

Investigation of *Giardia lamblia* in Maysan province and study of some factors affecting the spread of parasite

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Abstract:

This study included the investigation of infections by the parasite *giardialambliareviewers* arrivals and patients are asleep at Sadr General Teaching Hospital during the period from 11/02/2015 until 20/04/2016, through statistical information available in the Statistics Division of the hospital. Where the number of subjects for the year(2015) 511 persons were examined, of whom 138 members is non-infected, and 373 people was infected and percentages stood at (27.05%, 72.99%), respectively.

The highest percentage of cases in males (83.40%), while it was less than in females (64.13%), and the highest percentage infected in the age group (9-11 years) (85.26%), while the lowest proportion was injured in the age group (less than three years) (73.46%).

A higher proportion of infected has reached in the month of July (86.17%), while the lowest percentage of cases in the month of May (61.66%).

But by the nature of the housing area it was the highest rate of injury parasite in rural areas as it was (79.93%)، while the figure was less than in urban areas (61.29%).

:Introduction

Diarrhea is defined as a disease caused by dysfunction in the digestive system caused by life-threatening and non-life factors. The increase in the number of times of defecation with the production of liquid or semi-liquid feces leads to loss of fluids and ions, causing dehydration and blood viscosity (Bhatia & Ichhpujani, 2004). Diarrhea is one of the most serious health problems faced by most of the world, including developing countries, and is an important cause of childhood disease and many of them, especially infants (WHO 1989). The causes of diarrhea are many and varied, including parasitic, bacterial or diet, Al, 2002). Or diarrhea may be the result of an imbalance between intestinal absorption and secretion or an imbalance in the individual's nutrition in the absence of any gastrointestinal cause (Gueerant, 1986).

One of the most frequent symptoms of diarrhea is malabsorption, which leads to iron deficiency in the infection of the infected parasite called *Giardia lamblia* and *Entamoeba histolytica* as well as the infection of bacteria and viruses, all leading to sudden absorption of bad and damage to villi lining the intestines and poor absorption of proteins and carbohydrates and fats And calcium and vitamins in the ileum and fasting regions (Shah, 2002)..(

The parasite *Giardia lamblia* one serious t that affects young adults and leads to poor absorption, weight loss, where adheres developed vegetative inner lining of the gut, causing atrophy of the intestinal villi and loss of digestive enzymes and thus a poor absorption of food covered by the individual, leading to weight loss syndrome, causes this parasite flatness or lack of villi in cases of severe injury, which impairs the ability of absorption, causing diarrhea occurrence of liposomal (Brien, 1981), and the injured man diarrhea either by direct contact or through contaminated food and water and eating food contaminated with human excrement and Alehio Nat-bearing pathological factors and the use of waste is treated chemically for the

purposes of fertilization as well as the use of non-potable water (Lins& Silva, 2000)

Aims of the study:

Because of the importance of intestinal parasites and their relationship to public health and its association with many diseases such as poor digestion, diarrhea, malnutrition and lack of studies conducted in the province of Maysan, the current study aimed at:

- 1- An epidemiological study was conducted to investigate the infection of *Giardia lamblia* parasites for patients in the General Hospital of Al-Sadr General Hospital in Maysan Governorate and to determine the total percentage of the infected and non-infected with this parasite.
- 2- Study of the effect of sex, age, area of residence, months of the year and its relationship with *Giardia lamblia*.

Lecturer review:

:Historical background

Giardia lamblia is a microbial, whip, single-cell, eukaryotic organism that causes diarrhea all over the world, in two phases, the Cyst and the Trophozoite in its life cycle (Minvielle et al., 2008). The scientist Van Levenhoek was 331 years old when he was examined for his lens under a single-lens microscope and after about 20 years he was given a name for the organism (Ford, 2005).

Lambl is the first to isolate *Giardia* from the feces of children suffering from diarrhea in 1859 and put it under the name *Cercomonas intestinalis*. In 1882, Kanstler isolated the *Giardia* parasite from the small frogs and placed it under the name *Giardia agilis* in recognition of Professor Alfred Giard (Lebbad, 2010). In 1888, the researcher Raphael Antatole Emile named *Lamblia intestinalis* on the parasite. The double label *Giardia lamblia* was developed by Stiles in 1915 to commemorate the French scientist Giard and the world Lambl of Paraguay (Ankarklev, 2012). (

Taxonomy of Parasite:

Giardia lamblia is classified as Hill (2001):

Phylum : Protozo

Sub phylum : Sarcomastigophora

Super class : Mastigophora

Class : Zoomastigophora

Order : Diplomonadida

Family : Hexamitidae

Genus : *Giardia*

Species : *Giardia lamblia*

:General morphological description

Giardia lamblia is a two-phase or two-stage Trophozoite and a Cyst (Espelageet *al.*, 2010). These two phases are available in the small intestine of the infected host (Wang *et al.*, 2007).

Trophozoite:

The vegetative phase is shaped as a pear shaped 20 to 9 micrometer and between 7 - 15 micrometer and thickness 4-2 micrometer (Espelageet *al.*, 2010). The symmetrical side is similar to the tennis racket, which is characterized by a round, The surface of the dorsal surface is convex and the ventral surface is concave, and its front part contains two relatively large nuclei. The nucleus contains a large, central nuclear body (Al-Hadithi and Awad, 2000)

Axostyles are located along the body of the parasite (giving it hardness), and in the ventral side of the parasite are absorbent, oval-shaped sucking disk or adhesive discs that occupy about three-quarters of the parasite's body and are used for adhesion of the mucous membrane of the intestines and to resist the movement of the bowel

intestine (Mullan and Mero, 1990). Behind the absorbent tablets are two central particles, characteristic of the genus *Giardia* (Olsen, 1974)

Giardia has four pairs of flagella, a pair of front and a pair of pairs, and a pair of four pairs of Kintosome, which is located in the front of the nucleus, so that all the Flagellaspas through the cytoplasm for a certain distance before starting freely outside the body (Roberts and Janovy, 2000).

Cyst:

The cyst is circular or elliptical, ranging in length from 15-12 micrometers and its width is between 8-6 micrometers, usually containing four nuclei, as well as the remains of axial pens and the central body (Tashima *et al.*, 2009). The cyst is surrounded by a thick outer wall protected by environmental changes (Chernin , 2000). The cyst represents the contagious phase and can remain active in the environment as it resists temperature, dehydration, and some disinfectants (Akay *et al.*, 2009)

The cysts are placed in large numbers in the stool (Julio *et al.*, 2012), and the cyst lives long under the nails (Said and Hamid, 2010). The parasite is killed if a more normal amount of chlorine or iodine is added (Meyer and Jarroll, 1980). The process of boiling, freezing and dissolving prevents 99% of the bags from turning green (Markell *et al.*, 1986). It was found that parasite bags are not viable after freezing (De Lalla *et al.*, 1992).

Life cycle of the parasite:

Symptoms of the disease appear when eating or drinking water contaminated with the cyst stage of the parasite or through the arrival of part of the faeces of the mouth through the unhealthy practices of some people. The *Giardia* mitochondria can survive for weeks or months in cold water and may therefore be present in polluted wells and water systems, particularly stagnant water sources that occur naturally in

ponds, flowing water storage systems, and even in running water such as falling rivers. Mountains. It can also be found in urban water tanks as well as in treated wastewater, and the teak phase is resistant to traditional chlorine or ozone water purification methods. Garadia can be transmitted from the infected animal to the healthy animal, so it is infected by individuals living in the wild and who swim in contaminated water such as rivers and lakes, especially by the beaver dams, and that is why the popular name of the Giardia "Beaver fever"

In addition to those who suffer as a result of the transfer of water sources or the arrival offaeces to the mouth, workers in health care centers who deal with infected children can also be injured as a result of unhealthy practices in health care centers, as well as affected family members of children. The symptoms of the disease do not appear in all cases of Giardia infections, so many people are infected without knowing it. The parasite's life cycle begins with the cyst stage that comes out with the infected person's stool. The cyst phase is resistant to heat, cold, droughts and other microorganisms. The cyst is characterized by four cores and a shrinking cytoplasm. When the host swallows the cyst, it becomes active and fertilized, and after the feeding phase, the active stage begins the stage of the reproductive reproduction through the two-fold division. This results in active phases and concentric phases that are released outside the gastrointestinal tract with stool. The active phase can not resist conditions outside the host body, but the teasing phase is the viable phase outside the host body(CDC,2013).

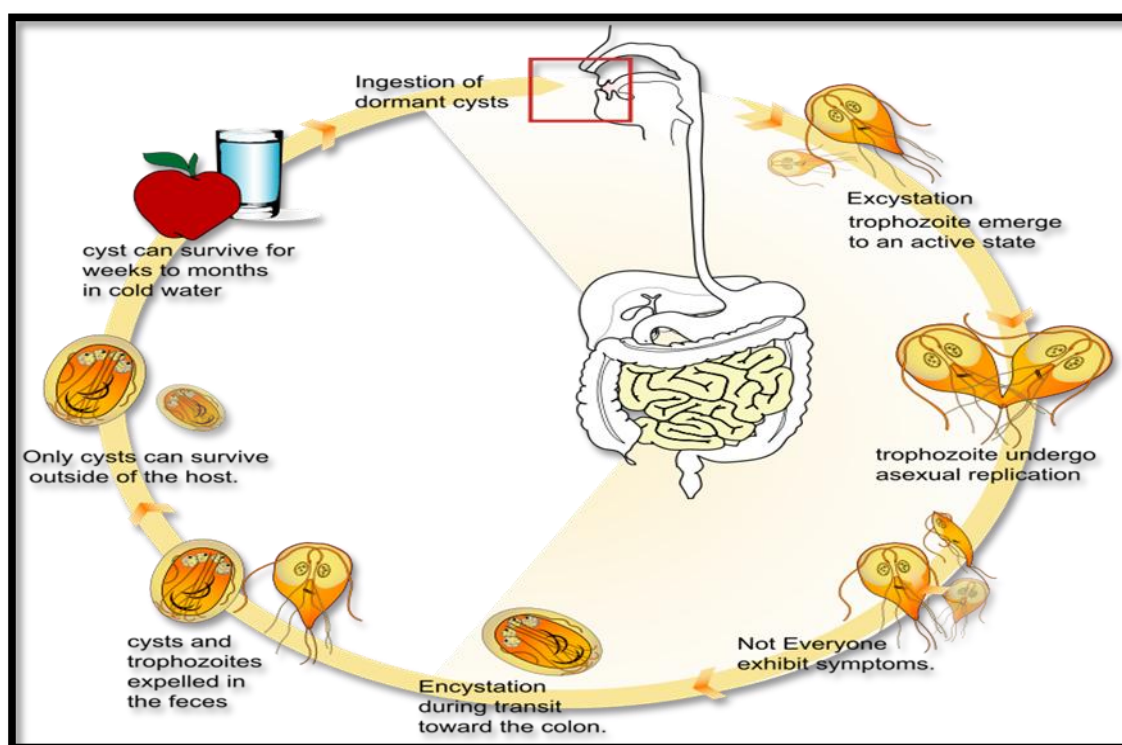


Figure 1 shows a parasite life cycle of *Giardia lamblia*(CDC,2013)

Epidemic parasite *Giardia lamplasia* in Iraq:

A number of studies have been conducted on the spread of intestinal parasites because of the negative effects on human health. (Khafaji, 1999) studied the spread of intestinal parasites among students in some primary schools in Hashimia district in Babil governorate, collecting 3996 faeces samples % as well as the presence of seven species of other intestinal parasites, and held AL-Motaewty (2003) Tharia injuries animal primary parasitic between irritation bowel syndrome and diarrhea in the city of Tikrit in Salahuddin province, where they were examined 116 samples turd the infection rate was infested with 5.7%, In Najaf, Al-Shdud (2002) conducted an epidemiological study The causes of parasitic and appendicitis have fallen asleep patients in two hospitals there, as were examined 500 patients with inflammation of appendicitis Reconstruction ranged from 49-5% a year and the percentage of injury Paljyardia to lamblia 2% as well as the presence of four other types of intestinal parasitesIn a study in Anbar province on the spread of infection of intestinal

parasites and the relationship of infection with some blood components, 2140 samples of faeces and blood were collected from patients who visited four of the hospitals there. The incidence of Giardia lamplasia was 10%, and there were eight other types of intestinal parasites. Hemoclobin, and the formation of white blood cells among people with intestinal parasites and non-infected (Al-Fahdawi, 2002).

Al-Kubaisi (A2003) showed some epidemiological aspects of intestinal parasites among the small age groups in the city of Karbala. 1050 faeces samples were collected for the children of the children's hospitals in Karbala. The parasitic infection was 7.3%. For intestinal parasites in the city of Hilla, where 6085 faeces were collected for eleven health centers and the incidence of Giardia Lamplia 19.3% as well as the presence of nine other types of intestinal parasites.

In a study in the province of Karbala on the spread of intestinal parasites in patients with diarrhea, 1174 samples of faeces were collected from the patients of Al-Husseini Hospital in the province. The infection rate was 17.1% and there were six other types of intestinal parasites (Al-Moussawi 2004). In a study of parasites associated with appendicitis in Diyala, 160 patients with acute appendicitis were examined for both sexes (66 females and 94 males) for ages 3-5 years. The incidence of Giardia lamplasia was 1.3% and two other types of intestinal parasites were recorded (Dulaimi, 2005) .

Diagnosis and treatment:

Many doctors plan to diagnose giardia. The exact diagnosis requires a test (antigen-antigen), but this is not readily available. Oocytes and parasites are detected in the faeces, and many faeces are recommended because parasites and eggs are not constantly present in the sample. Consider the difficult nature of the test, including some negative negative results and some treatments based on experimental evidence and treatments based on disease symptoms

Human infection is traditionally treated with metronidazole, tinidazole or nitazoxanide. Although metronidazole is the first preferred treatment, it is mutagenic in bacteria and carcinogenic in mice, so it should be avoided in pregnancy. Although it has not been directly shown to cause cancers in humans, but in other mammals, it is therefore safe for humans. One of the most common alternative treatments is Berber sulphate(found in the grape roots of Oregon and in yellow bays in the Golden Dam and other plants). Berberine is a substance containing a bio-antifungal and antifreeze. Berber compounds also stimulate the uterus so they should be avoided during pregnancy, and high berberine doses may reduce heart rate and lower blood pressure in some individuals (CDC, 2013).

Materials and Mehtods

Materials

Table (1) shows the materials and equipment used in the current study

Subject Name	Company	Country
Optical Microscope	Novel	Japan
Glass slides	Leitz	Germany
Cover a glass slide	Hirshman	Germany
Wooden sticks	-----	China

Solutions used:

The following solutions were used:

A - Normal solution solution:

Prepare this solution by dissolving 0.9 g of Nacl salt in 100 mL of distilled water (Sood, 1985).

Working methods

: **Study groups:**

A total of 511 patients were examined and examined at Al-Sadr General Educational Hospital in Maysan Governorate to investigate the spread of *G.lamblia* during the period from 1/2/2015 to 31/7/2015. The samples included obtaining the number of individuals examined for 6 months In order to find out about individuals, a questionnaire questionnaire was organized for each individual, which included the following information:

(Date of examination, sex, age, nature of the housing area). The method of isolating parasite from faecal samples was also identified for reviewers in the Laboratory / Parasitology Division..

Methods of examination:

The following tests were performed on stool samplesScreening:

The stool was visually examined prior to the microscopic examination. This examination included a note of the quantity of the stool, its shape, texture and color (Turgeon &Fritsche, 2001)

Microscopic Examination: Direct Mount Method:

In this method a drop of normal saline solution (0.9%) was placed in the center of the glass slide. A small amount of faecal sample was taken as much as the head of a matchstick and from several places of the sample by means of wood stick, and then mixed well with the drop of the solution and the cover slide was placed on the sample. Models were examined using optical microscopy using the X40) objective lens to detect parasite.(

:Statistical Analyses

The computer program (SPSS14) was used to analyze the results statistically.

Results:

Total infection with parasite:

Table (1) shows the numbers of infected and non-infected and percentage of *Giardia lamblia* infections. With 373 infected and 72.99% infected.

Infected		Not infected		Number of examinees
percentage(%)	the number	percentage (%)	the number	
72.99	373	27.05	138	511

Sex Effect:

Table (2) shows the incidence of *G.lambliain* males and females. The percentage of infection among males and females was 83.40% compared to non-infected patients (16.59%). The percentage of infection among females was (64.13%) compared to non-infected women (35.86%).

Table (2) shows the spread of parasite by sex between the sample of the study

Sex	Number of examinees	Infected		Not infected	
		percentage(%)	the number	percentage(%)	the number
Male	235	83.40	196	16.59	39
Female	276	64.13	177	35.86	99

discussion

The study found that the incidence of male infertility is higher than that of females. This may be due to social habits or reasons related to male activity, which increases the chances of exposure to sources of infection more than females. This is in line with the findings of Salman (2002) and Abbasi(2003).

Age Effect:

In the present study, the percentage of *Giardia lamblia* age was calculated. Table (3) shows that the highest rate of infection was in the age group (11-9) years, with 85.26% followed by the age group (3-5) years, with a rate of 83.76% followed by the age groups (14-12) 8-6 years and rates of 82.45% and 74.71%, respectively, while the lowest rate of injury in the age group less than three years and by 73.46%.

Table (3) shows the spread of parasite by age groups between the sample of the study

Age group	Number of examines	infected		Non infected	
		percentag e(%)	Numb er	percent age (%)	Number
< Three years	98	73.46	72	26.53	26
5-3	117	83.76	98	16.23	19
8-6	87	74.71	65	25.28	22
11-9	95	85.26	81	14.73	14
14-12	114	82.45	94	17.54	20

Discussion:

The results of the current study show that children aged 9-11 years are the most vulnerable age group of parasites. This may be due to the presence of these children in overcrowded families with a low standard of living and, on the other hand, The sewage and its continuous blockages and the presence of some barefoot children in the waterways of these waters have helped in a lot of pollution of the hands and needs and clothes of the children of these causes, as well as the presence of children collectively so that there is contact between them, which provides a greater chance of injury.

Effect of months of study:

The results showed the difference in the number and percentage of infection during the months of the study, as shown in Table (4), which show the number of infected Giardia parasites and their proportion by these months. The highest rate of infection in July was 86.17% followed by the rate of infection in June 80.20%, and in May the lowest rate was 61.36%, while the percentage of infection in February and 66.66% and 73.25%, respectively. The month of April was recorded an injury rate of 66.66%.

Table (4) shows the prevalence of parasite by months of the year between the sample of the study

month	Num. of exam .	Infected		Not infected		Of exam. Num
		percentage (%)	Num	percentage (%)	Num	
Feb.	78	66.66	52	33.33	26	78
Mar.	86	73.25	63	26.74	23	86
April	69	66.66	46	33.33	23	69

May	88	61.36	54	38.63	34	88
june		80.20	77	19.79	19	96
july		86.17	81	13.82	13	94

The results of the current study showed that parasitic infection was high during the summer months, the highest in July was 86.17% and in June it was 80.20%, while the lowest rate of parasitic infection in May (61.36)%, and this confirms what reached a lot (2000). The high incidence of parasites in the summer is due to the fact that these parasites are more prevalent in the colder regions (Ichhpujani and Bhatia, 1994) For diseases such as domestic flies, which is a mechanical carrier of the intestinal tract bags and eggs Dan (Hadith, 2000) in addition to the frequent intake of refreshments and cold juices of street vendors, which can be a suitable medium for the spread of parasites.

Impact of the nature of the housing area:

In the present study, the relationship between the nature of the area of residence and the rates of infection recorded was determined based on the area in which the examinee lives and as shown in Table (5). The percentage recorded in rural areas was higher (79.93%) than in urban areas Injury hit 61.29% .

Table (5) shows the spread of intestinal parasites according to the nature of the housing area between the study sample

infected		Non infected		Num	Area type
percentage (%)	Num	(%)	Num		
61.29	122	38.07	75	197	Urban areas
79.93	251	20.06	63	314	Rural areas

The results of the above table indicate that the highest rate of infection was recorded among individuals living in rural areas with 78.82% and the lowest percentage among urban dwellers with an incidence rate of 74.55%. The reason is that rural areas may have health conditions (Caccio et al., 2003). Also, there may be a large number of animals that are the cause of the collection of insects, including flies, which is the best carrier Mechanical bags for props and eggs Worms (Maulan and Miro, 1990). This result was agreed with the following studies: Moussawi (2001) in the city of Karbala, Fahdawi (2002) in the city of Ramadi, Fotouhi and his group (2007) in the province of Nineveh.

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