Prevalence of Intestinal Parasites Among Rural Population in Babylon Province

Ahmed M. Al-Moussawi
College of Dentistry, University of Babylon

Abstract

An epidemiological study was conducted during the period from May 2002 till February 2003 to investigate of the prevalence of intestinal parasites among population at Al-Doullab village (Hilla city rural) Babylon province . A total of 681 faecal samples from different ages were examined. There are many intestinal parasites were detected such as (10.5% for *Entamoeba coli* , 10.1% for *E. histolytica* , 8.9 % for *Iodamoeba butchlii*, 7.2% for *Giardia lamblia* , 2.9 % for *Trichomonas hominis*, 4.1% for *Blastocystis hominis* , 0.8% for *Isospora belli*, 7.6% for *Hymenolepis nana*, 6.0 % for *Enterobius vermicularis*, 2.8 % for *Ascaris lumbricoides* ,1.5% for *Ancylostoma duodenale*). The overall percentage incidence of intestinal parasites infection in this study was 62.7 %.

Introduction

The parasitic infections in people regard as a major problem in the world especially in the communities whom suffering from poor sanitation and low personal hygiene such as primary schools pupils and rural communities. (Garcia & Bruckner, 1993)

Intestinal parasites distributed in various ages equally in both rural and civilian environments where the rural environment provide normal conditions for presence of such infections as general while the civilian environment provide a social conditions for such infections (Hashem *et al*., 1999).

The number of studies deal with the prevalence of intestinal parasites in Iraq is low relatively compared with the percentages of parasite distribution (Hashem *et al*., 1999).

In Iraq there are many epidemiological studies of the parasites infections, we review some of them.

In Naienawa province show the total percentage of the intestinal parasites was (70%) where including (19.5%) *Entamoeba coli* ,(3.11%) *Entamoeba histolytica* , (11.9%)*Giardia lamblia* , (19.5%) *Hymenolepis nana* , (11.8%) *Enterobius vermicularis* , (2.95%) *Ascaris lumbricoides* and (0.6%) *Ancylostoma duodenale* in addition to presence a variation in basic blood component values (hemoglobin amount and eosinophile count) in the infected and non infected individuals (Al-Omar, 1992).

Al-Dulaimi (1996) conclude after his checking of 1086 stool specimens for intestinal parasites detection in Al-Anbar city the total infection was (37.2%) including (9.3%) *E histolytica*, (25.7%) *G lamblia* and (0.5%) *H nana* .

In field study for intestinal parasites infection among Deiala city 6645 stool specimens were tested and reveal the total infection was 29.1% and many intestinal parasites were recorded such as *E histolytica* (13.6%) , *E coli* (1%), *G lamblia*(11.1%), *H nana*(0.6%), *E vermicularis*(1.9%) and *A lumbricoides* (0.2%) (Mawlood *et al*.,1998).

There is another epidemiological study in Hilla City made by Al-Kubaiessy (2000) where investigated 4537 patients who visited two hospitals (Babil for childbirth and children hospital and Marjan Specialist hospital) and he found the total parasitic infection was 47.1% including *E coli* (10.9%), *E histolytica* (10.3%), *G. lamblia*(8.3%), *T hominis* (1.4%), *Chilomastix mesnili* (0.9%), *H nana*(2.2%) , *Taenia saginata* (0.06%), *E vermicularis* (10.4%) , *Trichuris trichiura* (1.6%), *A lumbricoides* (0.8%)and *A duodenale* (0.1%).

Materials and Methods

In period from May 2002 till February 2003 a surveillance study was done at Al-Doullab village (Hilla city rural) Babylon province .(681) Stool specimens collected in a clean, water-tight container with a screw –cap lid.

Macroscopic examination of the samples was the first to

determine the consistency and color and the presence of blood and mucus(Zeibig ,1997).

Second examination is microscopically by using direct smear with normal saline (0.9%) and Lugol's Iodine , by using floatation method with saturated salt solution (Zeibig ,1997). Information list provided to each person to collect his name, family number, drinking water, presence of animals and Water-closet in the house.

Chi square test (Campbell, 1967) were employed for the statistical analysis.

Results

The total infection is 62.7 %, the total tested samples is 681and infected samples is 427(table 1). Table (2) show the total infected percent according to parasites among population. The participated intestinal parasitic infection types were listed in table (3). Table (4) illustrated the relationship between intestinal parasitic infection and tested person's age. Significant differences between the infected number and age.

In table (5) there are significant differences between the infected number and family number, the higher infection percent (77.6%) when family number more than 13 and the low infection percent (47.0%) in family number between (3-4).

Table (6) showed the relationship between intestinal parasitic infection and drinking water used in houses, the infection percent increased (81.3%) when using River water. Significant differences were detected in statistical analysis.

The infection percent increased (73.0%) when the Water-closet absent and no hand washing after excrement while decreased (50.6%) in presence of Water-closet and hand washing after use it, we have Significant differences in statistical analysis (table 7). Table (8) reveal the relationship between intestinal parasitic infection and presence or absence of animals in houses, infection percent (66.3%) increased with presence of animals in the houses and decreased (31.4%) in absent it. Significant differences between the infection percent and animals present.

Table (1): The numbers of infected and tested persons and intestinal parasites percentage in at Al-Doullab village .

Region	Tested number	Infected number	Infection percentage %
Al-Doullab village	681	427	62.7

Table (2): The total infected percent according to parasites among population at Al-Doullab village.

Parasite	Infected number	Infection percentage %
Entamoeba coli	72	10.5
Entamoeba histolytica	69	10.1
Iodamoeba butschlii	61	8.9
Giardia lamblia	49	7.2
Trichomonas hominis	20	2.9
Blastocystis hominis	28	4.1
Isospora belli	6	0.8
Hymenolepis nana	52	7.6
Enterobius vermicularis	41	6.0
Ascaris lumbricoides	19	2.8
Ancylostoma duodenale	10	1.5
Summation	**427**	**62.7**

Table (3): The participated intestinal parasitic infection type at Al-Doullab village.

Infection type	Infected number	Infection percentage %
Single infection	175	25.7
Double infection	143	21.0
Multiple infection	109	16.0
Summation	**427**	**62.7**

Table (4): The relationship between intestinal parasitic infection and tested persons age at Al-Doullab village.

Age (year)	Tested number	Infected number	Infection percentage %
1-5	94	65	69.1
6-10	98	74	75.5
11-15	105	66	62.9
16-20	118	78	66.1
21-25	100	59	59.0
26-30	79	46	58.2
More than 30	87	39	44.8
Summation	**681**	**427**	**62.7**
Calculated χ^2		22.28 *	
Tabulated χ^2 (0.01)		12.59	

* Significant differences (P≤ 0.05).

Table (5): The relationship between intestinal parasitic infection and family number at Al-Doullab village.

Family number	Tested number	Infected number	Infection percentage %
3-4	66	31	47.0
5-6	85	46	54.1
7-8	111	63	56.7
9-10	168	104	61.9
11-12	175	124	70.9
More than 13	76	59	77.6
Summation	**681**	**427**	**62.7**
Calculated χ^2		23.61 *	
Tabulated χ^2 (0.01)		15.09	

* Significant differences (P≤ 0.05).

Table (6): The relationship between intestinal parasitic infection and drinking water used in houses at Al-Doullab village.

Drinking water type	Total number		
	Tested number	Infected number	Infection percentage %
Tap water	201	63	31.3
River water	262	213	81.3
Tap + River	218	151	69.3
Summation	**681**	**427**	**62.7**
Calculated χ^2		127.27 *	
Tabulated χ^2 (0.01)		9.21	

* Significant differences (P≤ 0.05).

Table (7): The relationship between intestinal parasitic infection and presence or absence of Water-closet in houses and hand washing or not after using Water-closet at Al-Doullab village.

Present of water-closet in houses and hand washing after using it or not.	Total number		
	Tested number	Infected number	Infection percentage %
Present of water-closet and hand washing after using it.	314	159	50.6
Absent of water-closet and no hand washing after defecating.	367	268	73.0
Summation	**681**	**427**	**62.7**
Calculated χ^2		36.26 *	
Tabulated χ^2 (0.01)		6.63	

* Significant differences (P≤ 0.05).

Table (8): The relationship between intestinal parasitic infection and presence or absence of animals in houses at Al-Doullab village.

Animals presence	Total number		
	Tested number	Infected number	Infection percentage %
Animals present	611	405	66.3
Animals absent	70	22	31.4
Summation	**681**	**427**	**62.7**
Calculated χ^2		32.62 *	
Tabulated χ^2 (0.01)		6.63	

* Significant differences ($P \leq 0.05$).

Discussion

The results showed the total infection with intestinal parasites (62.7%) is high (table 1) because There are many people in rural areas who suffering from parasitic infections due to poor sanitation, poor public health practices, increasing of vectors and malnutrition states in addition to using of river water directly for drinking and washing. In addition to the affect of the economic blockage in Iraq for long period leading to decreasing of drugs and sanitation.

E. coli, I. butchlii, T. hominis are considered non-pathogenic parasites in human , they worldwide distribution and their cysts contaminate food and drinking water then infect human . Detection of these non-pathogenic parasites in human would suggest ingestion of contaminated water or food and may indicate possible exposure to pathogenic organisms (Schmidt & Roberts, 1989; Garcia & Bruckner, 1993; Yilmaz *et al*., 1999; Chin, 2000).

Infection with *E. histolytica* (10.1%) and *G. lamblia* (7.2%) regard as critical infection and worldwide distribution their cysts transmitted through contaminated food and water, hand to mouth contamination. Flies and cockroaches serve as vector for *E. histolytica* infection (Zeibig ,1997). Both *E. histolytica* and *G. lamblia* cysts are resistant to chemical disinfectant such chlorine. *G. lamblia* infection mainly responsible for diarrhea especially in children rather than adults (Zeibig ,1997; Tsuyuoka *et al*., 1999) .

B. hominis infection (4.1%) is initiated by ingestion of fecally contaminated food or water . It causes diarrhea, abdominal pain and fever (Zeibig, 1997).

I. belli infection (0.8%) is worldwide distribution parasite transmitted by oocyst contaminated food or water .it's infection characterized by diarrhea, abdominal pain and eosinophilia (Zeibig, 1997).

The infection with *H. nana* (7.6%) occurs by the presence of rodent or beetles (*Tribolium*) in houses. These worms have different life cycle, it can infect human with or without intermediate host (Schmidt & Roberts, 1989).

E. vermicularis (6.0%) one of the famous children worms infections especially in crowded areas such as schools and orphans . It distributed all over the world (Prince, 1998).

The infection with *A. lumbricoides* (2.8%) is very common in the world. It increased in poor sanitation regions, particularly where human feces is used as a fertilizer and where children defecate directly on the ground (Zeibig, 1997).

Ancylostoma duodenale infection (1.5%) is worldwide distribution particularly in the inhabitants practice poor sanitation practices, especially with regard to proper fecal treatment and disposal. It infect persons who walk barefoot in feces contaminated soil (Al-Mamouri, 2000) .

It is clear from the table (3) that double infection is (21.0%) and multiple infection is (16.0%) because of the highly exposure to the infection sources such as contaminated food or water (Al-Mamouri, 2000).

In small ages (1-5) and (6-10) infection was (69.1%) and (75.5%), alternatively (table 4) due to the high chances for infection in these ages and they not realize the good sanitation in compare with older ages with significant differences (Abass, 1997; Al-Mamouri, 2000).

Also when the family number is high (more than 13) (table 5) the infection is increased (77.6%) in compare with family number (3-4) it's infection percent (47.0%) because of the crowding in houses leading to participation in food tools, clothes and bed finally increasing the infection significantly (Al- Omar, 1992).

In table (6) using of river water for drinking causes increasing of infection significantly (81.3%) due to presence of infective stages in this water from the fecal materials contamination (Al-Mamouri, 2000).

One of the important reasons of increase infection is the absence of water-closet in houses and no hand washing after defecation, table (7) showed high infection (73.0%) due to above reason. So the defecate directly on the ground give a chance for flies and other insects to carry the infective stages then contaminate the water or food. In addition to contaminate

the hands with fecal materials serve as hand to mouth contamination. The statistical analysis reveal significant differences (Abdel Messih *et al*., 1975 ;Al – Kafaji , 1999).

Finally presence of animals in houses plays a role in transmission of infection as shown in table (8) it record infection (66.3%) in the presence of animals. These animals (rodents, cats , dogs , cows , birds and others) carry the infective stages especially rodent regard as intermediate host for example dwarf tape worm (*H. nana*) there is significant differences (Al-Mamouri, 2000 ; Wajihullah,2001).

From these study we conclusion the followings:

1- The total incidence of intestinal parasites infection in this study was 62.7 % .
2- *Entamoeba coli* infection (10.5%) was the highest in current study.
3- The infection increased with increasing of family number.
4- The infection with *Isospora belli* (0.8%) and *Blastocystis hominis* (4.1%) were firstly recorded in Hilla city.
5- The using of river water facilitate the infection transmission and increase it (81.3 %) .

So from above conclusion we recommend the increasing of good personal hygiene and proper sanitation practice in addition to water treatment before drinking (boiling or treating with iodine crystals). Avoiding the use of human feces as fertilizer. Finally protection of food from flies and cockroaches.

References

Abass, E. M. (1997). Epidemiology of intestinal parasites and head lice among some primary schools pupils at Baghdad city. MSc. Thesis, Coll. Education (Ibn Al-Haitham),Baghdad Univ. : 56pp. (In Arabic).

Abdel Messih, G.;Mullah,T. & Tajeldin, H. (1975) . Epidemiology: General principles and application to infectious diseases. Al-Hurriya Printing House, Baghdad: 533 pp.

Al - Dulaimi , S.S. (1996) . Parasitic etiology of diarrhea in Al – Anbar province . Al Mustansiriya J. Sci., 7(2) : 64-68 .

Al – Kafaji, A. H. A. (1999). Prevalence of intestinal parasites and head lice in pupils of some primary schools at Al-Hashemia district,

Babylon province. MSc. Thesis , Sci. Coll. , Babylon Univ. : 119 pp. (In Arabic).

Al - Kubaiessy , A.H.M. (2000) . Study of some epidemiological views of the intestinal parasites in Babylon province / Iraq . MSc. Thesis , Coll. Sci. , Babylon Univ. : 48pp.

Al - Omar , N.S.N.K.(1992) . Study of prevalence of intestinal parasites at some areas in Nainawa province and their effect on hemoglobin level and acidophile numbers . MSc. Thesis , Sci. Coll. , Mosul Univ. : 80pp.

Al – Mamouri, A. K. (2000). Epidemiology of intestinal parasites and head lice in pupils of some primary schools at Al-Mahaweel district, Babylon province. MSc. Thesis , Sci. Coll. , Babylon Univ. : 122pp. (In Arabic).

Campbell, R.C. (1967) Statistics for biologists .Cambridge Univ. Press: 242 pp.

Chin, J. (Ed.). (2000). Control of communicable diseases: Manual, 17th edn., Amer. Public Health Assoc. , Washington: 624 pp.

Garcia, L. S. & Bruckner, D. A. (1993). Diagnostic medical parasitology, 2nd edn. , Amer. Soc. Microbiol., Washington : 764 pp.

Hashem, W. H.;Ali,J.K.& Hiessen, A. M. (1999). Prevalence of intestinal parasites among primary schools pupils at Hilla city. J. Techn./Med.Rech. , 50:17-23. (In Arabic) .

Mawlood , N.A.; Helal, M.A. & Amer,A.V.(1998). Survey of the digestive tract parasites in Diala province population . Ibn Al –Haythum J.for Pure and Appl. Sci. 9(2):1-16.

Prince, A. (1998). Infectious diseases in: Behrman, R. E. & Kliegman, R.M. (Eds.). Nelson essentials of pediatrics, 3rd edn., W.B.Saunders Co., Philadelphia: 315-418.

Schmidt, G. D. & Roberts, L. S. (1989). Foundations of parasitology, 4th edn., Times Mirror / Mosby Coll. Publ., Saint Louis: 750 pp.

Tsuyuoka,R.;Bailey,J.W.;Guimaraes,A.M.; Gurgel, R.Q.&Cuevas, L.E.(1999). Anemia and intestinal parasitic infections in primary school students in Aracaju, Sergipe, Brazil. Cad. Saude Publ. Riode Janeiro, 15(2):413- 421.

Wajihullah, S. MA. (2001). Intestinal parasitic infection in school children of Ujhani, Budaur, India. J. Parasitic Dis., 25(1):9-26.

Yilmaz, H.; Akman,N.&Goz,Y.(1999). Distribution of intestinal parasites in two societies with different Socio – economic status in Van. Eastern, J. Med., 4(1): 16-19.

Zeibig, E. A. (1997). Clinical parasitology: A practical approach. W. B. Saunders Co., Philadelphia: 325 pp.

انتشار الطفيليات المعوية لدى سكان قرية الدولاب ،محافظة بابل

احمد محمد الموسوي

كلية طب الأسنان- جامعة بابل

الخلاصة

تم إجراء دراسة وبائية للمدة من شهر ايار 2002 ولغاية شهر شباط 2003 للتحري عن انتشار الطفيليات المعوية لدى سكان قرية الدولاب (أطراف مدينة الحلة) محافظة بابل . إذ بلغ العدد الكلي لعينات البراز المفحوصة 681 من مختلف الأعمار وتم تسجيل العديد من الطفيليات منها (اميبا القولون بنسبة 10.5% واميبا الزحار بنسبة 10.1% واميبا اليود بنسبة 8.9% والجيارديا اللامبيلية بنسبة 7.2% والمشعرة البشرية بنسبة 2.9% والاروموة البشرية بنسبة 4.1% والايزوسبورا بيلي بنسبة 0.8% والدودة الشريطية القزمة بنسبة 7.6% والدودة الدبوسية بنسبة 6.0% والصفر الخراطيني بنسبة 2.8% والدودة الشصية بنسبة 1.5%). وبلغت نسبة الإصابة الكلية بالطفيليات المعوية في هذه الدراسة 62.7%.