

Coinfection between Amoebic Liver Abscess Caused by *Entamoeba histolytica* and Hepatitis A in AL-Najaf Governorate

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ABSTRACT

Background: It was the goal of the current research study to determine the link between hepatitis a virus infection and amoebic liver abscess, as well as to determine the effects of hepatitis a viruses and amoebic liver abscess on the serum levels of biochemical markers such as IL-2, IL-8, and IL-10 (ALP, ALT, AST and TSB) From February 2021 to January 2022, the current study was conducted. Patients from Al Furat General Hospital in AL-Najaf Province, Al Sader General Hospital, AL-Zahra maternity and pediatrics, and AL-Hakeem Hospital have been referred to this laboratory for testing. Hepatitis A infection and amoebic liver abscess coinfection were both more common in men than in women, according to the findings of the current study. Hepatitis A was found to be most prevalent in males between the ages of 8 and 17 and females between the ages of 18 and 27 in the current investigation. Results from the current study show that interleukin 2 concentrations rose in coinfections between amoebic liver abscess and Hepatitis A at a rate of (13.572-8341.2) compared to Hepatitis A (11.113-873.4) and Amoebic liver abscess (8.789-473.2). However, interleukin 8 concentrations rose to the highest level in Amoebic liver abscess (12.32-555.43) compared to Hepatitis A (5.765-64.5). (35-322.8), Coinfection between amoebic liver abscess and Hepatitis A was shown to have the highest level of ALT (9.19-812.2) compared to Hepatitis A (23.8-102.6) and Amoebic liver abscess (32.12-50.1) ,(0.12-3.32).

Keyword: Amoebic Liver Abscess, Hepatitis A, Hematological Parameters, Entamoebae Histolytica, IL-2,8,10.

Article Information

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INTRODUCTION

The protozoan *Entamoeba histolytica* causes amebiasis, which is spread by the fecal-oral route. Symptoms might range from an asymptomatic state to several consequences linked with liver abscesses, depending on the severity of the infection. More than half of amebic liver abscesses are caused by amebic infection. Between the ages of 18 and 50, males are the most likely to have the condition. India, Africa, Mexico, and Central and South America, all have significant incidences of amebic infection. Patients with this condition are likely to experience fever, right upper quadrant abdominal pain, and gastrointestinal symptoms within the first two to four weeks of their illness. On

the basis of clinical symptoms, relevant epidemiology, radiographic examinations, and serologic tests the correct diagnosis can be made. ^(1,2).

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The phrase "viral hepatitis" refers to any illness of the liver caused by viruses that are able to multiply in the body ⁽¹⁾. Hepatitis is an inflammation of the liver. Viral, toxic, metabolic, pharmacological, or immune-mediated liver attack are only a few of the causes of liver inflammation. Jaundice is a common symptom of hepatitis induced by other factors, such as alcohol or drug addiction or metabolic abnormalities ⁽³⁾. Global public health is concerned about viral hepatitis, which is a major cause of both illness and mortality in many countries around the world ⁽⁴⁾. Hepatitis A, B, C, D, E, F, and G are all caused by different viruses. When it comes to liver infections, Hepatitis B and C share many of the same characteristics as their more well-known cousins ⁽⁵⁾. Inflammatory hepatitis is an acute hepatitis episode that lasts just a short time. As the disease progresses, symptoms range from moderate to severe, including jaundice, nausea and malaise, to liver failure or even death, during this period of up to six months ⁽⁶⁾. As with acute hepatitis, chronic hepatitis has the

same range of clinical outcomes as acute hepatitis ⁽⁷⁾. In general, HAV infection is self-limiting and can have effects ranging from a lack of symptoms to death from fulminant hepatitis. HAV-associated illness is more likely to become manifest in older people. In children over the age of six, 70% of infections are asymptomatic. ⁽⁸⁾. As for disease, anicteric is the most common type. There is often a clinical illness in the elderly, children, and adults, with jaundice occurring in about 70% of cases ⁽⁹⁾. There is a very rare but serious consequence of the Hepatitis A virus known as Fulminant Hepatitis (FH). Acute liver failure can strike anybody, but it is most common in young children and the elderly who have underlying chronic liver disease) ^(10,11).

MATERIALS AND METHODS

Population Study.

Patients: From February of 2021 through January of 2022, researchers worked on this project. There was a total of 79 patients referred to the Al Furat General Hospital, Al Sader General Hospital, Al-Zahra maternity, and pediatrics, and Al-Zahra maternity and pediatrics laboratories. from February, 2021 to January, 2022, at the Al-Hakeem hospital. At least 79 people have visited the Al Furat General Hospital in AL-Najaf province, Al Sader General Hospital, AL-Zahra maternity and pediatrics, as well as AL-Hakeem Hospital in AL-Najaf province for laboratory testing.

Method: Each participant in this trial gave a blood sample of 5 ml using a 5 ml syringe and a vein incision. Two tubes of blood were used, one of which contained the anticoagulant EDTA. It took 15 minutes to centrifuge the second sample, which was 3 milliliters in volume. After 30 minutes of thickening at 37 degrees Celsius in a plane tube, the plasma from the main tube was collected using a programmed micropipette and transferred to

Eppendorf tubes, where it was stored at - 20 degrees Celsius. The sera from the second tube were also collected and stored in Eppendorf tubes at - 20 degrees Celsius.

Laboratory tests

Wet mount Examination

Microscopically, fresh voided stool specimens were analyzed for intestinal parasites using an X40 objective lens as described by ^(12,13). Ten X40 objective fields of the stool smears were inspected before a slide was pronounced negative.

Immunological test

An analysis of human IL-2. (Campus, Vienna Biocenter 2 | 1030 Vienna, Austria; IL-10 and IL-8 detection (Biolegend Inc., San Diego, USA) (Life,Span BioSciences,,Inc.spain)

Biochemical tests. MyBioSource, San Diego, USA, Alanine, Aminotransferase (ALT/GPT), Aspartate, Aminotransferase (AST/GOT), (Randox Lab. UK), Alkaline Phosphatase (ALP). Cell Biolabs' Bilirubin Assay Kit analyzes total and direct bilirubin in blood, plasma and urine as well as in cell lysates and

tissues, and is available from MyBioSource in San Diego, California, the United States ^(14,15).

Hematological Tests

Hb, PCV, WBCs, and PLT. The following is the underlying principle: COUNT THE BLOOD (CBC) Analyzers from Sysmex are used to determine 23 whole blood diagnostic parameters (WBC; RBC; MCV; MCH; MCHC; PLT; RDW-SD; RDW-CV; MPV; NEUT# and LYMPH# and MONO# and EO# and BASO# and IG#; NEUT percent and percentage of LYMPH percent; MONO percent and percentage of BASO percent; IG ^(16,17).

RESULTS D

Gender

The results of the current study showed a higher incidence of male infection than females in each of the Hepatitis A and coinfection between amoebic liver abscess and Hepatitis A

Table (1) Distribution of patients with hepatitis a, Amoebic liver abscess and coinfection between amoebic liver abscess and Hepatitis A infection according gender

Gender	Hepatitis A	Amoebic liver abscess	coinfection between amoebic liver abscess and Hepatitis A
Male	20	12	10
Female	16	15	6
Total	36	27	16

Age group

The results of the current study showed that the age group most affected by hepatitis A (8-17) in male and (18-27) in female

Table (2) Distribution of patients with hepatitis a infection according age group

Age Groups (year)	Male	Female
8-17	9	5
18-27	7	8
28-37	5	3
Total	20	16

Age groups and gender

The results of the current study showed that the age group most affected by Amoebic liver abscess (28-37) in male and (8-17) in female

Table (3) Distribution of patient's Amoebic liver abscess infection according age groups and gender

Age Groups (year)	Male	Female
8-17	3	9
18-27	4	4
28-37	5	2
Total	12	15

Age groups and gender

The results of the current study showed that the age group most affected by Amoebic liver abscess and hepatitis A (8-17) in male and (18-27) in female

Table (4) Distribution of patients with Amoebic liver abscess and hepatitis a infection according age groups and gender

Age Groups (year)	Male	Female
8-17	6	1
18-27	3	5
28-37	1	-
Total	10	6

Interleukin –2-8-10 (IL – 2, IL-8-IL-10)

Interleukin 2 concentrations in coinfections of amoebic liver abscess and Hepatitis A were shown to rise at a rate of (13.572-8341.2) compared to Hepatitis A (11.113-873.4) and Amoebic liver abscess (8.789-473.2).

Table (5): Evaluation serum level of IL-2, IL-8 and IL-10 in HAV, Amoebic liver abscess and coinfection between amoebic liver abscess and Hepatitis A infection

level of Interlukin	Hepatitis A	Amoebic liver abscess	coinfection between amoebic liver abscess and Hepatitis A
IL-2	11.113-873.4	8.789-473.2	13.572-8341.2
IL-8	5.765-64.5	12.32-555.43	32.43-222.21
IL-10	5.45-58.39	13.34-187	11.03-367.7

Liver function test

There was a higher concentration of ALT in coinfection between amoebic liver abscess and Hepatitis A (9.19-812.2) compared to Hepatitis A (23.8-102.6) or Amoebic liver abscess (131-187.12), while the level of AS was lower in coinfection between amoebic liver abscess and Hepatitis A (32.12-50.1) than in Hepatitis A (23.8-102.6) or Amoebic liver abscess (131-187.12).

Table (6) Liver enzyme concentrations in patient with Hepatitis A , Amoebic liver abscess and coinfection between amoebic liver abscess and Hepatitis A

biochemical markers	Hepatitis A	Amoebic liver abscess	coinfection between amoebic liver abscess and Hepatitis A
ALP(U/L)	69.12-452.7	131-187.12	35-322.8
ALT(U/L)	23.8-102.6	32.12-50.1	9.19-812.2
AST(U/L)	30.454-80.5 0	20.87-67.5	330.2-655
TSB (mg/dl)	1.11-6.42	0.12-3.32	1.12-5.67

Hematological parameters

There was a higher concentration of ALT in coinfection between amoebic liver abscess and Hepatitis A (9.19-812.2) compared to Hepatitis A (23.8-102.6) or Amoebic liver abscess (131-187.12), while the level of AS was lower in coinfection between amoebic liver abscess and Hepatitis A (32.12-50.1) than in Hepatitis A (23.8-102.6) or Amoebic liver abscess (131-187.12).

Table (7) biochemical markers concentrations in patient with Hepatitis A , Amoebic liver abscess and coinfection between amoebic liver abscess and Hepatitis A

biochemical markers	Hepatitis A	Amoebic liver abscess	coinfection between amoebic liver abscess and Hepatitis A
WBC (1000/mm3)	6.5-9.4	3.4-16	5.5-10.3
Hb(gm/dl)	7.09-13.89	9.01-18.43	5.09-14.33
PCV (%)	31.21-41.34	22.78-44.7	23.4-49.87
PLT(%)	78.23- 218.2	91.23-187.32	80.23-286.3

DISCUSSION

Hepatitis A virus (HAV) infection and amoebic liver abscess have a similar mode of transmission (fecal-oral route) and similar epidemiology. Either of these diseases may be considered in patients with clinical signs and symptoms of liver disease in areas of the world where hepatitis and *Entamoeba histolytica* are endemic. The following two cases describe patients with concurrent HAV infection and amoebic liver abscess. This report emphasizes the role of dual infection in patients coming from endemic areas. It also challenges the assumption that jaundice in patients with amoebic liver abscess is a consequence of amoebic hepatitis, rather than co-infection with viral hepatitis ^(24,25). The results of the current study show that the co-occurrence is in females at young ages, and this is consistent

with²⁶ the young patients suffering from amoebic liver abscess and HBV being more. The disease is more likely to present in the acute phase than in older patients. With prominent symptoms for less than 10 days. Most Patients suffer from fever and pain in the right upper quadrant. Which may be dull or lateral in nature and may radiate

To the shoulder. Suprahepatic point pain and right-sided pleural effusion are common. Jaundice is rare. Although the primary site of infection is the colon, it is less common. More than a third of patients with amoebic abscess suffer from it. Active diarrhea.³ The present study showed that females were more affected than males, although the difference was not statistically significant. Some observations have explained the reasons for this difference

in prevalence between males and females, as most families prefer maids over males for cultural, religious, and traditional reasons [19]. Similar results on the distribution of *E. histolytica* by sex were observed in a study by Sami [10]; This study demonstrated that *E. histolytica* infection was higher in females than in males, indicating that females are more likely than males to carry asymptomatic infection rather than to develop invasive disease. The results of this study also support a study by Jamila [20], which found similar results of higher *E. histolytica* infection in females compared to males. Cytokines are important mediators of host immune response. They can be used as markers to identify the immunological mechanisms underlying the outcomes of amoebic infection and HBV [27] showed that IL-2, 8 and 10 serum levels were significantly increased in patients, indicating that the invasion of the liver tissue by *E. histolytica* elicits an anti-inflammatory immune response. A high level of serum interleukin-2, 8, 10 is a sign of a more serious condition, such as amoebic liver abscess, hepatitis A, or coinfection between amoebic liver abscess and hepatitis A. Furthermore, a greater mortality rate is associated with both a stable and dynamically raised level of serum IL-2, 8, 10^(18,19,20). Many hematological and biochemical problems have been reported. The impact of hepatitis B virus infection and hepatocyte function is well documented. These are measured by serum AST, ALT, ALP, and TSB. It may be due to increased circulating liver enzymes. Synthesis and secretion, or reduction of catabolism [11]. The concentration of liver enzymes inside the leaked cells. Blood circulation is indicated by serum amino transferase. Such as ALT and AST. This is hepatocyte injury markers [12, 13]. Since ALT has a cytoplasmic distribution. Longer half-life in the blood (about 50 hours) than AST, it is the most reliable biochemical measurement for detection of liver

dysfunction in patients suffering from acute and chronic conditions.

Viral hepatitis, (about 16 h)^[14, 15]. In hepatitis C and amoebiasis co-infection, it is of high importance. Elevations in ALT were detected at ($P \geq 0.05$) in comparison to control; These findings are consistent with those found by others.

This result is comparable to that found in^[3, 16, 17]. This result can be explained by the fact that the liver is the target organ to multiply the hepatitis B virus, leading to the destruction of liver cells. As a result, there is an increase in the release of these molecules¹². Similar to the results of a previous study, there are positive ones, Bilirubin levels were not correlated with abscess size^(21,22,23).

CONCLUSION

The fecal-oral route of transmission for hepatitis A virus (HAV) infection and amoebic liver abscess is the same, and their epidemiology's are comparable. In regions of the world where hepatitis and *Entamoeba histolytica* are endemic, patients presenting with clinical signs and symptoms of liver disease may be treated for either of these conditions. The two examples that follow show patients who had an amoebic liver abscess and HAV infection at the same time. The importance of dual infection in patients from endemic locations is highlighted in this article. It also calls into question the notion that viral hepatitis is more likely to co-infect patients with amoebic liver abscesses than amoebic hepatitis is.

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