Abstract
The current study aimed to reveal the evaluation of the level of liver function in infected with the parasite Entamoeba histolytica, Blood samples were collected during the period from the beginning of August 2021 until the month of April 2022. The separated sera were kept at -20 degrees until use. Enzyme-linked immunosorbent adsorption (ELISA) technique was used to detect dysentery amoeba infection. ALP, ALT, AST concentrations were measured using Spectophotometric method. In the current study, 250 samples were taken, and the number of samples infected with the dysentery amoeba parasite was 120 samples with a percentage of 48%, and the infection rate for sex was 85 samples infected with males by 59%, and about 35 samples were infected with 33% of females. The results of the current study showed a significant P≤0.05 increase in the levels of (GPT 4.464±54.214), , ALP 0.5542±6.7440 when compared with control group (7.14±39.340 ) and 0.5699±5.8061). There was an increase in the levels of (ALT 4.409±46.35), AST 7.19±62.44, ALP 0.42386±6.4563) when compared with control group (7.14±39.340, 9.75±54.16, 0.5699±5.8061 respectively.

Keywords: liver functions, E.histolytica, Samarra city.

1-Introduction
During life, a person is exposed to many infections caused by parasites and these parasites are: E.histolytica is a primary human intestinal parasite. There are several species of the genus Entamoeba parasite in humans. These include: Entamoeba histolytica, Entamoeba dispar, Entamoeba coli, Entamoeba hartmani, Entamoeba polecki, Entamoeba gingivalis. (Ash and orihel, 1980)

Only E. histolytica is a pathogen and causes amoebiasis or is called amoebiasis or dysentery (Sateriale et al., 2011). It is an intestinal parasite that colonizes the lumen of the human intestine and has the ability to invade the epithelium. Amoebic dysentery occurs when it invades the walls of the intestine and multiplies in the mucosal layer causing ulcers and the epithelial layer of the intestine. The most common infections caused by the parasite E.histolytica are dysentery, colitis, flatulence, weight loss, fatigue and pain in the stomach. abdomen.

A common consequence of amoeba invasion of tissues is liver abscesses that can be fatal and secrete the pathogen histolysin (1988, Luaces), which causes problems to the intestines of the affected individual hence the Latin name histo (tissue) Lytica (destroy) (Stanely, 2003) causing food intake Polluted or water containing pouches can cause them to grow in the intestines. Each cyst produces eight numbers of active phase Trophozoite which colonize the host colon. In cases where the infection is not limited, amoebic dysentery and the formation of liver abscesses can occur. Ninety percent of infections are asymptomatic and self-healing. The scientist Sateriale and his group (2011) showed that there are about 50 million infections annually that affect the liver E. histolytica parasite. Amoebic liver abscesses
occur by eating food or water contaminated with human feces. Among the symptomatic infections, though, amoebic dysentery is the most common presentation. In rare cases, it can cause extraintestinal disease, when trophozoites invade the intestinal mucosa and spread the blood. Liver abscesses are the most common symptom outside the intestine. The trophozoites reach the liver via the portal venous circulation, causing significant damage (Salit et al., 2009).

2-Sample collection:
This study was conducted in Samarra city, the samples were collected from both sexes for the period from (12/8/2021) to (2/4/2022). 250 samples were collected to detect the presence of the parasite *E. histolytica*. Samples of the parasite *E. histolytica* were obtained from patients and patients in Samarra General Hospital who suffer from moderate to severe diarrhea and in most cases suffer from bloody diarrhea.

The samples were placed in sterile containers with a wide opening with a stopper Airtight to maintain sample moisture and prevent dryness. Samples were examined within half an hour of their arrival in the laboratory, with care taken when examining blood or mucus-containing areas, as their presence often indicates an infection by the tissue-lytic amoeba parasite (Clark & Diamond, 2002).

3-Study design:
The study groups were divided into three groups:
1- the group with diarrhea
2- the group infected with the parasite amoeba dysentery
3- (control groups) Where the liver enzymes were measured, namely: 1- Alkaline phosphatase (ALP) activity 2- Calculating GPT enzyme activity 3- Aspartate aminotransferase activity

4-Statistical analysis:
The results obtained from the current study were analyzed using the statistical program SPSS and Duncan's polynomial test was used to compare between four groups at the level of significance P≤0.05 to identify the degree of significant differences between the groups' averages (Al-Rawi, 1989).

5-Results and discussion:
Samples were collected from patients coming to external laboratories, private clinics, and Samarra Hospital. Table (4_1). Epidemiological studies on the prevalence of parasitic intestinal infections in different regions usually aim to identify communities at risk and diseases that pose risks to human populations, making it necessary to conduct further studies on infections that threaten human health worldwide (Saida et al., 2016). Many environmental, biological, behavioral, social, economic and health factors influence parasitic infection directly or indirectly. The quality of city or village infrastructure, income, occupation, and level of education are also important aspects that affect the spread of infection, transmission of disease and mortality (Coulibaly et al., 2012). The total positive samples that were represented by individuals carrying E. Histolytica parasite 120 (48%) were the same It is illustrated in Figure (4-1), while the rest of the samples were considered negative for the disease. This result is consistent with that reported by (2016) Al-Daerchi & El-Ebrihami and Hamza and his group (2021).

In Iraq, witnessed the lowest infection rate during the study period, which may have been due to the Corona Virus 2019 (COVID-) epidemic 19) in Iraq, which led people to fear hospitals and health centers.

Table (1) shows the percentage of samples examined for *E. histolytica*

<table>
<thead>
<tr>
<th>Total number of samples</th>
<th>The number of infected samples</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>120</td>
<td>%48</td>
</tr>
</tbody>
</table>
Distribution of infection with *E. histolytica* parasite according to the ages of the study groups

In the current study, infection rates varied according to age, and the highest incidence was in the age group (1-10 years) 46% and from (10-20) 53% respectively of the total infected samples in the study population, Table (4-3).

The results are agreed with several studies, the Saida studies (Saida *et al.*, 2016); and (Al-Taei, 2019) in Iraq; and (Nath *et al.*, 2015) in India, (Al-Dalabeeh *et al.*, 2020) in Jordan, and Al-Harazi (2016) and (Qasem *et al.*, 2020). Variation in intestinal parasitic infections is expected according to age, as daily activities and behavioral habits play an important role in determining the time and type of exposure to the infective stage of the parasite (Ahmed *et al.*, 2020).

Research indicates that children who do not wash their hands after defecation are more susceptible to infection with *E. histolytica*. It has also been reported that in developing countries, contaminated hands play an important role in faecal-oral transmission and hand washing before eating or after evacuation have been considered a secondary barrier (Anuar *et al.*, 2012).

The research also showed that children with lower immunity are more prone to infection in young participants and lower infection rates in adults due to the developed immunity against parasitic diseases (Yadav & Prakash, 2017).

Table (2) It shows the percentage of samples infected with *E. histolytica* according to age groups

<table>
<thead>
<tr>
<th>Age categories</th>
<th>The number of samples examined</th>
<th>The number of infected samples</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1-10) years</td>
<td>75</td>
<td>35</td>
<td>46.6%</td>
</tr>
<tr>
<td>(10-20) years</td>
<td>60</td>
<td>32</td>
<td>53.3%</td>
</tr>
<tr>
<td>(20-30) years</td>
<td>40</td>
<td>15</td>
<td>37.5%</td>
</tr>
<tr>
<td>(30-40) years</td>
<td>35</td>
<td>20</td>
<td>57%</td>
</tr>
<tr>
<td>(40-50) years</td>
<td>25</td>
<td>10</td>
<td>40%</td>
</tr>
<tr>
<td>(50-60) years</td>
<td>15</td>
<td>8</td>
<td>53%</td>
</tr>
<tr>
<td>the total</td>
<td>250</td>
<td>120</td>
<td>48%</td>
</tr>
</tbody>
</table>

6-Conclusion:
A high significance levels of enzyme liver in patients with *E.histolytica* than healthy people which is that mean there is a relationship between infection and liver function and the infection has direct effect on liver.

Effect of the parasite *E. histolytica* on liver function:

In Table (4-2), the levels of liver enzymes increased significantly of the patients when compared with control group. If they are as follows (a 54.241 ± 4.464), (b 46.356 ± 4.409) and c) 39.340 ± 7.14) for (alanine aminotransferase) respectively. and b) 52.36 ± 4.584), (a 62.44 ± 7.19) and (b 54.16 ± 9.75) for Aspartate aminotransferase, respectively. and b) 52.36±4.584), (a62.44±7.19) and (b54.16±9.75) for Alkaline Phosphatase, respectively. This is consistent with what was found by Al-Kubaisi (2002) to note the high level of ALP enzyme concentration reached 90% of cases with a high level of AST, ALT enzyme in the serum of patients with diarrhea. This result agreed with the results of (Pluta & Pluta, 2008) as very high levels of ALP.
Liver enzymes in the serum of patients infected with the parasite, as well as Al-Ghanmi (2013) showed to increase the levels of liver enzymes in mice infected with the parasite Giardia, but this is not consistent with what was recorded that liver function tests in patients with dysentery level were normal, except for the enzyme ALP for high note level. (Fernandes et al., 2009) This could be because of these enzymes are mostly excreted and remain in the liver. But when the liver is injured for any reason, these enzymes are poured into the bloodstream. These enzymes are usually present mostly within liver cells and to a lesser extent in muscle cells. If the liver is injured or damaged, liver cells spill these enzymes into the blood, raising blood levels of aspartate aminotransferase (AST) and alanine aminotransferase (ALT) and indicate liver disease, while alkaline phosphate (ALP) it is a substance found in the bile ducts of the liver, intestines, and bones. Damage or blockage of the bile ducts may cause ALP levels to rise. These tests can provide a range of information about a range of disease processes (Dufour, 2001). Elevation in AST, ALT, and ALP is the result of extensive degradation of liver tissue leading to liver necrosis that occurs during migration of trophozoites (Kolodziejczyk et al., 2015). Elevated levels of AST, ALT, and ALP have been reported in patients with liver abscess. Systemic complications associated with liver dysfunction found an increase in all liver enzymes. A study in laboratory mice showed that there was an increase in levels of AST, ALT, when liver cells were invaded by trophozoites. Injury to liver cells causes these enzymes to spill into the bloodstream, thereby increasing the serum enzyme level. Similarly, an elevated level of ALP has been reported due to obstruction or damage to the bile duct in the liver (Dufour, 2001). The present results are in agreement with the results of elevated levels of liver enzymes in the serum of patients with amebiasis (Pluta & Pluta, 2008).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Control Mean ±S.D</th>
<th>Diarrhea Mean ±S.D</th>
<th>Patient Mean ±S.D</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alanine aminotransferase</td>
<td>39.34±7.14</td>
<td>46.35±4.409</td>
<td>54.24±4.464</td>
<td>0.0009</td>
</tr>
<tr>
<td>Aspartate aminotransferase</td>
<td>54.16±9.75</td>
<td>62.44±7.19</td>
<td>52.36±4.58</td>
<td>0.001</td>
</tr>
<tr>
<td>Alkaline Phosphatase</td>
<td>92.52±12.96</td>
<td>104.52±20.28</td>
<td>116.47±13.59</td>
<td>0.0008</td>
</tr>
</tbody>
</table>

*Similar English letters indicate that there are no significant differences at a significant level (P<0.05 .)

References: