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Study of the prevalence of intestinal parasites among children in Al-Rifai district, northern of Thi- Qar province

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Abstract:

The current study epidemiological performed in Al-Rifai district was carried out to find out the spread of intestinal parasites among children referred the hospital and some civil laboratories in Al-Rifai district in the north of Thi-Qar province, and the sampling and examination phase was separated into two stages: summer for three months (June, July, August) for 2018 years and winter (December, January, February) for 2019 years, A total of (680) stool samples were examined by the direct wet swab using the Normal saline and the Sedimentation technique.

The results showed that the number of infected samples is (298) samples with an infection rate (43.82%), It was noted that the rate of infection of males (46.11%) More than females (41.25%) Four parasitic species were recorded in two groups of parasitic protozoa, which included *Entamoeba histolytica*, which had the highest incidence, and *Giardia lamblia*, where it was (29.11%) percent (12.79%) respectively, the group of parasitic helminthes that included *Enterobius vermicularis*, *Ascaris Lunbricoides* where the ratio (1.47%) was (0.44%) respectively. The results showed that the summer months recorded the highest incidence of intestinal parasites compared with the winter months and according to the methods of direct swab examination and deposition, where the ratio (17.64%) (20.58%) (8.52%) (11.76%) respectively. The results also showed that the age groups (4, 5, 13) years were the most affected by intestinal parasites percent (93%) (100%) (48.90%) (70.86) In respectively, and the rural infection was higher than the city percent (49.44%) (37.50%) respectively.

Keywords: intestinal parasites, children, Al-Rifai district

Introduction:

Intestinal parasites are the most widespread in the world, whether they are protozoa, such as *Entamoeba histolytica*, *Giardia lamblia* or Helminthes as *Ascaris Lunbricoides* and *Enterobius vermicularis*. Where its wide spread is related to climatic and environmental conditions such as heat and high humidity in addition to poor economic and social conditions such as poverty and lack of healthy water and low level of health services increase the spread of parasites and reduce the chances of control or elimination of diseases that cause them, and the importance of intestinal parasites is concentrated in the speed of their spread and

infection with a wide range of populations. especially children in most developing and poor countries because of the ease of infection of most types, which occurs through eating food and drink contaminated with one of the parasite life stages, and this is mostly through contamination of vegetables and water with sewage waste (Diengy *et al.*,2000).

Children are more vulnerable to parasites in general and intestinal parasites in particular for a range of reasons, lack of health awareness, lack of attention to hygiene, and decreased immune response compared to. (Odeunmi *et al.* 2007), .*et al* (Odeunmi adults

adults Diarrhea is a serious disease that results from intestinal parasitic infections, and more than 212 million deaths have been observed from children under the age of 20 years especially in developing countries (Anonymous,1996) and who's epidemiological research in different regions of the world suggests that about 1 billion people are infected with different types of intestinal helminthes ,of which 400 million children are chronically infected such as infection parasite *Ascaris lumbricoides* (WHO,1998).

Diagnosis of parasitic Protozoa requires laboratory stool samples to be tested almost three times and for a number of days to confirm the accuracy of the results, and the best method of diagnosis depends on the type of materials and devices needed for the test and on the experience and efficiency of the person as well as on the short time and cost (Houston.,2006).

The aim of the current study is to find out the prevalence of intestinal parasites in children attending Al-Rifai General Hospital, health centers and private laboratories in Al-Rifai district, north of Thi- Qar Governorate, due to the importance of this topic on the lives and health of children.

Materials and methods:

Stool Collection The study included 680 stool samples from children with diarrhea and some other intestinal disorders referred to al-Rifai General Hospital and some community laboratories in Al-Rifai district, and the sampling and examination phase was separated into two phases: summer for three months (June, July, August) for 2018 and winter (December, January, February)for 2019, from the residents of the city and rural areas and returned all areas where there is healthy water and civilian areas, but those where these sources are not available Rural areas.

The samples were collected using clean, dry plastic containers with a wide, well-covered opening and equipped with a tight propulsion system to prevent dry samples and cups given in serial numbers with the name writing and the date of the sample. The information on all samples was recorded in accordance with a form prepared for this purpose.

Stool Examination

1-Examination by the naked eye:

Examination of feces with the naked eye in the laboratory and attention to consistency, the color and smell of the stool, where watery stool contains many numbers of trophozoite phases and therefore must be examined within 30 minutes of obtaining the eye (Zeibig,1997) in case of more than one sample intended to be examined the samples contained on mucus or blood and then examine the rest of the samples.

2-Microscopic examination

Stool was examined in search of cysts and trophozoites for protozoa and eggs for helminthes in two ways:

A- Direct wet smear method:

Samples were taken and examined in direct wet smear method (WHO,2003) where a drop of saline solution was placed on the middle of a dry and clean glass slide, then mixed with a small amount of feces

using stick and repeated the previous steps but using the solution of iodine instead of the solution of the saline solution and then put the slide cover and then examined the glass under the microscope using the power of enlargement 4X,40X,10X and 100X oil lens (Al-Jadoa & Al- Mayahi, 2007).

B- Sedimentation method:

This method (Al-Hadeithy &Awad, 1986) involves mixing a amount of stool with distill water and then filtered with a piece of gauze, then the liquid is left to deposit for (30) minutes at least and pour the juicer and then add a quantity of distill water again and repeat this process several times until obtaining the filter fluid in a clear color, then take part of the sediment and examine it under the light microscope.

The data were analyzed statistically by SPSS statistical programme version 18, and the comparison between the groups and the relationship were obtained. Apvalue ($P \leq 0.05$) was considered to indicate a statistically significant difference.

Results

1- Types of intestinal parasites and percentage of infection:

The results of the current study showed that children in Rifai district were infected with a number of intestinal parasites, it was found that children are infected with four types of intestinal parasites, two of which belong to parasitic protozoa namely *Giardia lamblia*, *Entamoeba histolytica*, the results showed the percentage of parasites sample of *Entamoeba histolytica* was of (29.11%) with number (198) while *Giardia lamblia* while (12.79%)(87).

As for the incidence of helminthes , the study showed that children were infected with two types of intestinal helminthes, Namely *Ascaris lumbricoides*, *Enterobius vermicularis*, where *Enterobius vermicularis* was found to be the most infected among parasitic helminthes , the number of infected was 10 and the percentage of (1.47%) The *Ascaris lumbricoides* had the lowest infection rate (0.44 %) , where the infection showed only 3 cases as shown in table(1).

Table (1) The number of infected children and the percentage of infection with different types of intestinal parasites

Type of Parasites		The number of positive samples	%
Protozoa	<i>Entamoeba histolytica</i>	١٩٨	٢٩.١١
	<i>Giardia lamblia</i>	٨٧	١٢.٧٩
Helminths	<i>Enterobius vermicularis</i>	١٠	١.٤٧
	<i>Ascaris lumbricoides</i>	٣	٠.٤٤
Total		٢٩٨	٤٣.٨٢

2- Distribution of infection according to gender

Table (2) Show percentage of infection with intestinal parasites, the number of children infected with intestinal parasites was (298) (43.82%) out of a total of 680 children, the highest infected patients found (166) (46.11%) in male and lowest infected patients found (132) (41.25%) in female.

Table (2) Distribution of infection with intestinal parasites according of gender.

Sex	male	female	Total
Examined	360	320	680
Type Parasites			
<i>Entamoeba histolytica</i>	110 30.55%	88 27.5%	198 29.11%
<i>Giardia lamblia</i>	48 13.33%	39 12.18 %	87 12.79%
<i>Enterobius vermicularis</i>	6 1.66 %	4 1.25%	10 1.47%
<i>Ascaris lumbricoides</i>	2 0.55%	1 0.31 %	3 0.44 %
Total infection	166 46.11%	132 41.25%	298 43.82 %

3- Distribution of infection according to age groups:

Table (3) The Distribution of intestinal parasites among children in both sexes is shown according age groups, showing that the highest incidence occurred in the age groups (4, 5, 13) years where (48.93%) (75.00%) (86.95%) respectively The lowest incidence found in the 2-year age group, which was (18.60%) percent.

Table (3) Distribution Incidence of intestinal parasites according to age group

Age years	Examined	The number of positive	%	<i>E.</i> histolytic	%	<i>G.</i> <i>lamblia</i>	%	<i>E.</i> <i>vermicularis</i>	%	<i>A.</i> lumbri coides	%
<1	132	38	28.78	2	5.26	18	13.63	0	0	0	0
1	92	24	26.09	19	20.65	0	0.00	0	0	0	0
2	86	16	18.60	1	11.54	6	6.98	0	0	0	0
3	89	20	22.47	13	14.61	7	7.87	0	0	0	0
4	94	46	48.94	34	36.17	9	9.57	3	3.19	0	0
5	72	54	75.00	33	45.83	18	25.00	2	2.78	1	1.39
13>	110	100	90.91	69	76.67	24	26.67	0	0.00	2	2.22
Total	680	298	43.82	198	29.11	87	12.65	10	1.47	3	0.43

4- Distribution of intestinal parasite according to habitation:

Table (4) recorded the incidence of intestinal parasite according to habitation (Rural, Urban), showing that the highest incidence of intestinal parasites found in the Rural area (49.44%). The lowest infection rate occurred in the Urban (37.50%).

Table (4) The Distribution the infection of intestinal parasite according to habitation.

Area	Examined	The number of positive	%	<i>E.</i> <i>histolytic</i>	%	<i>G.</i> <i>lamblia</i>	%	<i>E.</i> <i>vermicularis</i>	%	<i>A. L.</i> lumbri coides	%
Rural	360	178	49.44	123	34.17	47	13.06	6	1.67	2	0.55
Urban	320	120	37.50	70	21.88	40	12.50	4	1.25	1	0.31
Total	680	298	43.82	198	29.11	87	12.65	10	1.47	3	0.43

5- Infection rate of according to hot and cold months:

Table (5) shows the comparison of the infection rate of according to cold and hot months, which were High in the summer months and in both ways of Examination, (17.64%) (20.58%) In the winter months, it was (8.52%) (11.76%) in the direct wet smear method and Sedimentation method respectively.

Table (5) Distribution of intestinal parasites According to the months of summer and winter and for both methods of examination

Examination method Season		Direct smear method		Sedimentation method	
		male	female	male	Female
Summer months	No	٥٦	٦٤	٦٨	٧٢
	%	٨.٢٣	٩.٤١	١٠.٠٠	١٠.٥٨
	total	١٢٠		١٤٠	
	%	١٧.٦٤		٢٠.٥٨	
Winter Months	No	٣٢	٢٦	٤٤	٣٦
	%	٤.٧٠	٣.٨٢	٦.٤٧	٥.٢٩
	total	٥٨		٨٠	
	%	٨.٥٢		١١.٧٦	
Total	No	٩٧	٩٠	١١٢	١٠٨
	%	١٤.١١	١٢.٠٥	١٦.٤٧	١٥.٨٨

Discussion:

The current study recorded 298 cases of intestinal parasites and 43.82% , in children with diarrhea referred to Al-Rifai General Hospital and civil laboratories in the north of Thi-Qar province, due to the different standard of living and social and the difference in the methods of examination followed with the continued risk of the health situation suffered by children and their families after suffering Iraq from the impact of the economic embargo, which directly affected the health, nutrition and education of children, and Iraq has become suffering from many of the deteriorating security and conditions of the poorest people in the food and drinking water. Food stuff that is given in an unsanitary way and the acute shortage of medicines used to treat parasitic infections and animal husbandry inside the house, which provided the conditions suitable for the growth and reproduction of domestic insects that normally transport cyst parasites, in addition to the presence of contaminated sewage and its constant blockages and the lack of compliance of children with the conditions of personal hygiene and their inability to use proper sanitary baths make them more vulnerable to infection than adults (Abdel-Hafez *et al.*, 1986 : Khaled *et al.*,2010).

The current study achieved the rate of infection more than reached Badawi (2009) in his study conducted in some hospitals in Baghdad province where it reached 21.6 % , but it is lower than recorded Hammadi (2012) in his study on children at Mahmoudiya hospital in Baghdad, which recorded (57. 8%).

The results of the current study showed that children were infected with four types of intestinal parasites, the most common was *Entamoeba histolytica* by 29.11% , then *Giardia lamblia* by 12.79 % and then other parasites in different proportions, It agrees with Hammadi (2012) in his study which showed that *Entamoeba histolytica* is the highest infection by 41% and *Giardia* by 34% and that the cause of the frequent incidence of some parasites only others is due to its direct transmission to humans through eating food and water contaminated with infectious phases and the contribution of flies, which is considered vector of the parasite (Zigbig,1997: Al-Bayati & Al-Hassany,2014), Al-Janabi(2002) stated that the unhealthy methods of giving exposed food cause infection because of exposure to dust and insects.

The current study is agreed with AL-Dulaimi(2007) and found that the parasite *Entamoeba histolytica* recorded 9.3% is a dangerous parasite with a high prevalence in the world, Parasite cysts are characterized by high resistance to chemical sterilizers, such as chlorine, and the method of infection by hands contaminated with the most common parasite cysts (Al-Mamouri,2000)as for the *Giardia lamblia* parasite, the rate of infection reached 8.0%, and this parasite infection is considered one of the most infections and causes of diarrhea in humans compared with another parasite, most cases of infection in children are higher than in adults at a rate of two to three times (Al-Mousawi ,2004).

Enterobius vermicularis in the current study recorded an infection 1 .47% , in another study conducted by Al- Mamouri(2000) the infection rate was 5.2%, as this parasite infection is more frequent in all regions and the infection is not limited to poor communities, but also exists in civilized societies and in young children more than As for adults , while the record *Ascaris lumbricoides* 0.44% and in a study conducted by Al-Dulaimi(2006) recorded 2.5%, as infection with this worm is more refered in villages and rural areas than in cities where the rural environment is available. Vegetables without sterilization or washing, the infection increases, the cause of the infection is *Ascaris lumbricoides* on infection and moving from exit to mouth directly without the need for a medium and these results are agreement with Al-Shuaibi (2000).

The study showed that males are more infected with intestinal parasites than females, The percentage in males 46.11% and in females 41.25% and this is agree with Al-Hali(2005) in his study on children in Karbala province and the reason is due to the natural, social and behavioral environment of children, as males are more active and moving Eating fast food and washing in the river water and different behaviors treated with the environment surrounding them than females make them more vulnerable to biological pathogens (AL-Dulaimi, 2006: Al-Zughebi, 2011 : AL- Bayati & Al-Hassany, 2014).

Al-Dulaimi (2001) found that the rate of infection in males and females was close as it was. 31%, 35.8% for males and 30.3%, 34.9% for females according to the direct examination and focus methods, respectively.

The results of the current study showed the rate of infection during the summer months 17.64%, 20.58%, but in winter recorded 8.52%, 11.76% according to the direct smear methods and Sedimentation methods respectively, and this is agree with a study that showed the infection rate was high in the summer months if it reached 36.7%, 37.6% but in the winter months it reached 24.8% and 33% in the direct way and focus respectively and matches other results in Tikrit (Al-Tikriti *et al.*, 2009) It is worth mentioning that the infection is more frequent in wet weather than dry weather, as it abounds in the warm weather more than the cold weather, so it abounds in tropical and subtropical regions, due to the high incidence in the summer due to the increased effectiveness of the population and their exposure to contaminated sources in this season . In another study by Al-Bayati & Al-Hassany (2014) it was found that July had the highest incidence of intestinal parasites, reaching 131% and then August by 28%, and these results were with Hammadi (2012) the highest incidence during July by 41% and in August by 38% due to high temperatures

during the summer months and conditions suitable for the growth of parasites and infectious phases with the intake of juices and other food contaminated with the infectious phases of parasites.

The results showed that the age group (4, 5, 13) years was the most affected among the age groups and by 48.93%, 75.00%, 86.95%, respectively, and this is agree with Al-Bayati & Al-Hassany (2014) that the ages between 6-4 years and 8-6 years are more infected and by 48.8%, 48.6%, respectively, and the results (AL-Mayahi(2009) in his study on children under 8 years in Diwaniyah city showed that 2-4 years is the highest group with 61.7% infection as the study Al-Taie (2009) showed the 11-20 years age group is the most affected with 32% due to lack of health awareness, lack of attention to the personal hygiene of children and the difference in the age of children due to different general environmental conditions, type of food and standard of living.

It was noted in the study Al-Tikriti *et al* (2009) the highest percentage in 12-7 years at 17.4%, that the incidence of children and school students is higher due to lack of awareness and lack of understanding of the risks of childhood and transmission during play and that low immunity has an important cause of infection (AL. khafaji, 1999: Nahi,1998).

The current study showed that the incidence in rural areas is 49.44% and 37.50% respectively, and agrees with Al-Jadoa & Al-Mayahi (2007) found that the incidence rate in rural areas is higher than the center of Diwaniyah Governorate due to exposure to intestinal parasites more than the city because of the lack of sanitation services, lack of drinking water suitable for human consumption, lack of awareness and hygiene and direct contact with animals and others (Al-Bayati & Al-Hassany ,2014).

That this study took samples of patients coming to the hospital and the community laboratory from members of the community who suffer from neglect for long periods as a result of environmental pollution and health neglect and the lack of medicines spread these intestinal parasites and caused pathological injuries and complications and requires reducing their spread and elimination by conveying a realistic picture to the competent health authorities.

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