

PREVALENCE OF INTESTINAL PARASITES AMONG PATIENTS ATTENDED AZADI TEACHING HOSPITAL IN DUHOK CITY-KURDISTAN REGION / IRAQ

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Background

Intestinal parasitic infections are the most prevalent infections in human among developing countries, and these infections can cause gastro intestinal disorders, abdominal colic, anemia, growth retardation, and other complications such as appendicitis.

Materials and Methods

A retrospective study of five years from 2013-2017 were included, the information were obtained from the records of patients that attended Azadi-Teaching Hospital in Duhok City, Kurdistan Region. The patients were sent to the laboratory department by the physicians for stool examination. The stool samples were examined by direct wet mount smears with normal saline and lughole's iodine techniques.

Results

In the current study out of 3,976 stool samples, 1,196 were positive for one or more of the intestinal parasites of the following intestinal parasites, *Entamoeba histolytica*, *Giardia lamblia*, *Trichomonas hominis*, *Enterobius vermicularis* and *Hymenolypis nana*.

The highest infection rate was detected in males than females which were, 656(54.8%), 540(45.2%), respectively. The most common parasites detected were *E. histolytica*, other parasites are reported at low rates, (28.3%) *G. lamblia* (1.1%), *E. vermicularis* (0.05%) and *H. nana* (0.1%).

Conclusion

The current study indicated that the prevalence of intestinal protozoan parasites was more than helminthes, which is considered as an important public health problem in the human population.

INTRODUCTION

The intestinal parasitic infections remain as serious public health problem worldwide, because of its high occurrence in several countries and its nutritional consequences with high rates of death especially in children (Olivares and Fernández, 2012).

Infections with protozoa and helminthic parasites are estimated causing illness in 450 million in the world; most of these infections are in children (Okyay *et al.*, 2004).

High rates of morbidity and mortality are caused by the intestinal parasites and these rates are related to the pathogenesis of the causative

agents, their severity, and immune status of the host (Legesse and Erk, 2004).

The occurrence of parasitic infection differ from one region to another according to many social and economical factors, such as malnutrition, personal hygiene, population crowding, drinking unsafe water, education, and poor sanitary facilities (Mohammad *et al.*, 2012).

There is a direct relationship between the prevalence of intestinal parasites and the socioeconomic status of the population (WHO, 2008). It is necessary to have epidemiological data about different parasitic infections in order to design control and prevention program in any endemic area (Asari *et al.*, 2015).

The current study was planned to provide such information on the most common intestinal parasites among population in Duhok City during the period from 2013-2017.

MATERIALS AND METHODS

The present study was a retrospective study that carried out in parasitology section - Department of laboratory – Azadi Teaching Hospital – Duhok City during the period from 2013-2017. It included analysis of the registered information of the patients referred by the physicians for stool examination. About 3,976 stool samples were examined during this period. by medical laboratory technologists for the presence of parasitic stages using direct wet mount technique.

RESULTS

A total of 3,976 stool samples were examined during the period from 2013-2017, with an annual 239 cases, out of which 1,196 (30.1%) were positive for one or more of the intestinal parasites. The recorded parasites included: trophozoites and cysts of *Entamoeba histolytica*, and *Giardia lamblia*, trophozoites of *Trichomonas hominis*, ova of *Enterobius vermicularis* and *Hymenolypis nana*.

The total rate of infection with intestinal parasites during the period of study was fluctuating as indicated in table 1. The highest infection rate was 36.7% which was reported in 2014, while the lowest was 24.3% at 2016. Regarding gender, males showed higher rates versus females (54.8 % versus 45.2%).

Table(1): The distribution of positive intestinal parasitic infection according to gender per year.

Years	Stool samples examined	Positive Stool Samples		
		Total No. and %	Males (No. and %)	Females (No. and%)
2013	839	246 (29.3)	147(59.8)	99(40.2)
2014	831	305 (36.7)	157(51.5)	148(48.5)
2015	864	269 (31.1)	143(53.2)	126(46.8)
2016	602	146 (24.3)	86(58.9)	60(41.1)
2017	840	230 (27.4)	123(53.5)	107(46.5)
Total	3976	1196 (30.1)	656(54.8)	540 (45.2)

Regarding the rate of the infection, the highest rate (28.3%) was with *E. histolytica*, other

parasites were recorded at low rates as shown in Table 2.

Table (2): -The rate of infection with the recorded parasites during the period from 2013-2017.

Parasites species	2013	2014	2015	2016	2017	Total
	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)
<i>E. histolytica</i>	232 (94.3)	287(94.1%)	251(93.3)	139 (95.2)	215 (93.5)	1124 (93.9)
<i>G. lamblia</i>	8 (3.3)	7(2.3%)	12(4.5)	6(4.1)	11 (4.8)	44 (3.7)
<i>T.hominis</i>	6 (2.4)	7(2.3%)	5(1.9)	-----	4 (1.7)	22 (1.8)
<i>E.vermicularis</i>	-----	2(0.7%)	----	-----	----	2 (0.2)
<i>H.nana</i>	-----	2(0.7%)	1(0.4)	1 (0.7)	----	4 (0.3)
Total	246	305	269	146	230	1196 (30.1)

With respect to the distribution of intestinal parasites according to gender. Males showed

higher rate of infection with *E. histolytica* during the 5 years of the study (Table 3).

Table (3): -The distribution of intestinal parasites among males and females according to species per year during the years 2013-2017.

Parasites	2013(n=246)		2014(n=305)		2015(n=269)		2016(n=146)		2017(n=230)	
	Male (%)	Female (%)	Male (%)	Female (%)	Male (%)	Female (%)	Male (%)	Female (%)	Male (%)	Female (%)
<i>E. histolytica</i>	136 (55.3)	96 (39.0)	144 (47.2)	143 (46.9)	135 (50.1)	116 (43.1)	81 (55.5)	58 (39.7)	118 (51.3)	97 (42.2)
<i>G. lamblia</i>	7 (2.8)	1 (0.4%)	4 (1.3)	3 (1%)	6 (2.2)	6 (2.2)	4 (2.7)	2 (1.4)	5 (2.2)	6 (2.6)
<i>T. hominis</i>	4 (1.6)	2 (0.8)	5 (1.6)	2 (0.7)	2 (0.7)	3 (1.1)	----	----	----	4 (1.7)
<i>E. vermicularis</i>	-----	---	2 (0.7)	----	----	-----	-----	----	----	----
<i>H. nana</i>	----	----	2 (0.7)	----	----	1 (0.4)	1 (0.7)	----	----	----

DISCUSSION

In this study 30.1% of the examined specimens were positive for intestinal parasites. Five species of intestinal parasites were recorded with the highest rate (36.7%) of *E. histolytica*, the remaining species were recorded at very low rates.

Furthermore males showed higher rates of infection than females (54.8 % versus 45.2%).

The rates of infection with intestinal parasites and the recorded species are variously reported in studies performed in Duhok province , other parts of Kurdistan and Iraq , furthermore , in most of these studies the highest rate of infection was with

E. histolytica and in general the infection was more predominant in males (Mero and Hussein, 2013, Badry *et al.*, 2014, Mero *et al.*, 2015 and Jameel *et al.*, 2017). This variation in the rate and the recorded species of parasites can be due to different factors such as, sanitary condition, economic standards, the extend of hygiene application, and type of drinking water (WHO, 1992 and Orabi, 2000).

The present study is partly in agreement with a study performed in Erbil City by Saida (2016) who recorded the same species of the parasites, but with much higher rates than the rates recorded in this study, since he reported rates of 61.24% with *E. histolytica*, followed by 26.60% with *G. lamblia*, 10% with *E. vermiculari* and 1.2% with *H. nana*

Previous studies performed in Kurdistan and other parts of Iraq, reported different rates of infection with intestinal parasites, some of them reported higher rates with protozoa, others reported higher rates with helminthes. Regarding protozoa, Faraj and Koyee (2012) in Erbil, recorded high rate of infection with protozoa, with *E. histolytica* being the highest (12.95%) followed by *G. lamblia* (8.006%) and low rates with other protozoa and helminthes. Similarly Yimaz and Abdullah (2017) in Duhok and Erbil provinces, reported the highest rate with *E. histolytica* (26.1 and 22.8%, respectively) followed by *G. lamblia* (9.5 and 5.7%, respectively). High rate of *E. histolytica* (71.8%) followed by *G. lamblia* (17.5%) with low rates of helminthes, *A. lumbricoides* 3%, *E. vermicularis* 0.4%, *H. nana* 1.2% and *S. stercoralis* 0.36% have been reported in Sharigah city of United Arab Emirates by Dash *et al.* (2010). Also in Ethiopia Chala (2013) recorded high rates with *E. histolytica* (25.4%) and *G. lamblia* (30.1%) and low rates with *E. vermicularis* (0.2%) and *H. nana* (1.36%).

On the other hand, Mero and Hussein (2013) in Duhok province, during 2008-2009 recorded high infection rate with *G. lamblia* (11.92%), followed by *E. histolytica* (10.15%), and low rates with other protozoa and helminthes. In Rmadi city, high rates of infection with *G. lamblia* (90.7%), followed by *E. histolytica* (16.0%) and low rates with helminthes, *E. vermicularis* (9.7%), *A. lumbricoides* (1.03%), *T. saginata* (0.83%) and *T. trichura* (0.32%) have been reported by

Al-Joudi and Ghazal (2005). Furthermore, in north of India, Singh *et al.* (2013) observed high infection rate with *G. lamblia* (58.5%) followed by *E. histolytica* (32%) and low rate with *A. lumbricoides* (5.8%), also in Tehran city in Iran, Asgari *et al.* (2015) examined 4,637 patients 3,450 males and 1,187 females (25.59%), and recorded high rate of *G. lamblia* (37.9%) followed by *E. coli* (26.44%), *B. hominis* (11.5%), *T. hominis* (12.53), *E. nana* (2.88%) and *E. vermicularis* (1.25%).

On the other hand, the present study disagree with studies carried out in Iraq and other countries in which higher infection rates were recorded with helminthes, such as in Nineveh province/Iraq in the years 2009-2011, high infection rates of nematodes were detected like, *T. trichura* (71.42%) during 2009, *S. stercoralis* (62.5%) in 2010 and *A. duodenale* (58.33%) in 2011 (Al-Kalak and Rahemo, 2012). In Erbil Hama and Rahemo (2014) examined 1,028 children and reported high infection rates with *E. vermicularis* 29.8% followed by *G. lamblia* 13.1% and *T. hominis* 1.7%. In Zakho City, Jameel *et al.* (2017) examined the fingernails of school children and recorded high rates of helminthes eggs, such as, *Enterobius vermicularis* (7.76%), *Hymenolepis nana* (5.82%), followed by cysts of *E. histolytica* (4.85%), egg of *Ascaris lumbricoides* (2.91%), cysts of *Giardia lamblia* (2.91%) and egg of *Trichuris trichaura* (0.97%).

In Santa -Luiza state in Brazil, Delima *et al.* (2016) during the years from 2013-2014 examined 2,021 cases and they found that *H. nana* was more frequent (33%) followed by *E. histolytica* (27%), *G. lamblia* (3%), and 1% for both *E. vermiculari*, and *A. lumbricoides*.

The variations in the prevalence rate of intestinal parasitic infections between countries and geographical areas may be due to many factors such as, socioeconomic conditions, overcrowding, hygienic and cultural habits, the ingestion of raw, unwashed vegetables and drinking of non-sterilized water especially in rural areas all these factors lead to the infection with these parasites in a given area (WHO, 1992 and Orabi, 2000). Furthermore, these parasites have simple life cycle and can be transmitted directly. The reason behind the more prevalence of infection in males than females may be due to more outdoor activities of males including

swimming in contaminated pools, eating fast food and riding restaurants with bad hygiene (Jameel *et al.*, 2017).

In conclusion, the present study indicated that the most common intestinal parasite was *E. histolytica* distributed among both genders during the studied years with more prevalence rate in males than females

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به لاقبونا مشه خوورین ریفیکا ل ده ف نه سا خین دچنه نه خووشخانا نازادی یا فیرکرنی ل باژیری دھوکئ، هه ریما کوردستان/عیراق

پوخته

بییشه کی

نه خووشیین مشه خوورین ریفیکا ئیکه ژ به لافترین نه خووشیی ل ده ف مروقی ل ناف وه لاتین پاشکه فتی. نه ف نه خووشی گه له ک هه ودان و نازارین ریفیکا په یدادکه ت و نازارین زکی، کیم بوونا خووینی نه نیمیا، دره نگ بوونا گه شی، زیده باری گه له ک هه ودانین دی وهک نازارین ریفیکا زیده.

که ره سته و ریکین فه کولینئ خاندنه کا زفرین بو پینچ سالین بووری هاته کرن ژ سال 2013-2017. پیزانین هاتته وه رگرتن ژ توومارین نه خووشا نه وین قه ستا نه خووشخانا نازادی یا فیرکرنی ل باژیری دھوکئ – هه ریما کوردستانئ دکرن. نه خووش دهاتته فریکرن ژ لایئ نووژداری بوو به شی لابوورا بوو مه ره ما پشکینا توولی. سامپلین ستوولی دهاته پشکین کرن ب ریکا ئیکسه ریما ل گه ل ئاقه کا خویی یا نورمال و ته کنیکین لوگول ایودین.

نه نجام

دقی قه کولینیدا ژ 3,976 سامپلین ستوولی، 1,196 د بوزیتیف بوون بوو ئیک یان پتر ژ مشه خوورین ریفیکا و ژ فان مشه خوورین ریفیکا

Entamoeba histolytica, Giardia lamblia, Trichomonas hominis, Enterobius vermicularis, Hymenolypis nana

و بلندترین ریژا تووشبوونئ ل ناف نیرا زیده تر بوو ژ مئ یا دا 656 (54,8%)، 540 (45,2%) ل دیف ئیک.

(1,1%)، (28,3%) *G. lamblia*، ریژا کیم، *E. histolytica* به لافترین مشه خوور

H .nana, (0,05 %) E. vermicularis

(%0,1)

ده ره نجام:

خاندنا نها دياركر به لاقبوونا مشه خوورين ريڤيكا يت نيك خانه پتر بوو ژ كر مين مشه خوور و هاته دياركرن تاريشه كا ساخله ميئ مه زنه ل ناف خه لكى دا.

انتشار الطفيليات المعوية بين المرضى المراجعين لمستشفى ازادي التعليمي في مدينة دهوك،
اقليم كوردستان / العراق

الخلاصة

الخلفية

العدوى بالطفيليات المعوية هي الأكثر انتشاراً في الإنسان في البلدان النامية ، وهذه العدوى يمكن أن تسبب اضطرابات معوية كالمغص في البطن وفقر الدم وتأخر النمو وغيرها من المضاعفات مثل التهاب الزائدة الدودية. المواد وطريقة العمل أجريت هذه الدراسة الاسترجاعية لمدة خمس سنوات من 2013 الى 2017 ، إذ تم الحصول على المعلومات من سجلات المرضى الذين راجعوا مستشفى آزادي التعليمي في مدينة دهوك ، إقليم كوردستان. وتم إرسالهم إلى قسم المختبر من قبل الأطباء لفحص البراز. فحصت عينات البراز عن طريق المسحات الرطبة المباشرة باستخدام تقنية المحلول الملحي الطبيعي و صبغة اليوداللوكولي.

النتائج

بلغ عدد العينات المصابة في هذه الدراسة من مجموع 3،976 عينة هو 196,1 من البراز لنوع واحد أو أكثر من الطفيليات المعوية الاتيه:

,Trichomonas hominsi, Giardia lamblia , Entamoeba histolytica

.Hymenolypis nana , , Enterobious vermicularis

فيما يخص الجنس وجد أعلى معدل إصابة في الذكور مقارنة بالإناث (54.8% و 45.2%) على التوالي. الطفيليات الأكثر شيوعاً كانت **E.histolytica** (28.3%) ، بينما سجلت الطفيليات الأخرى بمعدلات منخفضة وكالاتي: (**G.lambilia** 1,1%) ، **E.vermicularis** (0,05%) و **H.nana** (0,1%) .

الاستنتاج

أشارت الدراسة الحالية إلى أن انتشار طفيليات الاوالي المعوية كان أكثر من الديدان الطفيلية وتعتبر مشكلة صحية عامة مهمة بين السكان.