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Serological Detection of Giardiasis in Children with Diarrhea

Fatima Hashim Abbas [1]

[1] Department of Biology, College of Science, Al-Qasim Green University, Babil, Iraq

Abstract: This study aimed for serological detection of giardiasis in children with diarrhea. The present study included the acquisition of 126 faecal specimens from a diverse cohort of children spanning all genders and age ranges. These samples were submitted to the laboratory located in Babylon province, Iraq, on many occasions over the period from 2020 to 2022. The gathered specimens were recorded in a tabular format, subsequently leading to the transportation of all faecal samples to the laboratory. Following this, a thorough examination of all samples was conducted using a light microscope, and any samples that raised concerns were subjected to further analysis employing a serological methodology. All samples that were predominantly recognised as *G. lamblia* in the laboratory were subjected to examination using a serological test. The serological test used an ELISA kit manufactured by Sanlong, and the instructions provided by the manufacturer were followed. The overall prevalence of *G. lamblia* infection in Babylon city was found to be 5.6%. Specifically, the infection rate among men was 4.1%, while among females it was 6.5%. In relation to the age cohorts, all participants under study were categorised into three distinct age groups. Notably, the age group including persons aged 6-10 years exhibited the greatest infection rate at 7.1%. Additionally, infection rates of 4.4% and 2.6% were seen in the age groups of 1-5 years and above 10 years, respectively. Infections were seen in faeces samples exhibiting semi-formed consistency, loose consistency, and watery consistency, as indicated by the stool types. The prevalence of infection was greater in the loose type.

In conclusion, the present cross-sectional investigation indicates that the incidence of giardiasis in Babylon city is very low. Based on the findings, it can be inferred that the incidence of *G. lamblia* infection among children is also low. Furthermore, no significant variations were observed in relation to stool type and gender. Nevertheless, it is crucial to implement targeted and appropriate health programmes for the prevention of this disease.

Keywords: Giardia, Babylon, children, sex, age.

Introduction:

Diarrhoea is well recognised as a significant contributor to morbidity, particularly in poor nations (1). Annually, there is a global occurrence of about 500 million episodes of acute diarrhoea in children under the age of five (2).

Diarrhoea often arises from infections caused by many pathogens, including viruses, bacteria, helminths, and protozoa. Among the significant intestinal protozoa, *Giardia lamblia* is a prevalent

organism with a global distribution, particularly prevalent in regions characterised by warm and damp climates (3).

The reported prevalence of *Giardia* has been shown to range from 2% to 5% in industrialised nations, whereas in poor countries it ranges from 20% to 30% (4). The majority of inflections exhibit no symptoms, however, some inflections are linked to the presence of acute or chronic diarrhoea and intestinal irritation (5). These symptoms may lead to malabsorption and nutritional deficiencies, particularly in children (6, 7).

Giardia lamblia is transferred by the fecal-oral pathway as well as direct person-to-person transmission. In the majority of instances, it is often linked to the presence of water that has been polluted with sewage waste (8).

Multiple studies conducted in Iraq have consistently shown a notable prevalence of giardiasis among children aged 3 to 12 years, indicating a significant occurrence of intestinal parasitosis in the region (9-12).

This study aimed for serological detection of giardiasis in children with diarrhea.

Materials and Methods:

The present study included the acquisition of 126 faecal specimens from a diverse cohort of children spanning all genders and age ranges. These samples were submitted to the laboratory located in Babylon province, Iraq, on many occasions over the period from 2020 to 2022. The gathered specimens were recorded in a tabular format, subsequently leading to the transportation of all faecal samples to the laboratory. Following this, a thorough examination of all samples was conducted using a light microscope, and any samples that raised concerns were subjected to further analysis employing a serological methodology.

All samples that were predominantly recognised as *G. lamblia* in the laboratory were subjected to examination using a serological test. The serological test used an ELISA kit manufactured by Sanlong, and the instructions provided by the manufacturer were followed.

Results:

The overall prevalence of *G. lamblia* infection in Babylon city was found to be 5.6%. Specifically, the infection rate among men was 4.1%, while among females it was 6.5% (Table 1, Fig. 1). In relation to the age cohorts, all participants under study were categorised into three distinct age groups. Notably, the age group including persons aged 6-10 years exhibited the greatest infection rate at 7.1%. Additionally, infection rates of 4.4% and 2.6% were seen in the age groups of 1-5 years and above 10 years, respectively (Table 2, Fig. 2). Infections were seen in faeces samples exhibiting semi-formed consistency, loose consistency, and watery consistency, as indicated by the stool types. The prevalence of infection was greater in the loose type.

Table 1. The infection rate as it pertains to gender.

Gender	No. of infected individual	Percentage
Male (49)	2	4.1
Female (77)	5	6.5
Total (126)	7	5.6%

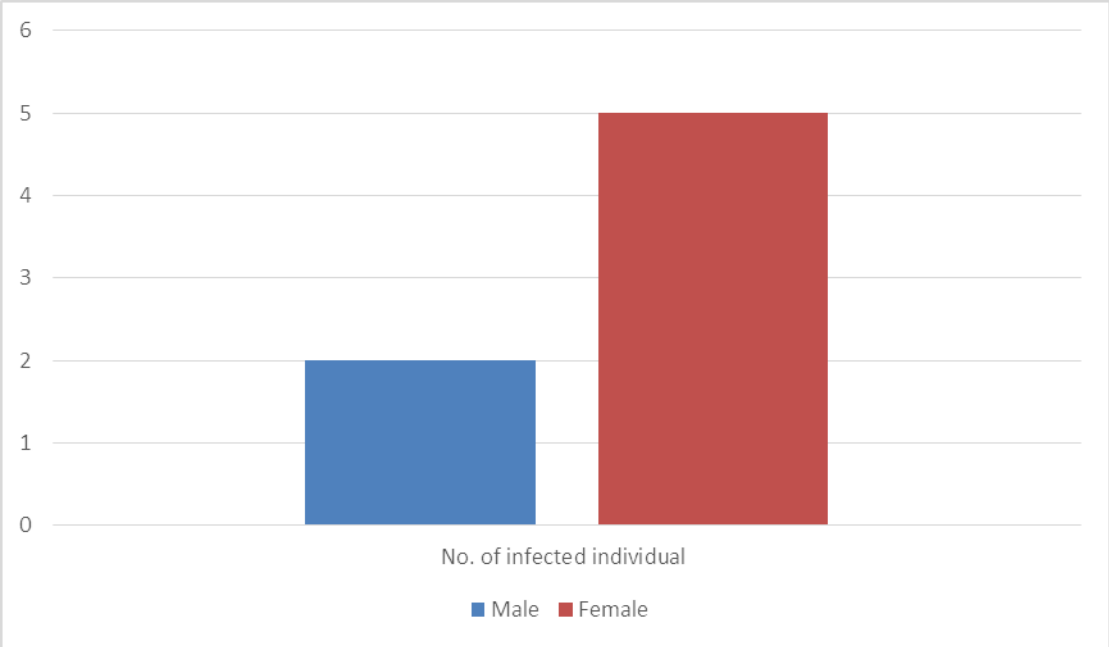

Figure 1. infection rate according to the gender

Table 2. infection rate according to the age groups

Age groups (years)	No. of infected individual	Percentage
1-5 y (45)	2	4.4
6-10 y (42)	3	7.1
More than 10 y (39)	1	2.6%

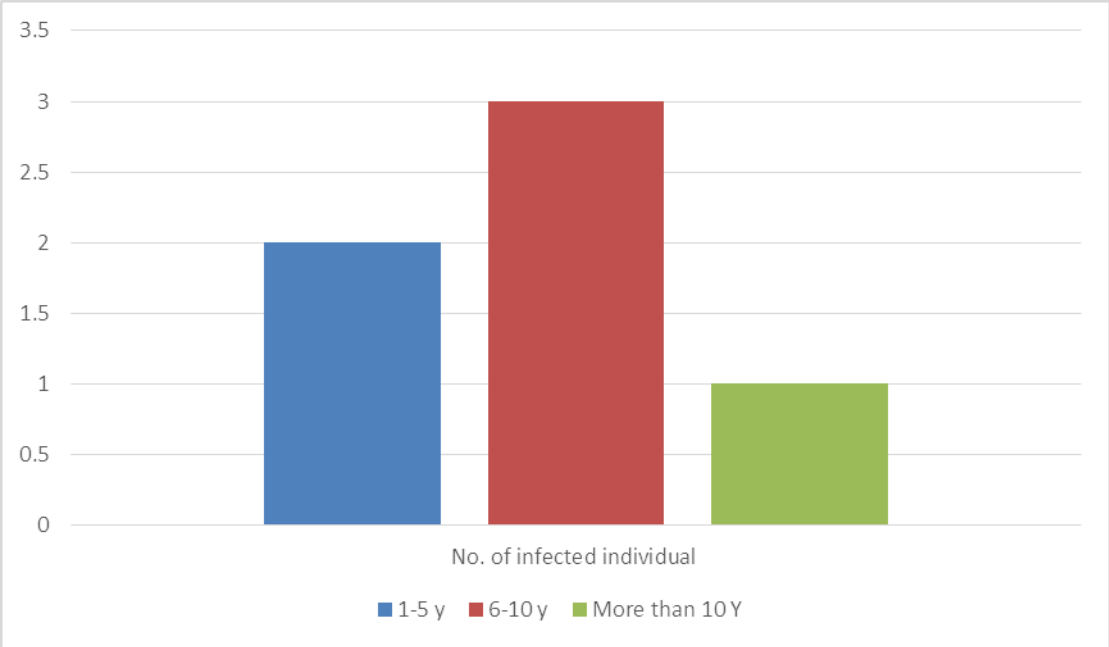

Figure 2. infection rate according to the age groups

Discussions:

Giardia lamblia is a notable protozoan parasite of the gastrointestinal tract that is associated with GIT illness, diarrhoea, iron deficiency anaemia, and growth impairments, particularly in children who live in communities with insufficient sanitation and contaminated sources of drinking water (13). The occurrence of this parasite at varying rates may be attributed to environmental variables, dietary resources, as well as geographic and socioeconomic situations. These differences need distinct approaches in the diagnosis and treatment of the associated sickness (14).

The present investigation documented a prevalence rate of 5.6% for infection in children, which aligns well with the findings reported by (15). However, it is notably lower than the prevalence rates reported by (16) in Iraq (8.1%) and (17) for giardiasis infection (10.6%).

In our investigation, it was observed that the number of infected females exceeded that of infected males, a finding consistent with previous studies conducted by (18) in Iraq and (19) in Brazil, where a higher prevalence of infection was reported among females compared to males. It is important to note, however, that a separate research (15) done in the Kurdistan area of Iraq found that men were more likely to get infected than females. This study uncovered age-specific differences in infection rates and prevalence. The infection rate was highest (8.57%) among those aged 6-10, and lowest (3.12%) among those aged 10 and older. Twenty) reports results that are consistent with these ones. Younger children may be more susceptible to infection due to their increased physical activity and poor hygiene practises, such as when they play vigorously on playgrounds or go to school (20).

Our study's findings of widespread giardiasis, as shown by many instances of loose stools, may be linked to less-than-ideal standards of both public and individual sanitation. This finding aligns with the conclusions drawn by (20) in their research conducted in Pretoria. The primary factors leading to fluid loss, watery diarrhoea, and damage to the intestinal mucosa include irritation, small intestinal surface inflammation, and the parasitic infection caused by *G. lamblia* (21).

Conclusions:

The present cross-sectional investigation indicates that the incidence of giardiasis in Babylon city is very low. Based on the findings, it can be inferred that the incidence of *Giardia lamblia* infection among children is also low. Furthermore, no significant variations were observed in relation to stool type and gender. Nevertheless, it is crucial to implement targeted and appropriate health programmes for the prevention of this disease.

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