

Identification of Intestinal Nematode Worm Eggs in Feces of Stunting Toddlers

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Article info:

Received: 9 December 2024
 Revised: 11 December 2024
 Accepted: 25 January 2024



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E-ISSN: [3023-3011](https://doi.org/10.23958/mcha/vol02/i01/47)

Abstract

Background: The problem of stunting is closely related to nutrition and health problems. The problem of malnutrition that currently occurs among others due to intake that is not in accordance with the desired conditions. Helminth infection is one of the causes of stunting that occurs in several developing or poor countries and occurs in the under-five age group, including in Indonesia. The purpose of the study was to identify intestinal nematode worm eggs in the feces of stunting toddlers.

Method: The method used in this study is the flotation method or flotation method on 253 fecal samples of stunting toddlers.

Results: the results of examination of intestinal nematode worm eggs on stunting toddlers in the working area of the Curahdami health center, Bondowoso health centre obtained as many as 130 (51.4%) feces of stunting toddlers positively infected with intestinal nematode eggs soil transmitted helminth types *Ascaris lumricoides* and *Trichuris Trichura*, and as many as 123 (48.6%) negative samples infected with intestinal nematode eggs soil transmirted helminth. 130 positive samples are known to be infected with 2 types of soil transmitted helminth worm eggs, namely *Ascaris lumricoides* and *Trichuris trichura*.

Conclusion: Stunting suffered by patients due to infection with worms *Ascaris lumricoides* and *Trichuris trichura*. Children are expected to use footwear when going to play.

Keywords: stunting, worms, *Ascaris lumricoides*, *Trichuris trichura*

Introduction

Stunting is a chronic condition in which young children's growth is stunted due to chronic malnutrition, making children appear shorter than their age. In stunted children, growth processes such as height or weight are disrupted so that body growth occurs that is not in accordance with their age ratio.¹ The problem of stunting is closely

related to nutrition and health problems (baduta) for pregnant and lactating women, newborns and children under the age of 2 years. The problem of malnutrition that currently occurs among others due to intake that is not in accordance with the desired conditions. This is seen as an ecological problem that is not only due to the inadequate availability of certain foods and nutrients, but can

also be caused by poverty, poor environmental sanitation, and lack of information about nutrition. In addition to social financial conditions, the social financial stage also has an impact on the family's ability to fulfill toddlers' food desires, as well as social and environmental conditions.² In addition, other factors that are known to affect the incidence of stunting are birth weight, birth length, gestational age and maternal parenting.³

According to the World Health Organization (2023), states that more than 150.8 million (22.5%) children under 5 years old suffer from stunting worldwide, 90% of which occur in developing countries. In Southeast Asia, Indonesia is among the highest countries with a prevalence of stunting sufferers, which is 36.4%, percent between 2005-2017.⁴

From year to year the prevalence of stunting sufferers in Indonesia has decreased as in 2019 the prevalence of stunting in children under five dropped to 27.7%, while in 2021 it dropped to only 24.4%. The government aims to reduce stunting in Indonesia to just 14% by 2024. Therefore, an innovative strategy is needed in achieving the target goal of reducing the number of stunting toddlers by 2.7 per year is increasing.⁵

At the beginning of 2022, based on the Indonesian Nutritional Status Study survey, the rate of stunting reduction in Bondowoso district was 30.8 percent and increased by 50% at the end of the year based on survey results from the Bondowoso health office. In Bondowoso health centre itself, the highest contributor to the stunting rate in toddlers is in Curahdami district. Where in 2019 toddlers were stunted as much as 8.6%, then in 2020 as many as 51.8% and there was an increase again in 2021, which was 74.5% of children suffering from stunting.^{6,7}

Stunting itself can be triggered by several factors such as directly and indirectly. Based on factors directly caused by nutritional intake, children's health and various kinds of infections. And indirectly related to food availability and household eating habits, parenting behavior, environmental health, etc.⁸ Directly one of the causes of stunting is worm infection which is an infectious disease that occurs in several developing or poor countries and occurs in the toddler age group. If toddlers continue to be infected with

worms, one of the impacts that can be caused is stunting.⁹

Based on research conducted oleh Asdinar et al (2021) about relationship worms with stunting in toddlers using the sedimentation method in Bulukumba health centre. The results of the study conducted showed that as many as 6 toddlers (30%) of 20 children examined showed positive results infected with worms type *Ascaris Lumricoides*.¹⁰ Likewise, research conducted by Andi, et al (2022) on the Description of Worm Eggs in Stunting Toddlers Using Anthocyanin Staining from Purple Sweet Potato Extract Flotation Method in Bulukumba Health centre. Results were obtained from 19 respondents as many as 5 samples (26.3%) showed positive results for STH worm infection. The percentage of worms in stunted toddlers by sex was 1115.8% for boys and 10.5% for girls. The increase in intestinal worms in boys under five is caused because boys are more active in interacting outside the home slammed by girls under five.¹¹

There are two main types of fecal examination materials, namely microscopic and numerical. The former refers to qualitative research and the latter refers to quantitative research. In qualitative studies, thick preparation techniques are used, flotation method, direct method (direct slide), sedimentation method and tape method are also used. On the other hand, in quantitative studies, the method used is the Stoll method. This method is used in addition to the native method, and kato-ketz. In this study, the flotation method was used because in this method worm eggs and other suspensions will separate, provide good field of vision, and are used to diagnose mild to difficult infections. The solution used in the flotation method is a solution whose gravity or mass specific gravity is greater than the specific gravity of the worm egg mass so that the cacin causes the worm egg to lift up (float).¹² The principle of the flotation method is that worm eggs float lighter due to a NaCl concentration of 0.9% and floating particles to be examined.^{13,14}

Method

Research design

The research design used was a descriptive study that explained whether intestinal nematode worm egg infection was one of the causes of stunting in toddlers in the work area of the Curahdami health center, Bondowoso health centre.

Sample

Based on the number of stunted toddlers at the sampling location of this study located in the working area of the Curahdami health center, 351 stunted toddlers were found in the Curahdami sub-district. However, after a review was carried out to see the suitability of the criteria included in the part of the research sample, it was found that only 253 stunted toddlers were included in the part of the subjects of this study. Sampling itself is carried out by taking toddlers who meet the criteria of research subjects.

Tools and materials

The tools used are microscopes, sample pots, test tubes, glass decks, glass objects, tissue, toothpicks, measuring cups, test tubes, stirring rods, stopwatches, analytical scales.

The materials used are saturated NaCl, fecal samples, aquadest, and labels.

Examination procedure

1. Flotation method
Put feces (± 1 grams) into a test tube then add saturated NaCl solution and homogenize. Added again NaCl saturated to full later. Put the glass deck on top of the test tube and leave it for 45 minutes. Take the glass deck and place it on top of the glass object, then examine it under a microscope with objective lens magnification of 10x and 40x.
2. Natif Method (Direct)
Dripped 2% eosin solution on object glass. Enough faces are taken, then mixed with eosin and removed the rough part of the preparation. Place the glass deck on top of the preparation slowly so that it is evenly distributed and make sure that there are no bubbles. Observed under a microscope using 10x and 40x magnification. Then the results are recorded.

Results

It was found that the intestines were found as many as 13 people with a percentage (36.1%) and negative results of 23 with a percentage (63.9%) (Table 1). The toddler who tested positive for worms was infected with a type of Soil Transmitted Helminth (STH) worm or better known as the intestinal nematode worm.

Table 1. Frequency distribution of intestinal nematode worm egg identification results in stunting toddler feces In the working area of the Curahdami health center, Bondowoso Health centre

No	Results	Frequency	Percentage
1	Positive	130	51.4
2	Negative	123	48.6
Total		253	100

It is known that the most infected types of worms are *Ascaris lumricoides*, as many as 70 people with a percentage (53.8%) and *Trichuris trichura* found to infect as many as 60 people with a percentage (46.2%) (Table 2).

Table 2. Frequency distribution of positive results of intestinal nematode worm eggs in the feces of stunting toddlers in the working area of the Curahdami health center, Bondowoso Health centre

No	Types of worms	Frequency	Percentage
1	<i>Ascaris lumricoides</i>	70	53.8
2	<i>Trichuris trichura</i>	60	46.2
Total		130	100

Discussion

From the results of this study, 130 toddlers or 36.1% were infected with worms in stunting toddlers who were examined. Stunting itself can generally be caused by insufficient nutritional intake in toddlers, causing disruption of the growth and development process in toddlers. However, according to researchers, apart from nutritional problems, stunting can also be influenced by several factors, one of which is due to helminthiasis. Worms in children and toddlers can cause weak physical conditions and have a high risk of infection.^{15,16}

In patients with worms, usually the type of Soil Transmitted Helminth (STH) worm that infects humans, namely the types of worms *Ascaris Lumricoides* and *Trichuris Trichura*. It is known that study subjects who are positively infected have a house location in the coastal area, making it easier for worms to infect toddlers who have the habit of

not applying a healthy lifestyle and clean life. Lifestyles such as not wearing footwear when playing in the sand make it easier for worm eggs to move and infect toddlers.^{17,18}

Coastal areas have a high enough humidity level because they are close to water so that it can be a contributing factor to the high rate of worm infections in toddlers. Transmission of worm eggs can be through direct contact with infected soil and open food so that it is easy to infect through dust containing eggs.^{19,20}

In identifying the presence of worm eggs can be done several methods such as flotation, sedimentation, kato-ketz, and direct methods or native methods. In this study, the method used was the native method and the flotation method where the laruan used was saturated NaCl, the reason for the research with the flotation method was because this method could identify worm eggs that were still light, and could separate feces from worm eggs to facilitate identification. In addition to the flotation method, the use of the native method in this study aims to reconfirm the samples examined using the flotation method.²¹

Conclusion

Based on the results of the research that has been conducted, it can be concluded that from 253 fecal samples of stunting toddlers in the working area of the Curahdami health center, Bondowoso health centre, 130 toddlers were obtained with a percentage of 51.4% positive for soil transmitted helminth worms, while 123 others were negative. A total of 130 positive samples are known to be infected with 2 types of soil transmitted helminth worm eggs, namely *Ascaris lumricoides* and *Trichuris trichura*.

Acknowledgment

Our gratitude goes to LPPM Politeknik Kesehatan Kemenkes Surabaya and Universitas Nahdlatul Ulama Surabaya, who have motivated, and supported us to be active in creating, researching, writing, and publishing scientific papers

Conflict of interest

The authors declare that they have no competing financial, professional, or personal interests that could influence the performance or presentation of the work described in this

manuscript. We have not published this article yet before.

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