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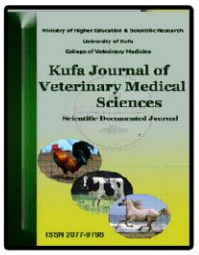
vetmed@uoKufa.edu. iq



Study on prevalences of *Entameoba histolytica & Giardia lamblia* in Samarra city

Assistant lecturer: Maroof S. Juma Al-Ammash
Department of Biology / College of Education / University of Samarraa
Email: ebnbaz51@yahoo.com

Abstract

This study was done during the period from October-2014 to end of March-2015, to study the prevalence of *Entameoba histolytica & Giardia lamblia* among patients with diarrhea. The number of examined samples of feces was 304. These samples taken from patients complain from diarrhea those attending General Hospital of Samarra & some Primary Health Care Centers, at the age of infant to 50 years. These samples examined by Direct wet film preparation (by using Normal saline & Lugol's iodine solution) & Examination of Sedment. The results of existing study as follow:

The percentage of total infection of intestinal parasites during this study showed that the number of males slightly more than females. Nonsignificant differences found among percentage of total infection of intestinal parasites under study, while significant differences found among patients lives in rural & urban area. High prevalence of parasitic infection was occurred in Winter. Significant differences found among percentages of total infection of intestinal parasites in different ages. High significant differences found among the total percentage of parasitic infection according to family numbers, while nonsignificant differences found between two parasites. Significant differences found among the total percentage of parasitic infections according to source of drink water, while nonsignificant differences found between two parasites.

Key words: *Entameoba histolytica, Giardia lamblia,* Epidemiology.

دراسة وبائية لكل من طفيلي اميبا الزحار *Entamoeba histolytica* وجيارديا لامبليا *Giardia lamblia* في قضاء سامراء

م. م. معروف سبتي جمعة العماش
قسم علوم الحياة / كلية التربية / جامعة سامراء.
البريد الاكتروني: ebnbaz51@yahoo.**com**

الخلاصة:

اجريت الدراسة الحالية خلال المدة ما بين شهر تشرين الثاني 2014 ونهاية شهر اذار 2015 للتقصي عن الاصابة بكل من طفيلي اميبا الزحار *Entamoeba histolytica* وجيارديا لامبليا *Giardia lamblia*، بلغ عدد عينات الغائط المفحوصة 304 عينة، اخذت من المرضى المصابين بالاسهال والمراجعين لمستشفى سامراء العام وبعض المراكز الصحية. وللاعمار ما بين بضعة اشهر الى 50 سنة. فُحصت العينات بطريقة المسحة المباشرة (باستعمال المحلول الملحي الفسلجي ومحلول اليود– اللوكالي) وطريقة الترسيب. وتبين من خلال نتائج الدراسة الحالية مايلي:

كانت نسب الاصابة الكلية بالطفيليات المعوية قيد الدراسة في الذكور اعلى قليلا منها في الاناث. لوحظ عدم وجود فروق معنوية بين نسب الاصابة بالطفيليات المعوية قيد الدراسة بينما وجدت فروق معنوية بين المصابين ممن يسكنون المدينة والريف. تبين حصول الاصابة بالطفيليات المعوية قيد الدراسة بمعدل اعلى خلال الاشهر الباردة. تبين وجود فروق معنوية في نسب الاصابة الكلية بالطفيليات المعوية قيد الدراسة عند الفئات العمرية المختلفة. وجود فروق معنوية بدرجة عالية في نسب الاصابة الكلية بالطفيليات المعوية قيد الدراسة وعدد افراد الاسرة، بينما لم يلاحظ وجود فروق معنوية بين الطفيليين. تبين وجود فروق معنوية في نسب الاصابة الكلية بالطفيليات المعوية قيد الدراسة ومصدر ماء الشرب، بينما لم يلاحظ وجود فروق معنوية بين الطفيليين.

كلمات المفتاح: اميبا الزحار، الجيارديا لامبليا، الوبائية.

Introduction

Parasitic infection are widly distributed in tropical & subtropical areas particularly in developing countries [1], because lack of popular hygien bases & involvement of multiple complicated & connected factors such as enviromental factors, host behaviors, genetical factors & immunological response [2].

E. histolytica & *G. lamblia* are from intestinal protozoa the most important cause of human infection, *E. histolytica* infected large bowel & causes ulceration [3]. Amoebic dysentry widly spread in areas that complian from poor health & livelihood conditions particularly in tropical areas [4]. The most morbidity & mortality of infections found in Africa, Asia & middle south America [5], about 500 millions person effected with this parasite every year & about 100000 death case occur's. However about 10% from these cases were symptomatic [4] & the remainder cases were asymptomatic, the infecton differs from country to other, where the Amoebic colitis is more common in Egypt while liver abscess was common in south Africa, the severity of infection depending on strain virulence of *E. histolytica*, type of host, alimental condition of host, host immunity, presence of normal flora in intestine & presence other intestinal infections [6].

The life cycl was direct & transmitted by water & food contamination by mature cyst & excystation occure in the bowel lumen to release trophozoites, that can invade mucosa of the large bowel, the severity of symptoms differs according to site & intensity of ulceration, such as colicy pain & diarrhea & sometime associated with blood & mucos with loss of appetite, nausea, vomiting with weight loss, general debilitation, loss of electrolytes & mineral of the body due to diarrhea such as sodium, potassium, intestinal protozoa considered the one of important causes for malnutrition & anemia [7,8].

Giardiasis consider as zoonotic diseases caused by *Giardia* spp [9,10]. *G. lamblia* one from the flagellates protozoan that infected the small intestine (duodenum & jejunum) of human,

G. lamblia has direct life cycl [11], included it as trophozoite & cyst & consider as apathogenic agent, cause diarrhea to human, & the infection spread in throughout world [12,13,14].

Clinical features of with infection with *G. lamblia* vary from symptomatic to asymptomatic & different according to strain of parasite & immunological response of the host [15,16].

The most evident clinical features associated with the disease are steatorrhea, cramp, nausea, loss of appetite & loss of weight [17]. Giardiasis may be lead to diarrhea & malabsorption syndrome & delay in milestones of children [18,19].

Giardiasis occurs after ingestion of cyst of *G. lamblia* during 1-3 weeks [20,21]. Infection causes damage of the

mucosa of intestine due to the parasite has sucking disc which adherent to intestinal mucosa & other means that cause damage to villi which lead to decrease in absorption of food & minerals [18,21].

Diarrhea is an important healthy problem in the world & one of causes that lead's to Morbidity & Mortality of children, particularly in developing countries, it subscribe extremely in Malnutrition, & it lead to disease & lose of working hours in adult & adolescent in many countries [22].

Diarrhea cause 50 millions death person each year throughout the world & 80% from death in infants due to diarrhea particularly less than 2 year from age [23].

Diarrhea defined as increase in time of motion to more than three time per day with increase in liquidity of feces [22], while Palmer *et al.* [24], defined diarrhea as increase in weight of feces> 200gm/day.

Diarrhea may still 14 days which called acute diarrhea or it persist more than 14 days so called chronic diarrhea [23].

Many studies done about prevalence of intestinal parasites in patient complianing from diarrhea in the world, Arabic countries & Iraq, for health important of diarrhea so this study aim to study prevalence of some intestinal parasite infections among patients complaining from diarrhea in Samarra town & know effect of age & sex of patients, family persons number, source of used water & residence site on type & percentage of infection with these parasites.

Materials and Methods

The samples of this study was collected from beginning of November/2014 – end of March/ 2015. fecal samples three hundred and four examined taken from infected patients with diarrhea & visitors of general hospital of Samarra & some primary health care centers.

Present study included the patients who complian from diarrhea, so regulate sheet of questionnaire specific to each patient include the follow information;

1- Patient name
2- Age & sex of patient
3- Family persons number of patient
4- Source of used water
5- Residence site (urban or rural).

The fecal samples collected (one sample for each patient) in clean & dry plastic cap with wide opening & tight cover to prevent drying of sample & avoid contaminate it with urine that kill trophozoites in fecal samples [25].

The samples examined in parasitology lab. in hospital immediately because delay of sample examine lead to trophozoites disappear particularly in acute dysentery, that cause difficultly in distinguish it [26].

preparation of Solutions

1- Normal saline

It prepared according to WHO [27].

2- Lugol's iodine stain solution

It prepared according to WHO [28].

Investigation of stool samples:

1- **Macroscopic Examination**

The inspection of stool samples involve examination of the amount of feces, form it, Consistency & color it. In liquid or soft samples often trophozoites appear, while cystic phases appear in semisoft samples [29]. Feces may be contain blood or mucus, so should examine these parts separately & carefully because it may contain trophozoites of *E. histolytica* [30], & in state of reach more than one sample to the lab. at same time, the more liquid & mucus sample examined firstly [31].

2- **Microscopic Examination**

2-1 **Direct wet film preparation**

The fecal samples taken from patients suffer from diarrhea & examined according to direct wet film preparation by using normal saline & Lugol's iodine stain solution [28].

2-2 **Concentration Method**

Using this method for concentration of parasitic factors existing because of numbers low in samples, when examining result of direct wet film preparation was negative, used in present study examination of sediment according to WHO [28].

Statistical analysis of data was performed using t test (except of table 2 was performed using f test) to detect statistical differences in relation of different parasitic infections [32].

Results and Discussion

Table (1) shows the relation between infection with intestinal parasites under study & sex, where found the rate of infection in male slightly more than female. The numbers of infected male 26 & 35 cases (53.06% & 63.64% respectively) in contrast with female 20 & 23 cases (36.36% & 46.94% respectively) for each *E. histolytica* & *G. lamblia* respectively, this results agreed with several studies such as AL-Kllaby [33], AL-Mashhadani [34], Salman [35] which pointed out that there is an increase in number of male suffer from diarrhea than female. The cause of increase in male infected rate belong to whose visits out clinic & inpatient in the hospital in contrast with number of female & may be due to social habit role in this, such as more care to males than females or due to the males effective more & contact with out environment than females [36].

No-significant differences observed in total infection rate with intestinal parasites between males & females whose visitors of general hospital of Samarra & some primary health care centers (table 1), because of presence of same opportunity perhaps to infected of both sex with intestinal parasites, this result was agreed with Al-Magdi [37], Al-Izzi [38] & Salman [35].While in the relation between infected persons with intestinal parasites & age (table 2) the result of existing study pointed out that there is a highest percentage of infection with each *E. histolytica* & *G. lamblia* at age of 6-13 years (45.56%), & lowest percentage of infection at age less than a year (22.5%). A significant difference shows in the infection of different ages under study. Increase in average of total infection at age 6-13 years may be belong to multiple causes such as lack of popular hygiene bases & whose more active at this age & less them cure about self hygiene with popular playing of persons outside the house & pick up some toys and other things and put it inside the mouth, in addition to some bad habits, such as put a fingers in the mouth, & kids interdiction to take treatment, all these factors may be make them more susceptible to intestinal parasitic infections [39].

The results (table 3) show the highest recorded rate of total infection among individuals who live in urban area (41.3%) & rate lowest in rural area (27.3%), the nature of rural life (as defecation in exposed area, drink of water from un hygiene sources as river or stream, contact with animals as well as use of their untreated droppings for to fertilize vegetables) increase opportunity infection. While the high of infection percentage in urban people may be due to migration of rural

people to urban & over crowding with no spread of health consciousness & people most immigrant from rural to urban may be live in places not dependent it to popular hygiene bases due to prevalence of certain habits and unhealthy behaviors like, defecation in exposed area, drink of water from un hygiene sources as river or stream in addition to aducation low of the family (Special mother) [39].

Statistical analysis (t-test) showed that no-significant differences among infection rates to each *E. histolytica* & *G. lamblia*, While we found significant differences among the infected, who live in urban & rural. This results not agreed with results of Al-Dujaili [40] & AL-Fahdawi [41]. Who pointed out that the rates of infection in rural area were higher than urban area. It observed also infection percentage with *E. histolytica* (Whether the people who live in urban or rural) were higher than *G. lamblia*.

The results (table 4) show infection rates with each parasites *E. histolytica* & *G. lamblia* according to study period (months), the percentage of total infection in January (54.1%) was higher than other months of this study, while was lowest in March (16.9%). This study showed significant differences in infection percentage according to months of year (table 4) & no-significant differences between parasites both under study. The reason in high percentage of infection in January may be attributable to high humidity & low temperature which cysts help to life for long period & thus be biggest infection chance with it, while low percentage of infection in March may be attributable to high temperature which kill of trophozoites directly, as well as inability of cysts to resistant of high temperatures for than 3 days [36].

Table (5) shows the relation between infection rates with intestinal parasites under study & family size of infected persons in this parasites, where increase percentage intestinal parasites under study with increase in number of family persons, so recorded of results high percentage of total infection (64.5%) among people who family them size 12-14 person & low percentage (12.5%) among people who family them size 3-5 person. It observed during statistical analysis high significant differences in relation between the percentage of total infection with intestinal parasites & family size, while no-significant differences between two parasites. High percentage of total infection in suffer patients from diarrhea who lives within a big family in number may be attributable to transmission easily of infection by direct contact between individuals & using of tools in the house (towels, bed clothes, covers & shaving tools … ect), this result was agreed with Al-Dujaili [40] & Salman [35].

Showed from results of existing study (table 6) presence relation between infection rates with intestinal parasites under study in suffer patients from diarrhea & source of used water for drink, so recorded high percentage of total infection among individuals depended on other sources of water (river, well & tanker trucks) as a source of drink water, reaching (42.6%), while recorded low percentage of total infection among individuals depended on tap water as a source of drink water, so reach (30.5%), pointed out infection rate among patients depended on other sources of water (river, well & tanker trucks) as a source of drink water to contamination of these source by various natural & industrial pollutants,

in addition to family most using the water without boiling it, this leading to epidemics of diarrheal diseases. The well water is

Investigate Number	Causative agent	Infected Number	Number of Male	Infection Percentage (%)	Number of Female	Infection percentage (%)
304	***E. histolytica***	55	35	63.64	20	36.36
	G. lamblia	49	26	53.06	23	46.94

usually sterile as it passes through multiple layers of ground, that work as filter of water from microorganisms & other material susceptible to filtration, nevertheless may be exposed to contamination by many pollutants or may by feces. The well water consider also source of spread microorganisms (Cholera & Typhoid fever) in addition to subject of our study as *E. histolytica* & *G. lamblia*, because of the well used are exposed, opened & near from river. The infection rate of persons who use tap water as drink water may indicated to deterioration of filter networks of waters, in addition to sterilizers & disinfectants decrease which added to water for sterilization because of the deteriorating of security situations. These results agreed with said each AL-Jebori [42] & AL-Nasiry [43].

Table(1): Distribution of patients according to causative agent.
Calculated of t value=1.9, table of t value= 6.31

Table(2): Distribution of infection with *E. histolytica & G. lamblia* according to age & sex.

age (Year)	Investigate Number	Infected		*E. histolytica*				*G. lamblia*			
				Male		female		Male		female	
		Infected Number	Infection percentage (%)	Infected Number	Infection percentage (%)	Infected Number	Infection percentage (%)	Infected Number	Infection percentage (%)	Infected Number	Infection percentage (%)
year >	40	9	22.50	3±0.47 Ca	33.33	1±0.47 Ba	11.11	3±0.47 Ba	33.33	2±0.47 Ca	22.22
5 -1	28	11	39.29	1±1.03 Cb	9.09	1±1.03 Bb	9.09	4±1.03 Ba	36.36	5±1.03 ABCa	45.45
13-6	90	41	45.56	17±1.48	41.46	8±1.48 Ab	19.51	9±1.48 Ab	21.95	7±1.48 Ab	17.07

				Aa							
20-14	70	24	34.29	6±1.07 BCab	25.00	7±1.07 Aa	29.17	4±1.07 Bb	16.67	6±1.07 ABab	25.00
50-21	76	19	25.00	8±0.93 Ba	42.11	3±0.93 Bb	15.79	6±0.93 ABa	31.58	3±0.93 BCb	15.79
Total	**304**	104	34.21	35	33.65	20	19.23	26	25.0	23	22.12

Similar letters show no-significant differences ($p > 0.05$) among groups.
Different letters show significant differences ($p \leq 0.05$) among groups.
Large letters show comparison among one column groups.
Small letters show comparison among one row groups.

Table(3): Distribution of infections with intestinal parasites among diarrheal patients according to live site.

Residence site	**Investigate Number**	**Infected Number**	**Infection Percentage (%)**	***E. histolytica***		***G. lamblia***	
				Infected Number	**Infection Percentage (%)**	**Infected Number**	**Infection Percentage (%)**
Urban	150	62	41.3	32	51.6	30	48.4
Rural	154	42	27.3	23	54.8	19	45.2
Total	304	104	34.2	55	52.9	49	47.1

Calculated of t value=0.42, table of t value= 6.31

Table(4): Distribution of infections with intestinal parasites throughout study months.

Month	**Investigate Number**	**Infected Number**	**Infection Percentage (%)**	***E. histolytica***		***G. lamblia***	
				Infected Number	**Infection Percentage (%)**	**Infected Number**	**Infection Percentage (%)**
November2014	60	14	23.3	5	35.7	9	64.3
December	58	24	41.4	9	37.5	15	62.5
January 2015	61	33	54.1	20	60.6	13	39.4

Februar y	54	21	38.9	13	61.9	8	38.1
March	71	12	16.9	8	66.7	4	33.3
Total	304	104	34.2	55	52.9	49	47.1

Calculated of t value=0.37, table of t value= 2.1

Table(5): Distribution of infections with intestinal parasites among diarrheal patients according to persons number of family them.

Number of family persons	**Investig ate Number**	**Infected Number**	**Infectio n Percent age (%)**	***E. histolytica***		***G. lamblia***	
				Infected Number	**Infectio n Percent age (%)**	**Infected Number**	**Infectio n Percent age (%)**
5-3	120	15	12.5	11	73.3	4	26.7
8-6	130	57	43.8	26	45.6	31	54.4
11-9	23	12	52.2	7	58.3	5	41.7
14-12	31	20	64.5	11	55.0	9	45.0
Total	304	104	34.2	55	52.9	49	47.1

Calculated of t value=0.2, table of t value= 2.35

Table(6): Distribution of infections with intestinal parasites among diarrheal patients according to source of used water.

Source of used water	**Investiga te Number**	**Infected Number**	**Infection Percenta ge (%)**	***E. histolytica***		***G. lamblia***	
				Infected Number	**Infection Percenta ge (%)**	**Infected Number**	**Infection Percenta ge (%)**
Filtering water	210	64	30.5	34	53.1	30	46.9
Other sources of water	94	40	42.6	21	52.5	19	47.5

Total	304	104	34.2	55	52.9	49	47.1

Calculated of t value=0.35, table of t value= 6.31

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