Distribution of intestinal parasitic infection in Erbil population

Fouad H. Kamel, Hawri Hawar Mohammed

Abstract:
A survey of prevalence of intestinal parasites among the Erbil citizen was performed during the year of 2011. The setting is a community endemic area of parasites infections without the recent previous history of antihelminthic drug distribution. Stool specimen examined for 1505 (992,65.9%) male and 513 (34.1%) female were performed for the period of 12 months (January to December) in the year 2011 in the Erbil province. A total of 1009 samples gave positive diagnoses of parasitic infection, including 494 (63.0%) males, 513 (62.2%) females patients. The common parasites found namely were *Entamoeba histolytica, Giardia lamblia, Trichomonas hominis* and *Hymenolips*. While the percentage of infection with those parasites within the positives cases were 776 (76.9%), 226 (22.4%), 6 (0.6%), 1 (0.1%) respectively during the year.

Results showed no significant differences (P. value ≥0.05) among the average parasitic infection in both sexes, while there were significant differences among months. An increase in the rates of most parasitic infection found in summer than others seasons and that explains the effect of high temperature in this season on increasing the parasitic growth. Highest degree of *Entamoeba histolytica* and *Giardia lamblia* seen in the 8th and 6th months respectively, while *Trichomonas hominis* and *Hymenolips nana* investigated in low rate during the year.

Keywords: Human parasite, Intestinal parasites, parasitic infections, Epidemiological study

Introduction:
Viruses, bacteria, parasites, or other pathogens organisms can cause infections in the stomach and small and large intestines, which often lead to gastroenteritis (1).

Intestinal parasites are one of the major health problems through their effects in causing malnutrition morbidity and incapacitation due to their activities especially in children (2). The parasitic infections were regarded 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 (3).

Intestinal parasites distributed in various ages equally in both rural and civilian environments. The number of studies deal with the prevalence of intestinal parasites in Iraq is low relatively compared with the percentages of parasite distribution (4).

In Iraq few epidemiological studies have been carried out such as those that related to control the intestinal parasites, such as those study in Nauienawa 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%) Enterobiusvermicularis, (2.95%) Ascaris lumbricoides and (0.6%) Ancylostoma duodenale in addition to presence a variation in basic blood component values in the infected and non infected individuals (5).

Al-Dulaimi (6) 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%) (7).

While another epidemiological study in Hilla City made by Al-Kubairessy (8) where investigated 4537 patients from two children hospitals in Babil, 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%), Chilomastixmesnili (0.9%), H. nana (2.2%), T. saginata (0.06%), E. vermicularis (10.4%), T. trichiura (1.6%), A. lumbricoides (0.8%) and A. duodenale (0.1%).

On this issue a study was carried out in Baghdad (Al-Jeser area), includes examination of stool specimens taken from people of different ages (1 year- to over 50 years). One hundred fifty one out of 255 persons were positive for infection with a total prevalence rate of 59.21% in the same area. They were concluded that the appearance of wastewater affects the health of the population (9).

So, the total intestinal parasites infections were recorded including Entamoeba coli, Entamoeba histolytica, Giardia lamblia, Hymenolepis nana, Enterobiusvermicularis, Ascaris lumbricoides, Ancylostoma duodenale and Trichuris trichiura. Iraq is low relatively compared with the percentages of parasite distribution (10).

The aims of this study are to obtain some information about the prevalence of gastro-intestinal parasites among Erbil governorate populations and to explore
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the various epidemiological factors that are obtained through different ways of fecal analysis

Materials and methods:
The study population comprised 1505 (992 male and 513 female) stool specimens collected from people in Erbil province in period from January 2011 till December 2011 ages among (1- over 50) years old. Stool samples were collected in sterile containers attended to the main Erbil hospitals (Nasdare Bamerny, Nawrose, Regary, Raparin, Kalk and Jamhoreya).

Examination of stool samples:
a - Examination by the naked eye:
Before microscopic examination of stool samples, the feces was examined by the naked eye for its characteristics such as its consistency, color, texture and also for the presence of larvae or adult of nematodes and/or segments of cestodes.

b - Microscopic examination:
1- Direct smear method: About 2 mg of feces were mixed with one or two drops of physiological saline (0.9 gm/dl) or Lugol’s Iodine on a slide and covered with a cover-glass and examined microscopically by 10x objective with condenser iris closed sufficiently to give good contrast and then by 40x objective to identify detected parasitic objects(11,12).

2- Concentration techniques (Sedimentation technique):
About 1 gram of feces was added to 14 ml of normal saline (0.9 gram/dl) in a conical tube and the feces was broken by glass rod and mixed with normal saline. Then the conical tube was centrifuged at 500 in a centrifuge. The supernatant was discarded (about 3 times) till it was clear. The sediment was then mixed and mounted to a slide and covered with a cover-glass and examined under microscope firstly with 10x and then with 40x(13).

3- Statistical analysis:
The statistical analyses (two-way method (ANOVA, Two-way for analysis of variance) were used for results data.

Results and discussion:
As the result of simple slide method in testing of 1505 patients stool samples were referred to major government hospitals laboratories and competence laboratories including both sex 992 (65.9%) male and 513 (34.1%) female for the period of 12 months (January to December) in the year 2011 in the Erbil province. A total of 1009 (0.07%) samples gave positive diagnoses of parasitic infection.

Table (1) showed different types of diagnosed parasites which are common among both male and female patients among Erbil citizens namely Entamoeba histolytica, Giardia lamblia, Trichomonas hominis and Hymenolepis nana. While the rate of infection of the parasites were 776 (76.9%), 226 (22.4%),

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6(0.6%) , (0.1%) respectively during the year. Which means Entamoeba histolytica infections were more distributed among Erbil individuals.

Table (1): number and percentages of diagnosed parasites among people in Erbil

<table>
<thead>
<tr>
<th>Parasites</th>
<th>Total no. of positives</th>
<th>% positive samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entamoeba histolytica</td>
<td>776</td>
<td>76.9%</td>
</tr>
<tr>
<td>Giardia lamblia</td>
<td>226</td>
<td>22.4%</td>
</tr>
<tr>
<td>Trichomonas hominis</td>
<td>6</td>
<td>0.6%</td>
</tr>
<tr>
<td>Hymenolips nana</td>
<td>1</td>
<td>0.1%</td>
</tr>
<tr>
<td>Total positive samples</td>
<td>1009</td>
<td>67.04%</td>
</tr>
</tbody>
</table>

Furthermore, in comparison to the previous study, the average of parasitic infection between male and female individuals were compared throughout the year and statistically had been analyzed depending on P-value at the level (1) as showing in table (2). It was found that there are no significant differences (P-value ≥0.05) among the average Giardia lamblia, Trichomonas hominis, and Entamoebahistolytica infection in both sexes. Low parasitic infection with Hymenolips was not accepted statistically. Also as presented in table (2) when comparing infection rates among patients over the months of the year, there were significant differences among months in infection regardless of their sex using two-way analysis method (ANOVARs, Two-way for analysis of variance).

Table (2): Infection rates over the months of the year among both sexes.

<table>
<thead>
<tr>
<th>Months</th>
<th>Giardia lamblia</th>
<th>Trichomonas hominis</th>
<th>Hymenolips nana</th>
<th>Entamoeba histolytica</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>M</td>
<td>F</td>
<td>M</td>
</tr>
<tr>
<td>1</td>
<td>2(1.6%)</td>
<td>7(6.93%)</td>
<td>0(0.0%)</td>
<td>0(0.0%)</td>
</tr>
<tr>
<td>2</td>
<td>4(3.25%)</td>
<td>5(4.95%)</td>
<td>0(0.0%)</td>
<td>0(0.0%)</td>
</tr>
<tr>
<td>3</td>
<td>5(4.1%)</td>
<td>1(0.99%)</td>
<td>0(0.0%)</td>
<td>0(0.0%)</td>
</tr>
<tr>
<td>4</td>
<td>3(2.4%)</td>
<td>3(2.97%)</td>
<td>0(0.0%)</td>
<td>0(0.0%)</td>
</tr>
<tr>
<td>5</td>
<td>7(5.69%)</td>
<td>4(3.96%)</td>
<td>0(0.0%)</td>
<td>0(0.0%)</td>
</tr>
<tr>
<td>6</td>
<td>52(42.27%)</td>
<td>37(36.63%)</td>
<td>0(0.0%)</td>
<td>0(0.0%)</td>
</tr>
<tr>
<td>7</td>
<td>11(8.92%)</td>
<td>7(6.93%)</td>
<td>0(0.0%)</td>
<td>0(0.0%)</td>
</tr>
<tr>
<td>8</td>
<td>13(10.56%)</td>
<td>11(10.89%)</td>
<td>0(0.0%)</td>
<td>0(0.0%)</td>
</tr>
<tr>
<td>9</td>
<td>5(4.1%)</td>
<td>7(6.93%)</td>
<td>1(3.33%)</td>
<td>0(0.0%)</td>
</tr>
<tr>
<td>10</td>
<td>7(5.69%)</td>
<td>6(5.94%)</td>
<td>0(0.0%)</td>
<td>0(0.0%)</td>
</tr>
<tr>
<td>11</td>
<td>7(5.69%)</td>
<td>7(6.93%)</td>
<td>0(0.0%)</td>
<td>0(0.0%)</td>
</tr>
<tr>
<td>12</td>
<td>7(5.69%)</td>
<td>8(7.92%)</td>
<td>2(66.66%)</td>
<td>0(0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>123</td>
<td>101</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

An increase in the rates of most parasitic infection found in summer than others seasons and that explains the effect of high temperature in this season on increasing the parasitic growth. Highest degree of Entamoeba histolytica and Giardia lamblia seen in the 8th and 6th months, respectively, while Trichomonas hominis and Hymenolips nana investigated in low rate during the year. Both males and females infection average with parasites were compared through the year and had analyzed statistically depending on the P-value at the level (1).
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Results showed no significant differences (P.value≥0.05) among Giardia lamblia, Trichomons homins and Entamoeba histolytica average parasitic infection in both genders, whereas 494 (63.0%) males, 513 (62.2%) females were infected. Because of low parasitic infection with Hymenolipis, it was not accepted statistically. Similar parasites were found in highest rate of infection from total number of samples in a study that was done in Sulamani, but with G. lamblia 7.96%, followed by E. histolytica 4.05%, E. vermicularis 2.25%, and both T. hominis and E. coli 0.17%(1).

References:
انتشار الإصابة بالطفيليات المعوية في محافظة أربيل

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معهد التقني الطبى في أربيل - العراق

المستخلص

أجري في هذا البحث مسح لانتشار الإصابة بالطفيليات المعوية لمواطنى محافظة أربيل خلال العام 2011. شملت عينة الدراسة شريحة من السكان دون الأخذ بنظر الاعتبار تناول الأدوية المضادة للطفيليات في المنطقة التي تعتن بهما الإصابات الطفيلية. تم إجراء الفحص المختبرى لنماذج البراز لأفراد عينة البالغ عددهم 1505 مواطن منهم 992 (65.9%) ذكور و513(34.1%) إناث ولتى (12) شهر واعتبارا من شهر كانون الثاني إلى نهاية شهر كانون الأول من العام 2011 في محافظة أربيل. بلغ عدد النماذج التي أُعطت كشفا موجبا للإصابة بالطفيليات المعوية 1009 نموذج منها 494 (63%) ذكور و513 (62.2%) إناث.

Entamoeba histolytica

تم في هذه الدراسة تشخيص الطفيليات الشائعة في محافظة أربيل للفئتين Giardia lamblia و Trichomonas hominis، حيث كانت نسبة الإصابة (Hymenolips) 776 (76.6 %)، 226 (22.4 %)، 6 (0.6%) و 1 (0.1%) على التوالي. أظهرت النتائج عدم وجود فرق معنوي (P.value ≤ 0.05) في نسبة الإصابة بالطفيليات باختلاف الجنس. بينما وجد فرق معنوي في معدل الإصابة باختلاف الأجسام وكانت أعلى نسبة للإصابة خلال فصل الصيف مما يفسر تأثير درجات الحرارة العالية في هذا الفصل على نمو وتكاثر هذه الطفيليات.

Entamoeba

كما أوضحت نتائج الدراسة وجود مستويات مرتفعة من الإصابة بكل من الطفيليات خلال شهري حزيران وأب على التوالي. غير أن نسبة الإصابة Hymenolips و Trichomonas hominis

كل من الطفيليات Giardia lamblia و Entamoeba histolytica

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