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Research Article

SOI: <http://s-o-i.org/1.15/ijrcrps-2016-3-3-4>Lipid profile level in patients infected with *Entamoeba histolytica*

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Abstract

The study was carried out during the period from the beginning of (November / 2013 - November / 2014) for detection of *Entamoeba histolytica* in patients with age range from (3-60) year who attended to AL-Yarmouk teaching hospital and AL-Tifil central hospital. The diagnosis done by microscopic examination. A total of 200 suspected patient there was 120 infected with the parasite diagnosed by the direct examination method, a blood sample was taken from each one, as well as (60) healthy controls were involved in the study, which included: Lipid profile measurement by spectrophotometric method. The results indicated: The prevalence of *Entamoeba histolytica* by using microscopic examination was 145 (72.5%). Lipid profile results showed significant increased ($P < 0.05$) in patients sera level of cholesterol, triglyceride and low density lipoproteins, while high density lipoproteins showed decreased level in comparison to healthy control.

أجريت الدراسة للفترة من تشرين الثاني • ولغاية تشرين الثاني • للتحري عن تواجد الاميبا الحالة للنسيج لدى المرضى الذين تتراوح اعمارهم بين (-) سنة والمراجعين مستشفى البرموك التعليمي ومستشفى الطفل المركزي في بغداد وفيها تم التشخيص باستخدام طريقة الفحص المباشر ' مريض لديهم اعراض المرض تم تشخيص (•) وتم جمع عينة دم لكل من المرضى المصابين بالاميبا الحالة للنسيج و (•) عينة دم من السيطرة ا شملت الدراسة قياس مستوى الكوليستيرول والدهون الثلاثية والدهون عالية الكثافة وعالية الكثافة جدا وقد أظهرت النتائج ما يأتي ○ تواجد طفيلي الاميبا الحالة للنسيج عند الكوليستيرول والدهون الثلاثية والدهون $P > 0.05$ والدهون معنوية بينما الدهون عالية معنوية بالسيطرة () .

Keywords: *Entamoeba histolytica*, Lipid profile.

Introduction

Entamoeba histolytica is a protozoan parasite that causes amoebic dysentery and liver abscess. The disease is still one of the major health problems and predominantly affects individuals of lower socioeconomic status who live in developing countries [1, 2, 3]. Infections can be intestinal, extra intestinal, or both. Most cases are intestinal and asymptomatic. Symptoms, when occur, are multiple and varied, ranging from mild abdominal discomfort and diarrhea (often with blood and mucus) alternating with periods of remission or constipation, to severe illness with fever, chills, and significant bloody or mucoid diarrhea ("amoebic dysentery"). Amoebic colitis may be confused with inflammatory bowel disease such as ulcerative colitis [4].

Cholesterol is a precursor of bile acids, steroid hormones, and vitamin D. It is therefore of critical importance that the cells of the body be assured an appropriate supply of cholesterol. The liver plays a central role in the regulation of the body's cholesterol homeostasis; cholesterol enters the liver's cholesterol pool from a number of sources including dietary cholesterol, as well as cholesterol synthesized de novo by extra hepatic tissues and by the liver itself. Cholesterol is eliminated from the liver as unmodified cholesterol in the bile, or it can be converted to bile salts that are secreted into the intestinal lumen. It can also serve as a component of plasma lipoproteins sent to the peripheral tissues. In humans, the balance between

cholesterol influx and efflux is not precise, resulting in a gradual deposition of cholesterol in the tissues, particularly in the endothelial linings of blood vessels [5]. Triglyceride is an ester derived from glycerol and three fatty acids [6]. As a blood lipid, it helps enable the bidirectional transference of adipose fat and blood glucose from the liver. There are many triglycerides depending on the oil source, some are highly unsaturated and some less so. Saturated compounds are "saturated" with hydrogen - all available places where hydrogen atoms could be bonded to carbon atoms are occupied. Unsaturated compounds have double bonds (C=C) between carbon atoms, reducing the number of places where hydrogen atoms can bond to carbon atoms. Saturated compounds have single bonds (C-C) between the carbon atoms, and the other bond is bound to hydrogen atoms (for example =CH-CH=, -CH₂-CH₂-, etc.) [7].

High-density lipoprotein (HDL) is one of the five major groups of lipoproteins. Lipoproteins are complex particles composed of multiple proteins which transport all fat molecules (lipids) around the body within the water outside cells. They are typically composed of 80-100 proteins/particle (organized by one, two or three Apo- A; more as the particles enlarge picking up and carrying more fat molecules) and transporting none to hundreds fat molecules/particle. Unlike the larger lipoprotein particles which deliver fat molecules to cells, HDL particles remove fat molecules from cells which want to export fat molecules. The fats carried include cholesterol, phospholipids, and triglycerides; amounts of each quite variable.

Lipoproteins, in order of molecular size, largest to smallest, are chylomicrons, very low-density lipoprotein (VLDL), intermediate-density lipoprotein (IDL), low-density lipoprotein (LDL), and HDL. Lipoprotein molecules (all particles far smaller than human cells), enable the transportation of all lipids, such as cholesterol, phospholipids and triglycerides, within the water around cells (extracellular fluid), including the bloodstream.

High-density lipoprotein (HDL) particles, unlike the larger particles, transfer fats away from cells, artery walls and tissues (around the body, body wide) through the bloodstream, back to both (a) LDL particles and (b) back to the liver for other disposition.

Increasing concentrations of HDL particles are strongly associated with decreasing accumulation of atherosclerosis within the walls of arteries [8].

The study aimed to well understand the role of lipids in the infections and invasiveness of *Entamoeba histolytica*

Materials and Methods

Studied groups

The study carried out during the period from (November 2013- November 2014), the age of patients extended from (3 – 60) years, two studied groups were involved:

- Suspected patients: Blood and stool samples were obtained from a total of 200 patients clinically suspected with amoebic dysentery that had been examined and defined as suspected cases by specialized physician; the samples were collected from (Al-Yarmouk teaching hospital & Al-Tifil central hospital) in Baghdad.
- Healthy Control: Blood and stool samples from a total 60 healthy control group were involved from Al-Yarmouk teaching hospital staff and from different places in Baghdad; they were examined and defined as healthy, with no history of amoebic dysentery.

Samples collection

Stool sample from each patient was collected in a clean, dry tight cover container and examined with a half an hour. The samples were examined for the presence of *E. histolytica*.

Stool sample examination

Macroscopic examination

It was performed by observing the consistency of stool, presence of blood, mucous and other substances.

Microscopic examination

For each stool sample, wet mount preparation slide was examined by clean, dry slides by obtaining one drop of normal saline and small amount of stool from different places of stool by using clean wooden stick, especially when blood or mucous were noticed, then mixed gently with normal saline and covered with cover slip, the slide was examined under the low (10x) and high power (40x) of microscope. [9]

Blood samples

Five mL of Venous blood was obtained from each patient and collected in sterilized screw cap plastic tube, blood samples were left for 30 min. at room temperature, then centrifuge at 3000 rpm for five minute, then the serum for each sample was collected in Eppendorf tubes and stored in deep freeze at -20c° until the time for using. The current study included some Biochemical aspects:

One hundred twenty clinical patients of *E.histolytica* and (60) healthy control involved in the study. The levels of cholesterol, triglycerides were examined by spectrophotometric method according to [10].

The levels of HDL, LDL were examined by spectrophotometric method according to [11].

Statistical analysis: The statistical Analysis (T – test) was used to compare between means in studied groups according to [12].

Results and Discussion

Cholesterol

The level of total cholesterol in patients sera with *E.histolytica* showed significant increasing ($P<0.05$) in

comparison with healthy control. Also, the results showed non-significant difference ($P>0.05$) between the gender in both groups. It was (194.11 ± 4.37), (220.87 ± 5.85) in males and females of patients group respectively against (156.78 ± 0.78), (161.74 ± 1.38) in males and females of control group respectively Table (1).

These results are in agree with another study done by [13] who stated elevation of cholesterol in patients suffering from parasitic infection. In general, the cholesterol is very important in adhesion and considered as virulence factor for *E. histolytica* [14].

Table (1): The level of cholesterol (mg/dL) in patients with *E. histolytica* and healthy control

Group	Mean \pm S.D Gender	
	Males	Females
Patients	194.11 \pm 4.37	220.87 \pm 5.85
Control	156.78 \pm 0.78	161.74 \pm 1.38
T-test value	11.68 *	18.03 *

* ($P<0.05$)

High Density Lipoprotein (HDL)

The level of High Density Lipoprotein in patients sera with *E.histolytica* showed significant decreasing ($P<0.05$) in comparison with healthy control. While the results showed non-significant difference ($P>0.05$) between the gender in both groups. The level of HDL was (43.12 ± 0.17), (42.69 ± 0.17) in males and females of patients group respectively in comparison

to (49.70 ± 0.91), (50.51 ± 0.99) in males and females in healthy control group respectively Table (2).

The decreasing of HDL occurs in patients harboring the parasite and with active infection membrane protein and probably involved as the parasite metabolize the lipoprotein which may indicate the rate of lipoproteins in pathogenesis of *E. histolytica* becomes more virulent in the presence of lipoproteins [15].

Table (2): The level of HDL (mg/dL) in patients with *E. histolytica* and healthy control

Group	Mean \pm S.D Gender	
	Males	Females
Patients	43.12 \pm 0.17	42.69 \pm 0.17
Control	49.70 \pm 0.91	50.51 \pm 0.99
T-test value	1.41 *	1.39 *

* ($P<0.05$)

Low Density Lipoprotein (LDL)

The level of LDL in patients sera with *E. histolytica* showed statistically increasing ($P<0.05$) in patients in comparison with healthy control group. While the

results showed non-significant differences ($P>0.05$) between the gender in both groups .It was (183.74 ± 0.51), (184.41 ± 0.59) in males and females of patients group respectively, against (139.95 ± 0.68), (139.86 ± 0.94) in males and females of healthy control group respectively Table (3).

The present study is in disagree with another study done by [15] who found that low density lipoprotein

level is lower than healthy controls in *E. histolytica* cyst passers and amoebic liver abscess patients.

Table (3): The level of LDL (mg/dL) in patients with *E. histolytica* and healthy control

Group	Mean \pm S.D Gender	
	Males	Females
Patients	183.74 \pm 0.51	184.41 \pm 0.59
Control	139.95 \pm 0.68	139.86 \pm 0.94
T-test value	1.69 *	2.16 *

*(P<0.05)

Triglyceride

The level of Triglyceride in patients sera with *E. histolytica* showed significant increasing (P<0.05) in comparison to healthy control. While the results showed non-statistically differences (P>0.05) in the level of Triglyceride between the gender in both groups. It was (156.48 \pm 0.45), (155.65 \pm 0.56) in males and females in patients respectively in comparison to (144.93 \pm 0.41), (146.40 \pm 0.43) in

males and females of healthy control group respectively Table (4). Triglyceride are rebuilt in the enterocytes from their fragments and packaged together with cholesterol and proteins to form chylomicrons. Triglyceride is a major components of very low density lipoproteins (VLDL) and chylomicrons, play an important role in metabolism as energy sources and transporters of dietary fat [16].

Table (4): The level of triglyceride (mg/dL) in patients with *E. histolytica* and healthy control

Group	Mean \pm S.D Gender	
	Males	Females
Patients	156.48 \pm 0.45	155.65 \pm 0.56
Control	144.93 \pm 0.41	146.40 \pm 0.43
T-test value	1.36 *	1.80 *

*(P<0.05)

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