. In this analysis, the Mcnemar test is used for the case of two paired samples. examination of intestinal nematode eggs flotation method and sedimentation method on faecal samples [2].

RESEARCH RESULT

The following data is data that shows the results of examining intestinal nematode eggs in feces between the flotation method and the sedimentation method for students at SDN 11 Telaga.

Table 1. Results of examination of intestinal nematode eggs in feces between the flotation method and sedimentation method for students at SDN 11 Telaga.

No.	Sample Code	Examination Method	
		Flotation	Sedimentation
1	S1	+	-
2	S2	+	-
3	S3	-	-
4	S4	-	-
5	S5	+	-
6	S6	-	-
7	S7	+	-
8	S8	-	-
9	S9	+	-
10	S10	-	-
11	S11	+	-
12	S12	-	-
13	S13	-	-
14	S14	-	-
15	S15	+	-
16	S16	-	-
17	S17	+	-
18	S18	-	-
19	S19	+	-
20	S20	+	-
21	S21	+	-
22	S22	-	-
23	S23	+	-
24	S24	+	-
25	S25	-	-
26	S26	+	-
27	S27	+	-
28	S28	+	-
29	S29	+	-
30	S30	-	-
31	S31	+	-
32	S32	-	-
33	S33	+	-
34	S34	-	-
35	S35	-	-

Source: Primary data 2020

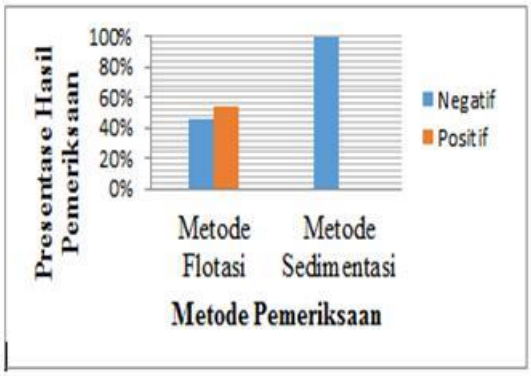
Based on table 1. above, it shows that examination of intestinal nematode eggs in the feces of elementary school students is 35 respondents. Examination of intestinal nematode eggs in the feces of elementary school students using the flotation method obtained 19 positive samples and 16 negative samples. Examination of intestinal nematode eggs in the feces of elementary school students using the sedimentation method 35 negative samples.

Table 2. *Results of Examination of Intestinal Nematode Eggs in Feces Between Flotation Method and Sedimentation Method.*

Result	Sedimentation Method Examination Results				amount		p-value
	Neg	%	Post	%	N	%	
Neg	16	46	0	0	35	100	0,000
Post	19	54	0	0	35	100	

Source: Primary Data, 2020.

Graph 1. *Results of Examination of Intestinal Nematode Eggs in Feces Between Flotation Method and Sedimentation Method.*



Source: Primary Data, 2020.

Based on graph 1 Examination of Intestinal Nematode Eggs in Feces Between the Flotation Method and the Sedimentation Method, 19 people were obtained positive results on the flotation method with a percentage of 54% while negative results were 16 people with a percentage of 46%. And in the sedimentation method the results obtained were all negative, namely as many as 35 people with a percentage of 100%.

Table 3 McNemar Test

Method of Examination of Intestinal Nematode Eggs	Significant (p-value)	Level of Signification	Information
Flotation Method and Sedimentation Method	0,000	0.05	Significant

Source: Primary Data, 2020

DISCUSSION

Worms is an infectious disease caused by parasites in the form of worms. Worms generally do not cause serious diseases so they are often ignored even though they actually cause health problems. But in cases of severe infection or exceptional circumstances, worms tend to mislead other diseases and can often be fatal. Worms infection is a disease that is transmitted through food and drink or through the skin where the soil is the transmission medium caused by roundworms (Ascaris lumbricoides), whipworms (Trichuris trichiura), and hookworms (Ancylostoma duodenale and Necator americanus) [11].

Worms are often found in warm and humid climates, worm disease is the most common infectious disease affecting all ages. Worms does not always cause death or even serious disease, but in a chronic condition it can cause disturbances in absorption and metabolism of nutrients [5].

Many factors can influence the occurrence of worms, including: Climate which is the main determinant of the spread of this infection, humidity and hot temperatures are very important for larval development in the soil. These climatic factors include: temperature, rainfall, sunlight and wind. Temperature is very

important for worms to continue their life cycle. Also important determinants are the lack of availability of water and sanitation. In this situation STH species generally become endemic. Sunlight plays a role in providing heat, especially to eggs and larvae on the soil surface. Likewise, wind plays a role in accelerating the drying process and the spread of infective worm eggs through the dust [10].

Having a clean and healthy lifestyle and improving individual and environmental health is an effort to prevent worm infection [6]. The flotation technique shows high sensitivity as a diagnostic tool for soil transmitted helminth infection with low infection rate. It is therefore widely used as a definitive diagnosis in the hospital setting and in the scope of epidemiological surveys. On the one hand, this technique is quite complex and expensive because it uses centrifuge in it but is still the best among other methods [7].

Based on Table 4.1 Results of Examination of Intestinal Nematode Eggs in Student's Feces at SDN 11 Telaga, it is known that from 35 samples, the results of examination of intestinal nematode eggs using the flotation method are 54% positive and 46% negative, while the results of examining intestinal nematode eggs in feces from the sedimentation method are 100% negative This is because the solution used, namely 0.2% NaOH solution, is very corrosive, which when dissolved in water will cause an exothermic reaction which causes a decrease in temperature in the solution due to the transfer of heat from the system to the environment [4]. With its corrosive nature and when dissolved in water it will cause an exothermic reaction, it can help destroy feces and release some worm eggs that stick to hard feces, the breakdown of feces changes the form of feces that were originally hard to become fine so that it is difficult to settle and takes an additional 15 minutes to settle the worm eggs. This also causes hookworm worm eggs to be destroyed while waiting for the eggs to settle. As for the flotation method using 0.9% NaCl solution, it does not have heat release properties when dissolved in water and does not have corrosive properties, this can be seen in the stool which still retains some of its original form, hence the results using 0.9% NaCl solution clearer and cleaner. Based on the examination through various methods, it is known that each method has its own effectiveness in finding different types of worms with different morphology and physiology [8].

The examination of intestinal nematode eggs used in this study was the flotation and sedimentation method in accordance with the suggestions of previous studies. This study used both methods because they were able to identify mild worm infections [9]. However, the two methods have different inspection principles. Based on the results of the research that has been carried out there are significant differences because the materials and working techniques for the two methods are different where the use of the solution for the flotation method is Nacl and for the sedimentation method using NaOH solution. The flotation method itself The flotation method is a technique for examining worm parasites based on specific gravity, in this case the density of worm eggs is smaller than NaCl (examination reagent), so that the worm eggs will float. The advantage of this method is that it is quite easy to work with. It is cheaper than the centrifuge method and can be done even if it does not use a centrifuge, and in this method eggs are easy to observe and good for examining minor or severe infections. The sedian produced by the flotation method is cleaner than the sedimentation method because the worm eggs will be separated from the feces so that the worm eggs can

be seen clearly, but this method has the disadvantage that it takes a long time for the eggs to float. The sedimentation method is a method of examining worm eggs that uses a working principle based on centrifugal force, so that the worm eggs (in the form of sediment) will separate from the distilled water (in the form of a supernatant). The advantages of this method are that it can be used for both minor and severe infections.

In general, the effectiveness of the fesflotation examination is influenced by the type of floatation solution, specific gravity, buoyancy time (flotation period) and the homogenicity of the solution after the centrifugation process. The floating solution plays an important role in causing the worm eggs to float so that they are easily observed. The way it works is based on differences in the density of the solution. chemical, so that the eggs float on the surface and also to separate large particles that are in the feces. The most common flotation methods used in the flotation method are saturated NaCl solution, glucose, MgSO4, ZnSO4 proanalis, NaNO3 and millet jelly [7].

CONCLUSION

Based on the research results described by the researcher, it can be concluded as follows:

1. Based on the results of examination of intestinal nematode eggs in student feces between the flotation method and sedimentation method at SDN 11 Telaga, it is known that from 35 samples there are results of examination of intestinal nematode eggs using
2. The results of the sedimentation method for examining intestinal nematode eggs in faecal samples were 100% negative.
3. There is a significant difference in the results of the examination between the flotation method and the sedimentation method for SDN 11 Telaga students.

REFERENCES

[1] Anorital. 2014. The Study of Hymenolepis nana Worms Disease. Indonesian Journal of Biotech Medisiana, Vol. 3 (2): 37-47.

[2] Cahyono Tri. 2018. Applied Statistics and Health Indicators. CV Budi Utama, Yogyakarta.

[3] Gorontalo Provincial Health Office. 2018. Health Profile of Gorontalo Province. Gorontalo

[4] Glory Riama, 2012. The Effect of H2O2, NaOH Concentration and Time on the White Degree of Pulp from Pineapple Crowns, Journal of Chemical Engineering, No.3, Vol 18, p. 26

[5] Hairani, B., and L. Indriyati. 2016. The prevalence of Trichuriasis in Harapan Maju Public Elementary School Children: A Case Study in Tanah Bambu District, South Kalimantan Province Disease Vector Journal, Vol. 10 (1): 25-32.

[6] Indonesian Ministry of Health, Directorate General of PP and PL. 2012. Guidelines for the Control of Worms. Jakarta: Pages 8-23.

[7] Limpomo, BA Sudaryanto. 2014. Differences in the Flotation Method Using ZnSO4 solution with the Kato-Katz Method for Fecal Examination, Undetgraduate thesis. Faculty Of Medicine Diponegoro University.

[8] M. Rofiq Nezar, 2014. Types of Worms in Cow Feces in Tpa Jatibarang and Ktt Sidomulyo, Nongkosawit Village, Semarang, Unnes Journal of Life Science, Vol: 3 No: 2, Hlm: 99-100

[9] Natadisastra, D. and Agoes, R., 2005. Medical parasitology in terms of the affected organs. Jakarta: Book Medical Publishers EGC.

[10] Noviana, A. 2016. "Examination of Soil Transmitted Helminth Infection in Brick Maker Workers in Glodogan Village". KTI. Surakarta: Faculty of Health Sciences, Setia Budi University.
[11] Regina Marieta Puspa, Ryan Halleyantoro, Saekhol Bakri. 2018, Comparison of fecal examination between the ordinary sedimentation method and the formal ether sedimentation method in Detecting Soil Transmintted Helminth, Dipenogoro Medical Journal, Vol: 7 Hlm: 527-529,533 Medisiana Indonesia, Vol. 3 (2): 37-47.
[12] Rezki Nurul, Berliana Naomi, Rumondang Sari Aritonang. 2018. Identification of Soil Transmitted Helminth (STH) Eggs in 91 Elementary School (SDN) Students in Rumbai Pesisir District, Pekan Baru.
[13] Journal of Science and Technology Laboratory VOL. 3 NO. 1 (2018) 18-21.
[14] Sugiyono. (2012). Qualitative and Quantitative Research Methods R & D. Bandung: Alfabeta
[15] Tangel, F., SB Tuda, and VD Pijoh. 2016. Intestinal Parasite Infection in Coastal Elementary School Children in Wori District, North Minahasa Regency. Journal of e-Biomedics, Vol. 4 (1): 70-75.
[16] World Health Organization (WHO). 2016. Soil Transmitted Helmints Infections. Accessed 24 April 2020.