Infection with Entamoeba histolytica and its effect on some blood parameters in Najaf City

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Abstract. The study was done in Al-Najaf Health Department \ Alforat Al-Awsat Hospital. The total number of examined patients were (80) for both sexes (males and females) in different ages (children's and adults). The chosen patients had single infection with Entamoeba histolytica was diagnosed in 32(40%) stool samples from the total number examined. The results showed no significant differences between males (40%) and females (40%) in tested with parasites. The samples were recorded the average percentage in the cyst stages of E. histolytica at a higher rate, where it reached (87.5%) than the trophozoite stage of E. histolytica, where it reached (12.5%). There were significant differences at the level of p <0.05 when studying the effect of E. histolytica parasite in both stages (cyst and trophozoite) in some blood parameters (PCV, Lymphocyte, Granulocyte and Platelets count). Also, results showed a significant differences only in the cyst stage in (MCV, MCH and Monocyte) and there were no significant differences in the other blood parameters (Hb, WBC, RBCand MCHC) among the infected and non-infected person with E.histolytica parasite.

Kew words. E. histolytica, Blood parameters, Cyst, Trophozoite, parasite.

1. Introduction
The discovery of the parasitic protozoa at the end of the seventeenth century AD, after the discovery of magnifying glasses by Antonie van Leeuwenhoek in 1681, where this researcher has known many parasitic protozoa after examining the samples of water, human stool and some animals and known as the amoebic dysentery, he was reported that the disease bloody dysentery is caused by this parasite named (E.histolytica). Intestinal parasites are one of the most common human infections since they are spread all over the world, particularly in developing countries [1]. They cause many diseases to humans and animals, some cause diarrhea, which may be bloody, such as E.histolytica parasites that called amoebic dysentery [2].

Intestinal parasites are transmitted in several ways depending on the type of parasite. Some of them are transmitted through the mouth after eating contaminated food or drink, also contamination of hand with ova, cyst or larval stages, which represent the infective stages of these parasites in the mouth. Infection can be transmitted among family members from infected children in the same of the family [3]. Traffickers are also the source of transmission when they are infected with parasite [4].

[5] conducted that in Khurasan province of Iran on children, with infection of intestinal parasites have about of (47.7%). In Iraq, a number of studies were conducted [6] in Diwaniya province, the studies
showed that the number of children infected with intestinal parasites have about of (21.1%) and the E.histolytica was recorded highest rate of infection, which is about (66.8%). Also [7] in his study in the province of Babylon, recorded the highest rate of infection with E.histolytica cases in September, which is about of (41. 93%).

Social and economic conditions have a clear impact on the spread of intestinal parasites. It has been observed that people in crowded places with an inadequate health and environmental system are more probable to be infected than others. The intestinal parasitic infections cause many health problems such as anemia, which means a high percentage of people around the world [8]. Diarrhea is one of the causes of diarrheal cases of amebiasis, an endemic disease in developing countries and due to the spread of intestinal parasites in Iraq in general and in the province of Najaf in particular, the idea of the study was aimed at studying blood parameters.

2. Materials and Methods

2.1. Collection of samples

2.1.1. Collection of Stool Samples
Eighty (80) stool samples were collected by using clean plastic containers with a cover from people with diarrhea and some other intestinal disorders coming to Alforat Al-Awsat Hospital in different ages (children's and adults) for a period of three months and information's have been recorded according to a special form prepared for this purpose.

2.1.2. Blood Collection
Eighty (80) blood samples were collected for people with E.histolytica and the reality of (1) ml of each person was placed in EDTA tubes in order to conduct blood tests.

2.2. Determination of Blood Parameters
Estimation was done to the blood parameters which include (Hemoglobin levels Hb, Packed Cell Volume PCV, Total Leukocyte counts WBCs, Differential Leukocyte Counts DLCs, Platelets Counts and other indicators such as Mean Corpuscular Volume MCV, Mean Corpuscular Hemoglobin MCH, and Mean Corpuscular Hemoglobin Concentration MCHC), which estimated by hematology analyzer (Spinreact, Spincell 3).

3. Results
Table 1 shows that there were no significant differences in the patients with E.histolytica parasites concerning gender distribution for both males and females.

Table 1. Distribution of E.histolytica to sex.

|       | Sex    | Male | Female | Total |
|-------|--------|------|--------|-------|
| Examined | 35     | 45   | 80     |
| + ve No. | 14     | 18   | 32     |
| %      | 40%    | 49%  | 40%    |

Table 2 shows that there were significant differences between the cyst and trophozoite stages, the highest percentage was recorded in the cyst stage, it was reached about (87.5%) while in the trophozoite stage, it was reached about (12.5%).

Table 2. Distribution of E.histolytica stages.

|       | Stages | Trophozoite | Cyst | Total |
|-------|--------|-------------|------|-------|
| + ve No. | 4      | 28          | 32   |
| %      | 12.5   | 87.5        | 100  |
As for table 3, the results have shown no significant differences in the value of (hemoglobin levels, the count of white blood cells, the count of red blood cells and in the value of MCHC). As well as, it was observed that there were significant differences in the case of parasite E. histolytica with (the cyst and the trophozoite stage) for values of PCV, were have about of (38.16 ± 9.91 and 39.00 ± 1.00) respectively compared with control groups (non-infected persons), were have about of (34.00 ± 2.56 and 23.33 ± 3.36) respectively compared with control groups, were have about of (207.33 ± 9.91 and 26.90) respectively compared with control groups, were have about of (212.33 ± 106.00). There were significant differences in both MCV and MCH with the cyst stage only of the parasite E. histolytica, they were have about (71.26 ± 7.64 and 85.66 ± 4.98) respectively compared with control groups, they were have about (86.03 ± 3.71 and 29.16 ± 1.18) respectively, while no significant differences were observed in the trophozoite stage of the parasite as compared with the control group.

Table 3. Blood Parameters in relation to E.histolytica infection.

| Parasite   | HB (M±S.D) | PVC (M±S.D) | WBC (M±S.D) | RBC (M±S.D) | MCV (M±S.D) | MCH (M±S.D) | MCHC (M±S.D) | Platelets (M±S.D) |
|------------|------------|-------------|-------------|-------------|-------------|-------------|--------------|------------------|
| Control    | 11.66 ± 0.76 | 34.00 ± 2.56 | 9.36 ± 4.42 | 4.02 ± 0.44 | 85.66 ± 4.98 | 29.16 ± 1.18 | 34.13 ± 1.29 | 212.33 ± 106.00 |
| E.histolytica (Cyst) | 12.7 ± 3.73 | 38.16 ± 9.91 | 8.06 ± 5.30 | 39.00 ± 1.00 | 86.03 ± 3.71 | 23.33 ± 3.36 | 32.66 ± 3.36 | 207.33 ± 24.60 |
| E.histolytica (Troph.) | 13.0 ± 0.22 | 39.00 ± 1.29 | 8.43 ± 4.29 | 30.5 ± 1.13 | 35.6 ± 3.36 | 154.66 ± 29.10 |

Table 4 shows significant differences in both lymphocytes and granulocytes concerning both stages (cyst and trophozoite) of the parasite E. histolytica, they were (21.23 ± 16.70), (67.76 ± 24.60) respectively in the cyst stage, and (14.23 ± 2.62 and 54.46 ± 32.90) respectively in the trophozoite stage compared to their control groups (17.5 ± 5.33 and 76.03 ± 6.71) respectively. While there were a significant difference in monocytes for the cyst stage only (11.00 ± 7.93) when compared to its control group (6.46 ± 1.38), regarding the trophozoite stage of E. histolytica parasite, there were no significant differences when compared with its control group.

Table 4. Differential white blood cell counts in relation to E.histolytica infection

| WBC types | Lymphocyte (M±S.D) | Monocyte (M±S.D) | Granulocyte (M±S.D) |
|-----------|-------------------|-----------------|--------------------|
| Control   | 17.5 ± 5.33       | 6.46 ± 1.38     | 76.03 ± 6.71       |
| E.histolytica (Cyst) | 21.23 ± 16.70   | 11.00 ± 7.93    | 67.76 ± 24.60      |
| E.histolytica (Troph.) | 14.23 ± 2.62    | 7.86 ± 1.16     | 54.46 ± 32.90      |

4. Discussion
The study showed that parasitic infection of the cyst stage was the most present of the trophozoite stage of E. histolytica parasite. This may be due to the motility of the parasite in which amoeba is immotile in case of cyst stage but capable of tolerating the harsh living conditions surrounding it such as acidity of the stomach. For example, the amoeba can live outside the body and can transmitted infection from person to another. The cause of the high infection may be due to the use of river water or liquefied water,
which may not be properly sterilized or due to chlorine supplementation results similar to several studies [9; 10; 11].

Changes in the value of PCV, MCV, MCH indicated anemia due to iron deficiency, as well as, the parasite causes diarrhea so this symptom, in turn, cause dehydration and affect the value of PCV and this corresponds to several studies [12, 13, 14].

Also the changes in the white blood cells may be due to the presence of the parasite, where the white blood cells, especially lymphocytes and granule cells were by the presence of parasite as an immune response to the body against the parasite this results were recorded by [12,15] in their studies.

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