

Prevalence And Levels Of *Soil Transmitted Helminths* (Sth) Infection Associated With Gender And Age In Cakung Public Elementary School On District Binuang Serang Banten Area

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Abstract

Underdeveloping countries have a high prevalence of worm infection. Some causes of this condition are poor environmental sanitation, lack of personal hygiene, consuming food contaminated with worm's eggs and low levels of socioeconomic education. More than 1,5 billion people or 24% of world population are infected by *Soil Transmitted Helminths* (STH). Almost 60-90 % Indonesian children have STH infection in their bodies. The increases of this condition can disturb the next figure of the country. The aims of the study is to figure out the prevalence and STH infection levels and also to see the correlation in every variable with gender and age. The study was conducted at Cakung Public Elementary School in Binuang District Serang Banten Area on 2016 with cross sectional method. Samples of feces came from the student of public elementary school, with a total collected sample was 55 samples that have complied the inclusion criteria such as 6-12 years old and approved the informed consent form. Beside that, The sample also have complied the exclusion criteria such as consume worming medicine, didn't collect feces, and died. Sampling inspection conducted by the method of Kato-Katz. The result of these study was found that nine student have STH infection or 16,4% prevalence with mild levels. Species of STH which found are *Ascaris lumbricoides* (68,75%), *Trichuris trichiura* (31,25%), and didn't find any *Necator americanus*'s species. The highest frequency was founded on 6-8 years old. Based on statistical calculations there is no significant association between the prevalence and levels of STH infection with gender and age.

Keywords : *Soil Trasnmitted Helminths (STH), Elementary School, Prevalence and Levels*

1. INTRODUCTION

More than 1.5 billion people or 24% of the world's population was infected of Soil Transmitted Helminths (STH), in both of the tropical and subtropical regions. High prevalence of infection found in sub-Saharan Africa, America, China, and Southeast Asia. STH is transmitted through the egg shape of human feces-contaminated the soil, especially in environments with worst sanitation¹. The prevalence of *Ascarislumbricoides* in Indonesia reached over 70% in some villages, including the village on Sumatra (78%), Borneo (79%), Sulawesi (88%), West Nusa Tenggara (92%) and West Java (90%)². In addition, the prevalence of worm infection in children in Indonesia is still quite high, ranging from 60-90%³. The result of worm infection on

2002 in Indonesia by Ditjen P2PL mention that 31.8% of elementary school students suffered worm infection⁴. Worm infection causes anemia, malnutrition, impaired growth and intelligence. Persistent infection will reduce the quality of human resources, and it can occur at any age, either in infants, children or adult. Therefore, the data and the prevalence of infection is important for prevention and elimination of intestinal worms, but unknown prevalence and infection rates for primary school pupils in the District Binuang Serang district, Banten. This study aims to determine the prevalence and levels of Soil Transmitted Helminths Associated with gender and age to the students at Cakung Public Elementary School On District Binuang Serang Banten Area.

2. METHODS

This study is an observational study conducted with cross sectional approach. The population in this study were students of Cakung Public Elementary School On District Binuang Serang Banten Area in 2016. The sample was part of the population who have the inclusion criteria are 6-12 years old and fill out the *informed consent* for respondents and respondent's parents. While Exclusion criteria such as taking worming tablets during the last 6 months, did not return samples of feces, and died. The minimum sample required in this study are as many as 38 samples. To determine the sample, first, the respondent was given *informed consent* sheet. And then, for the respondent who accepted for the sample was given the pot of feces and the procedure paper. Samples have been collected directly analyzed by researchers and two laboratorian on Laboratory in Faculty of Medicine, Yarsi University. The method for analysis this study did with Kato Katz method. Preparation is necessary for this method is set up tools and materials such as malachite green, glycerol, *cellophane tape*, oil paper, wire screen, perforated cardboard, glass objects, sticks, and microscopes. Then the first thing to do was to prepare a solution of malachite green in advance by mixing malachite green powder 3% of 1 ml to 100 ml glycerol and 100 ml of aquadest, then soak the cellophane tape that already cut in a piece to the malachite green solution for at least 24 hours. After that, a feces sample to be observed is placed on paper oil then filtered using filter paper, measured with a perforated carton in order to get the appropriate gram, and put on the object glass and cellophane tape affixed thereon to the observed using a microscope. Chi square tests were used to limit the significance if $p < 0.05$, which means that there is a relationship between two variables tested and if $p > 0.05$ there was no correlation between the two variables were tested.

3. RESULTS

There were collected 55 samples of child student who has accepted the criteria and the results, nine children (16.4%) were infected STH, whereas 46 children (83.6%) are not infected (Table 1). Type of STH's egg that found were *Ascaris lumbricoides* obtained in three children (5.5%) and *Trichuris trichiura* obtained in 6 children (10.9%) and zero for hookworm (Table 1). Based on the WHO criteria are expressed the result with mild infection because the number of STH worm eggs that found in each type, no more than the numbers on a classification of each type (Table 2).

Table 1. Prevalance of *Soil Transmitted Helminths* (STH) infection and Kind of STH (*A. lumbricoides*, *T. trichiura*, and Hookworm)

Levels of Infection	<i>A. lumbricoides</i>	<i>T. trichiura</i>	Hookworm
Mild	3	6	-
moderate	-	-	-
Severe	-	-	-

Table 2. Level of infection of *Ascaris lumbricoides*, *Trichuris trichiura*, and Hookworm

Infected	N	(%)
<i>Ascaris lumbricoides</i>	3	
<i>Trichuris trichiura</i>	6	16,4%
Hookworm	0	0%
Not Infected	46	83,6%
Total	55	100

Associated between gender and age with STH infection showed on 3rd and 4th table. The result of Chi Square test showed that there is no Associated sense between gender and age with STH infection ($p > 0,05$).

Table 3. Corellation between Number of Age with STH Infection.

	STH Infection	
	Positive	Negative
6-8	5	20
9-12	4	26
Total	9	46

Table 4. Corellation between Gender with STH Infection

Gender	STH Infection	
	Positive	Negative
boys	4	20
girls	5	26
Total	9	46

DISCUSSION

Research conducted in Cakung Public Elementary School On District Binuang Serang Banten Area 2016 showed the prevalence of ascariasis worm infection and trichuriasis of 16.4% and based on WHO criteria the rate of infection is mild. Several studies in other areas also showed

the prevalence and infection rates are getting lower. It can be seen from the study conducted in several places in Indonesia such as Chadijah et al. study, In 2009 in Central Sulawesi Palu result prevalence of worm infection of 51.59%⁶ Malinau Research in South Kalimantan in 2012 showed a decrease in the prevalence rate infections are quite large, to 6.16%⁷. research in SDN Tarigu Cipanas in 2012 also showed the results of the prevalence of infection *Ascaris lumbricoides* and *Trichuris trichiura* respectively by 2.0% and 16.7%⁸. Based on some of the research results, it is known that the prevalence of worm infection tends to decline from year to year.

The mild level of worm infection in Cakung Public Elementary School On District BinuangSerangBanten Area can be caused by several factors such as temperature changes due to the "global warming". Changes in temperature which could cause soil conditions that consistency to be different, but as we known that worms STH can develop optimally in the tropical climate with an optimal temperature for the eggs of *Ascarislumbricoides* 25⁰C, 30⁰C for *Trichuristrichiura* eggs, 23-25⁰C for larvae *Ancylostomaduodenale* and 28 -32⁰C larvae of *Necatoramericanus*⁹. In addition for the tropical climate, footwear usage habits while doing the activity and habits of latrine use in children may be a factor decreasing pupil worm infection rate of⁷.

Type of worm eggs are most commonly found in Cakung Public Elementary School Serang is *Trichuris trichiura* then *Ascaris llumbricoides*. The high infection of *Trichuris trichiura* always followed by high *Ascaris lumbricoides* infection that can be caused by both worms have the same environmental conditions, namely in the temperate humid. Besides these two types of worms has a same way of infected, namely to mature eggs ingested. Research conducted by Chasanah and Sumekar in 2015 showed that the results for *Ascaris lumbricoides* 52.72% and 42.72% for *Trichiuris trichiura*¹⁰. As for the research conducted at several elementary schools in Indonesia showed the highest prevalence of worm *Ascaris lumbricoides* (74.70 to 80%) and *Trichuris trichiura* (25.30 to 68.42%)⁷.

Worm disease can occur in all age groups and can occur in boy as well as girl¹¹. This is consistent with some of the data that exist in Indonesia, with 60% -80% occur at primary school age (7-15 years)¹². Other research data conducted by Agustaria in 2008 in an elementary school in Samosir showed 48.5% of infections occurred in children aged 6-8 years, 39% aged 9-11 years and 11.9% in the age group ≥ 12 years. Research conducted by Sandy et al. 2015 Elementary School District Karoom Papua Arso with the percentage of STH infections in boys 27.2% and girls 32.2%¹³. In addition, research conducted at the Primary School in Samosir shows the results 57.4 % boys and 42.6% of girls were infected with worms. Research conducted inCakung Public Elementary School On District Binuang Serang Banten Area had positive results in five children (55.6%) aged 6-8 years and four children (44.4%) aged 9-12 years. Both sexes are equally experienced worm infection that five people on girls and four people on male students. Statistical calculations no relationship was found between age and gender because the value of $p > 0.05$.

4. CONCLUSION

Obtained from the data it can be concluded that the prevalence and infection rates occurring in students at Cakung Public Elementary SchoolOn District Binuang Serang Banten Areaare

relatively low and not found a relationship between the prevalence and levels of STH infection by gender and age, based on p values were obtained more than 0.05.

SUGGESTION

Informed consent sheet is required in this study to determine the sample was appropriate with criteria or not. It is currently giving informed consent sheets are advised to immediately provide to parents in order to receive information in clear and true. Having good coordination with the school can help the collection of samples without any problems. Preparation of malachite green and soaking cellophane tape better be longer in order to get the green color is more real.

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