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# The Prevalence of Parasitic Infection of *Entamoebahistolytica*, *Giardia lambilia* and *Enterobiusvermicularis* in Kilowa Governorate, Saudia Arbia

**Mohey El-Din Z. Abd El-Latif**

Zoology Department, Faculty of Science, South Valley University – Qena, Egypt

**Abstract:** ***This study aims to study the prevalence of Entamoebahistolytica, Giardia lambilia and Enterobiusvermicularisinfections in Kilowa Governorate, SaudiaArbia, by using the microscopic methods. The study was conducted on the (78) stool samples from diarrhea - suffering patients. Patients ages ranged from 1 to 15 years old and from both sexes to estimate the prevalence of someintestinal parasitic diseases in the general population using the data of laboratory of general hospital at Kilowa Governorate, by using the microscopic methods to distinguish between Entamoebahistolytica, Giardia lambilia and Enterobiusvermicularisinfections.The most common parasite was Enterobiusvermicularis(9%) and Entamoebahistolyticawas (6.4%), while the infection by Giardia lambiliawas 0 patient.***

## 1. Introduction

Intestinal parasites are parasitic primordial organisms that live in the human intestines and feed on digested food and blood and cause serious diseases that affect his health greatly. The most important of these parasites are *Entamoebahistolytica*, *Enteribiusvermicularis* and *Giardia lamblia*. Intestinal parasitic infection is a major health problem in many developing countries by increasing standards of health and controlling the carriers or intermediate hosts, most industrialized countries have successfully decreased the rates of infestation. In developing countries, however, geographic and socioeconomic factors as well as unpredictable factors such as natural disasters contribute to the problem. These countries are mainly located in warm or hot and relatively humid areas that, combined with poverty, malnutrition, high population density, unavailability of potable water and low health status, provide optimum conditions for the growth and transmission of intestinal parasites. The prevalence of infections varies in different parts of the world. The prevalence of *Entamoebahistolytica*, for example, ranges from 5% to 81% and is estimated to involve around 480 million people worldwide. *Giardia lamblia* is the most common intestinal parasite in the United States. Of the 3% to 7% of the population with *G. lamblia*in Australia, 1.6% were asymptomatic. In a study in China, *Enterobiusvermicularis* (47.0%), *Trichuristrichiura* (18.8%) and *Taeniasaginata* (17.2%) were the most frequent causes of intestinal parasitic infections. Studies have shown that the prevalence of intestinal parasitic infection is higher in younger people, especially children [5]. For example, an extensive survey in Malaysia reported the overall prevalence of intestinal parasitic infections as 39.6% with as many as 89.0% in children between the ages of 2 and 12 years. Geographical conditions and poor nutritional and socioeconomic status contribute for making the Islamic Republic of Iran a favourable area for parasitic infections. A review of 300 cases of intestinal parasitic infection showed that *A. lumbricoides* was the most common nematode and *G. lamblia* and *E. histolytica* the most common unicellular microorganisms causing intestinal parasitic infections (A.A. Sayyari, *et al*. 2005).

Seven species of protozoan were found in the fecal samples, indicating the contamination of drinking water and poor hygiene among the children in Thailand. The most common species was *Entamoeba coli* (25.8%) a non-pathogenic protozoal. Other non-pathogenic species, listed according to their frequency of occurrence, were: *Endolimax nana* (2.5%), *Chilomastixmesnili* (0.3%) and *Iodamoebabütschlii* (0.1%). Three pathogenic species were found: *Giardia lamblia* (5.3%), *Entamoebahistolytica* (1.4%), and *Blastocystishominis* (0.8%), all of which may cause diarrhea; moreover *E. histolytica* can invade organs and cause amebic abscesses in the liver and brain(J Waikagul1 *et al*. (2002).

A study on the the prevalence of parasites among the patients in Qina Province, Egypt. It showed that the infection of the parasite *Entamoebahistolytica*in 135 patients in the rate of 90% and the parasite *Girdialambilia*affected 60 of the patients in the rate of 40%. Mohey El-Din Z. Abd El-Latif, (2019).

Different intestinal parasites, whether intestinal protozoa, such as *EntamoebaHistolytica* and *Giardia lamblia*, or *Ascaris*sp. or *Taenia* sp. are considered the most widespread parasites on the world level in general and in the third world in particular, as their spread is not related to the Vector hosts, Environmental conditions such as high temperature and excess humidity, in addition to poor economic and social conditions such as poverty, lack of clean water supply and low level of health services increase the prevalence of intestinal parasites and reduce the chances of controling them or eliminate diseases that cause (Dieng*et al*., 1999).

According to the World Health Organization (WHO), the incidence of amoebic dysentery varies from 5% of the population in developed industrialized countries to areas

with good health conditions, reaching more than 60%, especially in children in some tropical regions and poor countries with severe in clean water and apparent lack of health services (Dieng*et al*., 1999). The total number of patients with amoebic dysentery is about half a billion people in the world concentrated in the Third World (Thompson, et al., 1990 & 2001).

Several studies have shown that most people with intestinal parasites are children or Adults, a study in Malaysia showed that intestinal parasites were present in at least 39% of patients aged from 2 to 12 years, accounting for 89% of the patients (Lervy et et. al., 1998).

Intestinal parasites affect approximately 3.5 billion people worldwide and are a public health problem, especially in developing countries, where almost one-third of the population live in conditions favorable to their dissemination.Amebiasis is the second most frequent parasitic disease, causing around 100,000 deaths each year and contributing towards the high global burden of diarrhea, notably in regions with low economic development and settings with poor sanitation (Juliana de Oliveira Costa *et al*, 2018)**.**

*Enterobiusvermicularis* has a worldwide distribution and is one of the most common parasitic helminth infections in the developed world (Cook and Zuma, 2003). It is estimated that 400 million people are infected with diphtheria all over the world (Stephan *et al*. 2006). Appendicitis is the most common acute surgical condition for the abdominal emergency in the Western world, which occurs in 7-12% of the general population (Baert, 1999).

In Nepal, a total of 624 diagnosed cases were identified (1.62%) of patients with clinical diagnosis of appendicitis. *Entamoebavermicularis* was often found in non-flammable and histologically normal supplements (8.45%) of those that were inflamed with histopathological changes of acute appendicitis (0.56%) (Sah and Bhadani, 2006).

Another study was conducted in Iran involving 5048 samples. *E. vermicularis* was found in 144 patients (2.9%) of appendicitis patients (Ramezani and Dehghani, 2007).

In the UK, an evaluation of histological materials obtained from all accessories removed during the past 5 years was carried out at Bristol's Southamid Hospital. *E. vermicularis* was identified in 2.7% of patients with clinical appendicitis (Pod and Armstrong (1987).The simple presence of *E. vermicularis* in the bowel often results in symptoms similar to acute appendicitis, although the mechanism does not include mucus invasion by the parasite (Sah and Bhadani, 2006). While Gutiérrez, (2000) asserts that there is consensus that pinworms do not produce inflammatory response.Burckhart, (2005) mentioned that the infection of pinworm causes the symptoms of appendicitis on the surface.

The prevalence of intestinal parasites was determined for 78patients in KilowaProvince, During the period from the first of March to the 20th of April 2019, in age ranging from1 to 15years old. For fecal samples, microscope was used to identify the presence of parasites and buoyancy techniques. Two types of intestinal parasites were detectedduring this study.

## 2. Materials and Methods

78 clinical samples were collected from patients in the laboratoryofgeneral hospital at KilowaGovernorate, Saudia Arabia.

- These samples have been examined softened by a hyeno-electric microscope.
- This worms were isolated by using float methodand adhesive tape, then loaded onto glass slides and covered with Canada Balsam and dried in the oven.
- The worms samples were photographed by using a camera.

## 3. Results

**Table 1:** The prevalence of parasitic infection of parasites *Entamoebahistolytica*, *Giardia lambilia* and *Enterobiusvermicularis*

| Parasitic infection | *Entamoebahistolytica* | *Giardia lambilia* | *Enterobiusvermicularis* |
|---|---|---|---|
| Repetition | 5 | 0 | 7 |
| The ratio | 6.4 % | 0 % | 9 % |

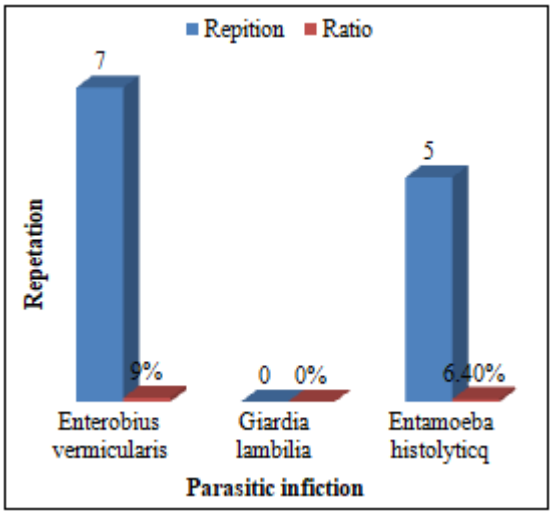


**Figure 1:** The prevalence of parasitic infection of parasites *Entamoebahistolytica, Giardia Lambilia* and *Enterobiusvermicularis*

Table (1) shows the prevalence of parasites among the patients studied. It shows that the infection of the parasite *Entamoebahistolytica*in 5 patients in the rate of 6.4 % and the parasite *Girdialambilia* affected0 of the patients in the rate of0.0% while the infection of the parasite of *Enterobiusvermicularis*was 7 patients in the rate of 9 %.

**Table 2:** The relationship between age and parasitic infection of parasites *Entamoebahistolytica*, *Giardia lambilia* and *Enterobiusvermicularis*

| .The age | *Entamoebahistolytica* | | *Giardia lambilia* | | *Enterobiusvermicularis* | |
|---|---|---|---|---|---|---|
| | Repetition | Ratio | Repetition | Ratio | Repetition | Ratio |
| Less than 10 | 3 | 3.8 % | 0 | 0 % | 5 | 6.4 % |
| From 10 – 15 | 2 | 2.6 % | 0 | 0 % | 2 | 2.6 % |
| Total | 5 | 6.4 % | 0 | 0 % | 7 | 9 % |

Table (2) shows the relationship between the age of the patients in the study and the prevalence and percentage of infection of the parasite *Entamoebahistolytica*, where it shows that the number of infection in this parasite at the age less than 10 years 3 cases, with percentage 3.8 %. At the age of 10 to 15 years, the incidence was 2, with percentage 2.6 %.

Table (2) shows the relationship between the age of the studied patients and the prevalence rate and percentage of the infection of the parasite *Girdialambilia*, where the number of infection with this parasite was zero with percentage 0.0 %.

Table (2) shows the relationship between the age of the patients and the prevalence and percentage of infection of the parasite *Enterobiusvermicularis*, where it shows that the number of infection in this parasite at the age less than 10 years 5 cases, with percentage 6.4 %, while at the age of 10 to 15 years, the incidence was 2, with percentage 2.6 %.

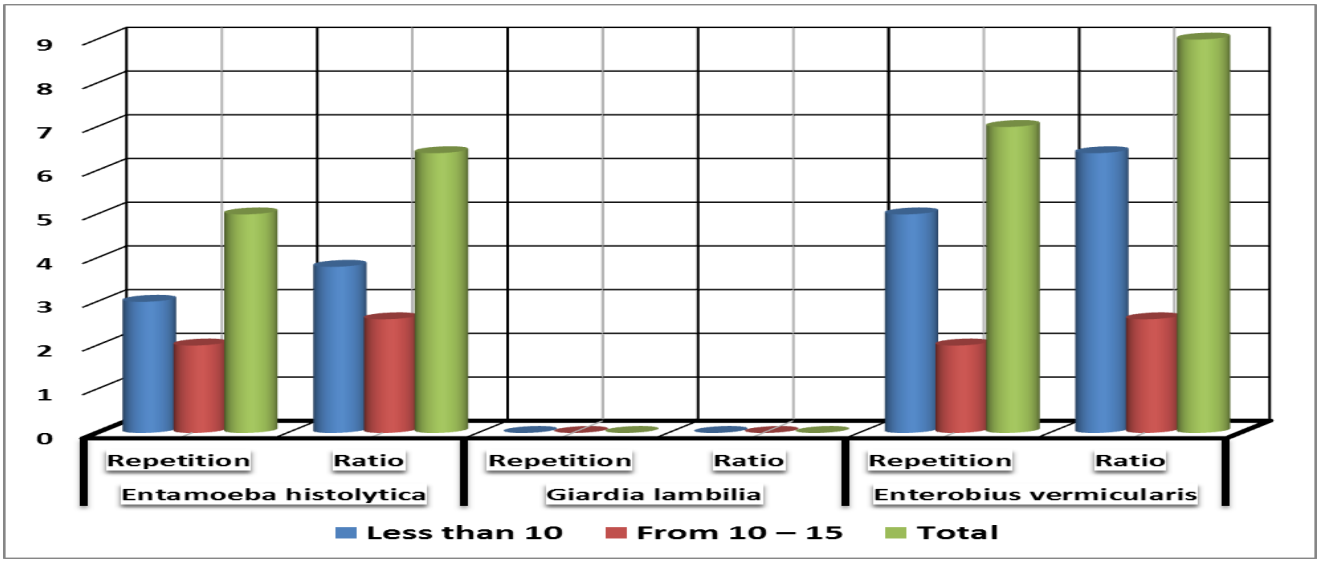


**Figure 2:** The relationship between age and parasitic infection of parasites*Entamoebahistolytica*, *Giardia lambilia* and *Enterobiusvermicularis.*

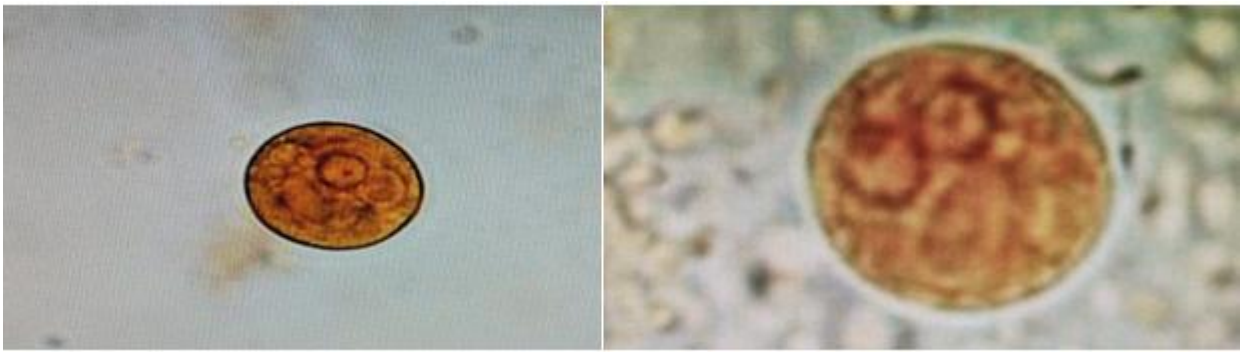

**Figure 3:** Photo of *Entamoebahistolytica*(trophozoite

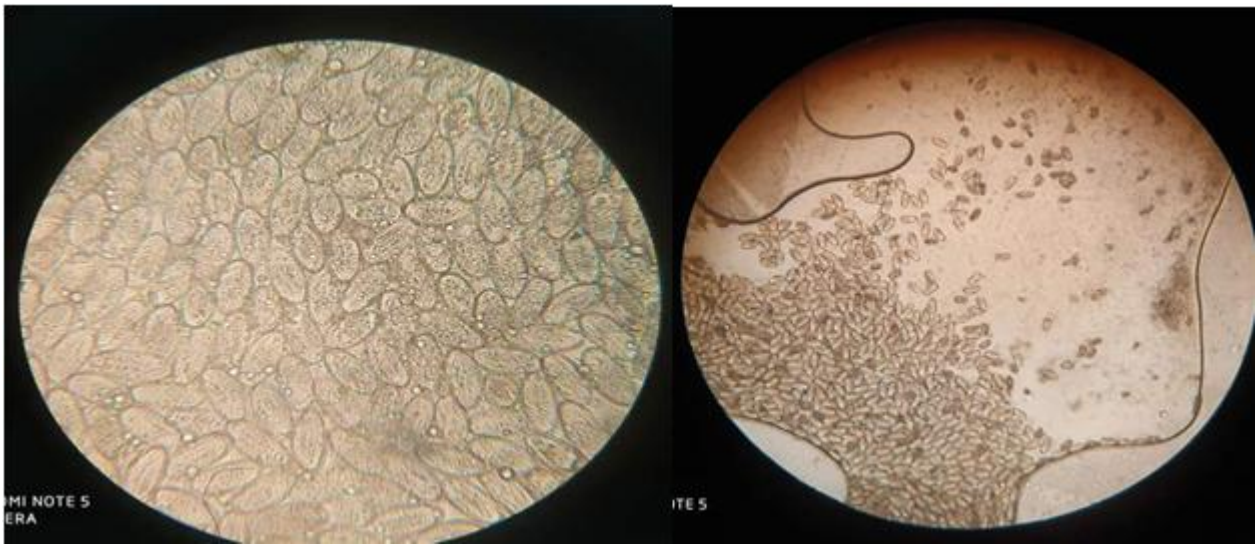

**Figure 4:** Photo of the *Enterobiusvermicularis* (eggs)

## 4. Discussion

This study shows that intestinal parasitic infections are one of the most important health problems facing the populationin Kilowa Province, Saudia Arabia. The findings of studies performed in other countries such as Brazil, China, Egypt and Pakistan are comparable to the results of this study. In 1983, in the United States of America, *G. lamblia* was identified as the cause of 68% of waterborne outbreaks of diarrhoea in which an etiologic agent was unknown. We found that intestinal parasitic infections are more common in rural than urban areas. People living in rural areas may lack sanitary water supplies and live close to sources of parasites in social and environmental conditions that predispose to intestinal parasitic infections. According to this study, the common intestinal parasitic infections were more frequent in children, which suggests that screening tests for this age group may be useful. Because the prevalence of parasitic infections is high in developing countries, it11, No 3, 2005 is suggested that local or regional researchers undertake studies on such infections in these countries, perhaps with the technical support of the World Health Organization.

The results of the current study show that the incidence of infection varies from one parasite to another and that the most common disease among the patients is the parasite *Enterobiusvermicularis*, where the incidence of about 9% compared with *Entamoebahistolytica* parasite, where the rate of infection was about 6.4 %. These results are higher than the results obtained by (Rayan*et al.*, 2010) in their study of intestinal parasites in Australia (4.2%) for the group of children ages 5 to 11 years. (Al-Harthe*et al.*, 2004) in their study of the prevalence of intestinal parasites among school children between the ages of 7 to 12 years in Mecca, Saudi Arabia, where the percentage of infection with *Entamoebahistolytica* 1.01%, and this study differs from the results of (Al-Fahdawy, 2007) where he confirmed that the most common parasites is *Entamoebahistolytica* by 26.4%.

These results are lesser than that obtained by (Moheyeldeen Z. Abdellatif, 2019) in his study on intestinal parasites *Entamoebahistolytica and Giardia lambilia*in Qina, Egypt (90 % and 40 %) respectively, for the group of patients aged from1 to more than50 years. (Al-Harthe*et al.*, 2004) in their study of the prevalence of intestinal parasites among school children between the ages of 7 to 12 years in. The cause of the spread of parasitic infection is transmitted directly through contaminated food and water, as well as lack of attention to personal hygiene and the spread of pollutants in food and drinking water.The infection rate was 61.21% and higher than recorded by (Al-Issa*et al.*, 1986), where the infection rate was 21.5%.

The study showed that the highest incidence of *Entamoebahistolytica* and *Enterobiusvermicularis* were in the patients less than 10 years, i.e, children and school students, due to the lack of health awareness and lack of understanding of the risk of such parasites and the possibility of transmission of infection between Children and schoolchildren during play and low immunity. This study showed a decrease in the prevalence of parasitic infection in the community of Kilowa, Saudi Arabia compared to other developing countries due to the presence of comprehensive health care and treatment and medicine free of charge for all members of the community and the existence of periodic health follow-up on schoolchildren in all stages and the existence of an excellent sewage network in Maintain and maintain permanent control over the sources of drinking water and food

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