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# Assessment of the Incidence of *Entamoeba histolytica* according age and gender in Al-Muthana province

Nuha Mohammed Mousa
department of life science. Al-Muthana University / Nuhamoh@m.edu.iq

**Abstract:**

*Entamoeba histolytica*, is an intestinal protozoa parasites because a major health problem in developing countries, is the second most common cause of death due to parasitic infection. Which is usually transmitted by the ingestion of *E. histolytica* cysts through oral–fecal route so the prevalence of this parasite depends on environmental conditions and hygiene level, with increased travel and emigration to developed countries, using the available surveillance database taken from the center of Health in Al-Muthana province, from (January 2014 to December 2016), the aim of this study was determine the survey of *E. histolytica* and quantify age, gender, seasonal changes by microscopic examination. The higher rate of infection in 2015. While the highest percentage of infection in the months of (May and September). Also there was a significant difference in the percentage of infection in females higher than in males. In the age groups, the high incidence was determined in the age groups (15-44 )years.in conclusion the higher infection rates were observed in comparison with the previous studies conducted in other province, which may be as a result of the sample size, seasonal diversity and improved personal hygiene

***Key words:*** *distribution*, Amobiosis, Prevalence,

**Introduction :**

*Entamoeba histolytica* is an invasive enteric protozoan [1, 2]. Infection typically initiates with the ingestion of mature, quadri nucleated cysts found in fecally contaminated food or water. Excystation occurs in the small intestine with the release of motile trophozoites, which migrate to the large intestine. Through binary fission, trophozoites form new cysts, and both stages are shed in feces, but only cysts have the potential to transmit disease due to the protection conferred by their wall [1, 3]. Cysts can survive days to weeks in the external environment, in reverse to trophozoites which are rapidly destroyed once outside the body or by intestinal enzymes if ingested [3]. Respect to some of the parasites spread of population growth and living conditions crowded in urban environments and slums [4], and may be the countries of the Third World geographic, demographic, economic and social privacy most factors impact on the survival of parasitic diseases on the list of medical problems that have not yet been solved [5]. These homes include homes without floors supported, the defiance of health care and education environment provide a conditions contribute to some parasites to urban conditions, especially protozoa (*Cryptosporidium*, *Giardia*, *Entamoeba*) [8] in Saudi Arabia the infection rate were 5%, [9] the spread of infection depends on environmental conditions and the extent to pay attention to hygiene, as frequently in poor neighborhoods that lack health conditional [10] Disseminated, extra intestinal disease such as liver abscess, pneumonia, purulent pericarditis, and even cerebral amoebiasis has been described [1–3]. The aim of this study is to determine the prevalence of *Entamoeba histolytica* among patients in the province of Al-Muthanna.

**Materials and methods:**

Stool samples were collected during the period 2014 to the end of the 2016 from a patients who visited hospitals and health center in the province of Al-Muthana and exanimated of *Entamoeba histolytica* were confirmed by microscopic examination. Data were assessed according to the age distribution. Then analyze the percentages of the infection and carry out the probability test at P <0.05, by (SPSS, 2001).

**Results and Discussion:**

Amoebiasis is a worldwide problem; however, individuals living in developing countries are at greatest risk given poor sanitation and socioeconomic conditions. [11, 7]. Amoebic liver abscess (ALA) is ten times more common in males and commonly affects those between (18 - 50) years of age [12, 13]. The reason for this disparity is unclear [14, 15, 16].To measure the incidence of *E. histolytica* in Al-Muthana province for three years. Which conducted to identify the prevalence of *Entamoeba histolytica* among children and adults. The results have shown the rate of infection with *E. histolytica* were high as showed in table (1) % because there are many people in rural areas who suffer from parasitic infections due to poor sanitation. Parasites are also transmitted by food contaminated with feces or contaminated water. Infection characterized by diarrhea, abdominal pain and hyperhidrosis and that agree with [16] It is estimated that *Entamoeba histolytica* affects 40-50 million people and leads to approximately 100,000 deaths annually worldwide [17,18] Furthermore, incidence rates were higher in males 20 years of age or older compared to females in 2014. The peak rate occurred in males 40 to 49 years of age (14.7 per 100,000 vs. female rate of 3.3 per 100,000). [20]

As well as the proportion infection rate was 44% in two hospitals in Baghdad governorate [21] .the rate of infection was 37.8% in the city of Hila, [22] in the city of Basra, was 35.3%. (23) In Baghdad, the rate of infection Amebae 6.54% [21] this study disagree with the prevalence of G. lamblia and E. histolytica/dispa. In Najaf, Miasan, Diwaniya and Basra provinces have were 7.9%, 7%, 6.3% and 6.1%, respectively, while the lowest prevalence was in Anbar, Nineva, Erbil and Suleimaniya the rates were 0.13%, 0.4% 0.6% and 1.0%, respectively. Similar results were observed in. Najaf, Wasit, Basra, Diwaniya and Miasan provinces showed the highest rates (18.6%, 10.4%, 10.2%, 10.3% and 9.8% respectively), while the lowest rate was reported in, Diyala, Thiqar, Erbil and Nineva (0.5%, 1.9%, 1.9% 1.2% and 2.1%), respectively [24,25,26,27,28 ]

Table (1): Frequency of patients according to months and year of isolation.

| Month | Year | | |
|---|---|---|---|
| | 2014 | 2015 | 2016 |
| January | 179 (7.5) | 96 (4) | 179 (7.3) |
| February | 147 (6.1) | 131 (5.5) | 147 (6) |
| March | 190 (7.9) | 191 (8) | 190 (7.7) |
| April | 242 (10.1) | 320 (13.5) | 242 (9.9) |
| May | 249 (10.4) | 323 (13.6)a | 312 (12.7)a |
| June | 228 (9.5) | 204 (8.6) | 203 (8.3) |
| July | 117 (4.9) | 161 (6.8) | 228 (9.3) |
| August | 211 (8.8) | 207 (8.7) | 207 (8.4) |
| September | 267 (11.1)b | 241 (10.1) | 241 (9.8) |
| October | 158 (6.6) | 147 (6.2) | 147 (6) |
| November | 252 (10.5) | 215 (9) | 215 (8.8) |
| December | 155 (6.5) | 142 (6) | 142 (5.8) |
| P valuea | <0.00001* | <0.00001* | <0.00001* |
| P valueb | | <0.00001* | |
| P valuec | | 0.526 | |

* represents a significant difference at p<0.05.

There is a significant difference among months of each year and there is association analysis in infection frequency between the year and months distribution among the total numbers of years of infections (2014, 2015, and 2016).

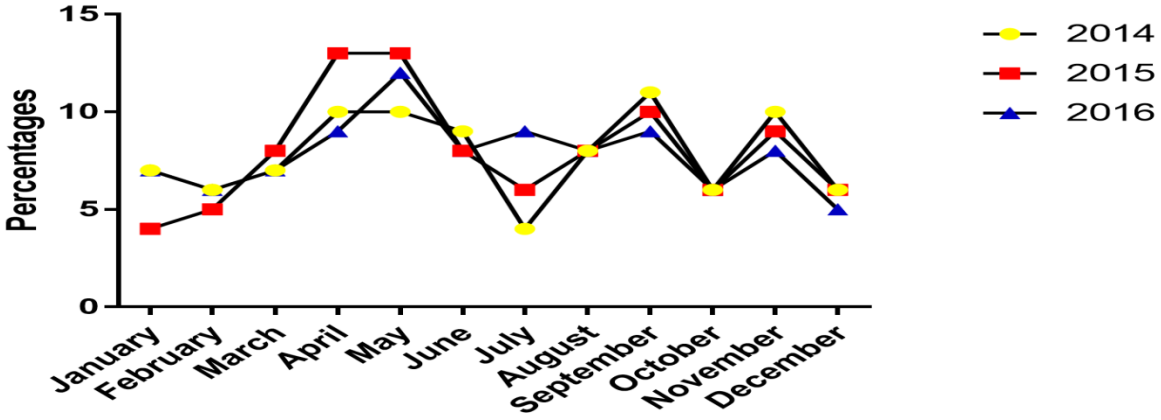


Fig. (1): Frequency of patients according to months and year of isolation.

At the same time, infection rates were increased in compare of that in many researchers, We showed in table 1 that the infection rate was higher in the months of April and May and this is identical to many studies that refer to the effect of high temperature in the spread of infection and increase consumption of water and vegetables for example In Baghdad the lowest infection rate was in ((January (11.50%) in 2002 and in May (5.80%) in 2003. Subsequently, (46.2%) in 2002, and in April (62.6%) in 2003)). [29] Seasonality was shown to play a significant role in the

occurrence of *E. histolytica*. The highest incidence rates were seen in end of winter and spring. This result agreed with other studies, which showed that a high incidence of these parasites occurred in the rainy seasons [30], as well as reports that indicate that during cold seasons, *E histolytica* cysts are infective for a longer period than during dry seasons [31, 32].The results of this study show a significant of the highest percentage of infection is (32%, in 15-44 age group in 2015) this result agree with [32]. The majority *E. histolytica* positive samples came from the (15-44) year age group, which may be due to the reality that this age group is more likely to be engaged numerous job activities that could expose people to contaminated land [31]. This result is in agreement with other reports which showed more cases in (15-44) year's old individuals for some gastrointestinal parasitic infections compared to other age groups [32].

The results of the current study showed that the percentage of total parasitic infection among children who visited the hospital in Al- Muthana and referred to the laboratory was 18%, disagree to with the study in Baghdad the infection rate were 61.5% in children [21], while disagree with the rate among primary school students in Erbil [39] and the other study (61.6%) in children under one year of age in Basra [36]. This may be due to the similarity of Iraq's conditions in general, which is high compared with those found among Turkish children (22.5%) [37]Current rates are higher than those recorded by 29 children in Diyala governorate who received a total infection rate of 41.5% [38, 39] in Baghdad 34.2%, and the current rate is much higher than that recorded by [44] in children in Baghdad, the percentage was very low 20.3% compared to above and may be due to the sites and the season that completed the study. [30]. around the differences between Al-Muthana province and Baghdad in disability level and also changes in environmental condition like (rain fall, humidity, temperature).

Table (2): Frequency of patients according to age and year.

| Age groups | Year | | | P value |
|---|---|---|---|---|
| | 2014 | 2015 | 2016 | |
| 0-1 year | 139 (5.8) | 116 (4.9) | 139 (5.7) | 0.261c |
| 1-4 years | 427 (17.8) | 402 (16.9) | 432 (17.6) | 0.541c |
| 5-14 years | 657 (27.4) | 652 (27.4) | 670 (27.3) | 0.877c |
| 15-44 years | 723 (30.2) | 749 (31.5) | 757 (30.9) | 0.654c |
| 45-60 years | 449 (18.7) | 459 (19.3) | 455 (18.5) | 0.946c |
| P value | <0.00001*a | <0.00001*a | <0.00001*a | |

* represents a significant difference at p<0.05.

Table (3): Frequency of patients according to Age and gender

| Age groups | Gender | | P value |
|---|---|---|---|
| | Male | Female | |
| 0-1 year | 176 (4.9) | 218 (6) | 0.034*c |
| 1-4 years | 579 (16.2) | 682 (18.7) | 0.004*c |
| 5-14 years | 1035 (28.9) | 944 (25.9) | 0.041*c |
| 15-44 years | 1127 (31.5) | 1102 (30.2) | 0.596c |
| 45-60 years | 660 (18.5) | 703 (19.3) | 0.244c |
| P value | <0.00001*a | <0.00001*a | |

* represents a significant difference at p<0.05

Table (4): Frequency of patients according to gender and year of isolation.

| Gender | Year | | | P value |
|---|---|---|---|---|
| | 2014 | 2015 | 2016 | |
| Female | 1180 (49.3)% | 1212 (51)% | 1257 (51.2)% | 0.292c |
| Male | 1215 (50.7)% | 1166 (49)% | 1196 (48.8)%s | 0.599c |
| P value | 0.474a | 0.346a | 0.218a | |

* represents a significant difference at p<0.05.

Gender is the other factor which influenced significantly the prevalence of these protozoan parasites in this survey. The majority of positive cases were reported in males. This is probably According to the results of this study, there were no significant differences (p> 0.05) in the spread of *E histolytica* according to gender. The percentage of parasitism in females was 49.3, 49.9 and 47.6%, while the percentage of males was 53.4, 51.0 and 51.7. the results of the study were consistent with the studies carried out by in the city of Babylon (35), and in the city of Duhok (36)

In a study in the city of Basra, they found higher rates of infection in males. Of the reasons for the absence of differences of statistical significance due to the convergence of habits leading to the spread of parasites between the gender (36, 40, and 41) this is due to the activity of males in playing outside the home. As for the percentage of injury according to the years, the rate of injury in 2014 was 2016 and

2016 respectively. We believed that the environmental factors change from low and high temperature and increase the health awareness and the amount of rain all these factors affect the spread of parasite (42)

In conclusion, our findings from this report show a greater incidence of *E. histolytic* in the population being surveyed. These results show the need for long term control measures to enhance health and living circumstance especially in areas with high prevalence. The impact of these strategies would be improved through an organized health and education programs that can promote and enhance.

**Ethical issue**

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