

# Prevalence of Subclinical Giardiasis in Primary School Children in Khartoum State Sudan

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## ABSTRACT

**Background:** Subclinical giardiasis refers to the presence of the Giardia lamblia parasite in a person who does not have any apparent symptoms. This can occur in both children and adults and can be difficult to diagnose because the person may not know they are infected.

**Methods:** Two-hundred Primary school children aged from 6 to 12 were tested for the presence of the Giardia lamblia parasite in stool using the wet mount technique and using chromatographic immunoassay for the qualitative detection of Giardia antigen ( $\alpha$ 1-giardin and CWP1) in the stool.

**Results:** Out of the 200 samples, (98) 49% samples positively identified the presence of Giardia lamblia cyst when using the wet mount technique, while (120) 60% of the samples were positive for Giardia antigen when using the chromatographic immune assay (Cre Test)

**Conclusion:** Some signs of subclinical giardiasis in children include abdominal pain, diarrhea, and weight loss, but these symptoms may be mild or absent. Children with subclinical giardiasis may be asymptomatic but still able to spread the infection. It is important to note that subclinical giardiasis is still an infection, and can be transmitted to others, which is why good hygiene practices, including washing hands and treating drinking water, are important to prevent the spread of the parasite.

**Keywords:** Giardia Lamblia; Giardia Intestinalis Giardiasis; Subclinical Giardiasis

## Background

Giardia lamblia, also known as Giardia intestinalis or Giardia duodenalis, is a parasitic protozoan that causes a diarrheal illness called giardiasis [1]. The parasite lives in the small intestine of infected humans and animals and can be transmitted through the fecal-oral route. This can happen through contaminated water, food, or contact with infected individuals. Children are at a higher risk of getting infected than adults, due to their tendency to put objects in their mouths, poor hand hygiene, and exposure to contaminated water sources. They are also more likely to develop complications from the infection [2]. Giardiasis primarily affects the small intestine. The parasite attaches to the brush border of the small intestine, where it interferes with the normal absorption of nutrients, leading to malabsorption and nutrient deficiencies [3].

One of the key pathological effects of giardiasis is the damage to the microvilli, which disrupts their normal structure and function, leading to decreased absorption of nutrients and water [4]. The parasite also produces secretory products, such as toxins and enzymes, that further damage the brush border and disrupt the balance of the intestinal microflora. This can lead to inflammation of the small intestine and a condition called «intestinal villous atrophy», which is characterized by loss of the height and number of the microvilli, this can cause chronic diarrhea or malnutrition [5]. Additionally, in some cases, the parasite can cause damage to the immune system by suppressing the production of certain cytokines, which help the body fight infections, this can lead to chronic giardiasis [6].

Chronic giardiasis can be serious and harder to treat and can lead to malnutrition, weight loss, and even stunted growth. While most cases of giardiasis are self-limiting, chronic giardiasis can require long-term treatment and monitoring by medical professionals [7]. Subclinical giardiasis refers to an infection caused by the *Giardia lamblia* parasite in which the individual does not experience any noticeable symptoms. It is thought to occur in about 20-30% of the infected individuals [8]. Although around 50% of all giardiasis cases are asymptomatic, these individuals can still serve as a reservoir for the parasite and can spread the infection to others through their feces [9]. There is no unique symptom or sign of subclinical giardiasis, and it can be determined only through laboratory examination of stool sample or serological testing.

## Methods

Two hundred School children from the ages 6-12 were included in this cross-sectional study, a stool sample was collected and tested for the presence of the *Giardia lamblia* parasite using both the wet mount technique and the presence of the *Giardia lamblia* antigen using a one-step-colored chromatographic immunoassay for the qualitative detection of *Giardia* ( $\alpha$ 1-giardin and CWP1) in stool samples. *Giardia* (CerTest Biotec S.L. Spain).

## Results

Out of the 200 samples, (98) 49% samples positively identified the presence of *Giardia lamblia* cyst when using the wet mount technique. In contrast (120) 60% of the samples were positive for *Giardia* antigen when using the chromatographic immune assay (Cre Test) (Figure 1).

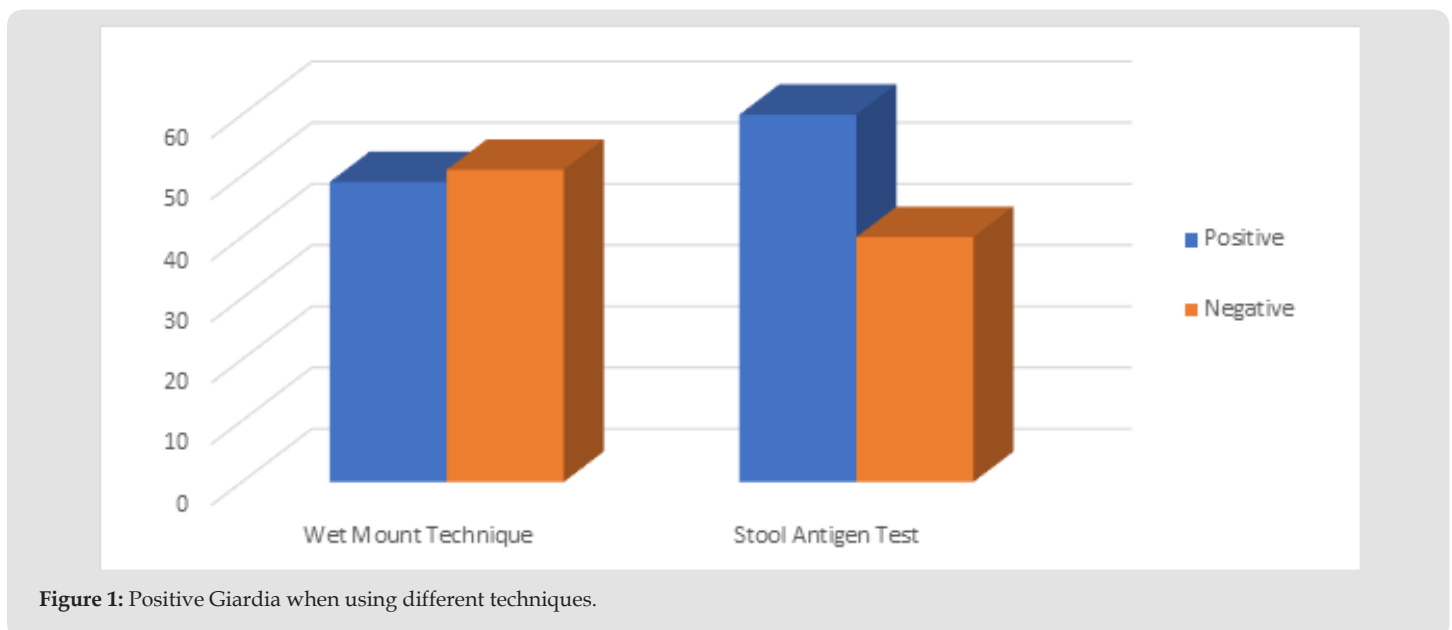


Figure 1: Positive Giardia when using different techniques.

## Discussion

Subclinical giardiasis refers to the presence of *Giardia lamblia*, in a person who does not have any apparent symptoms. Infection can occur in both children and adults and can be difficult to diagnose because the person may not realize they are infected. Subclinical giardiasis in children can cause abdominal pain, diarrhea, and weight loss, but these symptoms may be mild or absent. Despite being asymptomatic, children with subclinical giardiasis can still spread the infection. The long-term consequences of subclinical giardiasis are not well understood. However, several studies suggested that subclinical *Giardia* infection may lead to a decreased ability to absorb nutrients and can lead to malabsorption. It can also potentially lead

to chronic diarrhea and weight loss in some individuals [10-12]. It is important to note that subclinical giardiasis is still an infection, prevention of giardiasis in children is similar for adults and includes maintaining good hygiene practices such as regular handwashing, preventing contamination of food or water, and proper treatment of drinking water. It's important to seek medical attention when suspecting giardiasis in children as this infection can have a long-term impact on their health.

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