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Hematological and Biochemical Levels in Patients with *Cutaneous Leishmaniasis* in Thi-Qar province-Iraq

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Abstract

This study was conducted in AL-Nasiria city ThiQarn province to evaluate the hematological and biochemical parameters of patients with (Cutaneous Leishmaniasis) (CL).In This study, 5 ml venous blood was collected from 49 individuals aged from 18 to 45years , 29 patients had(CL) and 20 free from CL were used as a control. Whole blood used for calculated WBC_s count, differential WBC_s count, RBC_s count, hemoglobin concentration, hematocrit, and platelets count. While Serum used for calculated biochemical parameters such as liver enzymes and lipid profile after statistical analysis of the results showed no n significant differences in differential WBCs count and RBCS indices. on other hand a significant increase in triglycerides, cholesterol, high-density lipoproteins and very low lipoproteins in patients with CL as compared with controls. Results of liver enzymes showed a significant decrease in ALT and non significant difference in AST. ***Key Word*: Cutaneous Leishmania , Hematological Status , Biochemical Status**

Introduction

Leishmaniasis is a major health problem worldwide, endemic in 98 countries and around 1.3 million new cases are reported every year, with an estimated 20,000 to 40,000 deaths every year (Nasir *et al* ,.2014). Leishmaniasis is caused by obligate interior macrophage protozoa and is transmitted by infected female sand flies, the disease phenotypes include visceral leishmaniasis, cutaneous leishmaniasis , post-kala-azar dermal leishmaniasis, and mucosal leishmaniasis (Murray *et al*., 2005).The symptoms of leishmaniasis can showed within weeks to months after being inoculated with this parasite (Wiwanitkit, 2012). The clinical signs of the disease are attributed to the severity of the immune response of the host. The cellular immune response against the disease is fundamental and vitally important The macrophages, neutrophils and other phagocytes cells that are key components of the antimicrobial and tumoricidal immune responses (Khocyigit *et al*., 2003).

Cutaneous leishmaniasis (CL)

Cutaneous leishmaniasis (CL) is the most common and least fatal form of the disease, identified by ulcerative skin lesions.(CL) is caused by *Leishmania major, L. tropica, L. braziliensis , L.*

panamensis., L. aethiopica, L. mexicana,, L. guyanensis, L. peruviana, and *L. amazonensis* (Reithinger *et al.*, 2007).

As there is two types of Cutaneous Leishmaniasis in Iraq, zoonotic and anthroponotic CL (Postigo,2010) , It usually occurs as a single cutaneous disservice on exposed body parts (face and upper limb) and varies in size from nodules to large ulcers ,that leading to deformation scars. Therefore the treatment early and effective is very important for a good clinical outcome. To date, no effective vaccine exists, and the current drug formulary is limited by toxicity, increasing resistance, and costly long treatment regimens. The ideal low cost treatment should kill parasites rapidly and accelerate tissue repair by combining pharmacological with immuno-therapeutic approaches (Mahajan & Sharma, 2007; Reithinger *et al.*, 2007; Karina *et al* ., 2011). Peripheral blood picture evolution has often been discussed in patients with Visceral Leishmania but it has not been widely investigated in Cutaneous Leishmania (Salwa *et al*., 2014).

Material and Patients

Sample collection

This study done in the period from January to May/2016 in Al-Hussein teaching hospital/ ThiQar province-Iraq. The venous blood was collected from 40 patients that have a cutaneous leishmania with the age range (18-45) years. The controls including 20 persons corresponding to the patients in the age range.

Hematological parameters

These parameters were calculated automatically via a hematology analyzer (Cell-Dyn Ruby-England) which included the followings: WBC_s count, differential WBC_s count, RBC_s count, hemoglobin concentration, hematocrit, and platelets count.

Biochemical parameters

The photometric method used to analysis these parameters in the patients serum and controls by using commercial kits (Biolabo-France) which include: alanine trans aminase (ALT), Aspartate transaminase (AST) and lipid profile tests (cholesterol, triglycerides, high density lipoprotein, low density lipoprotein and very low density lipoprotein).

Statistics analysis

Statistical analysis was done by using SPSS program (ANOVA).

Result and discussion

1. Hematology analysis :

Peripheral blood picture evolution has often been discussed in patients with visceral leishmania but it has not been widely investigated in cutaneous leishmania (Salwa *et al*., 2014). By examining the blood of patients with CL results showed there are no significant changes in differential white blood cells table 1 . While Herwaldt ,(1999) has said the first move defensive faced parasite when it entered the host are WBC_S. Salwa *et ,al* .,(2014) suggested CL might causes significant increase in WBC's count . on the other hand there is non significant increase in eosinophils cells table 1.osinophils have been associated with immune responses to helminthic parasites . Usually, eosinophils are not implicated in the immune response against protozoa because their levels are not elevated during these infections. However, several lines of evidence support the involvement of eosinophils during infection with the Leishmania spp. Protozoa (De

Oliveira *et al.*,2010). Suha ,(2010) recorded decrease Lymphocyte number and increase in eosinophil number in mice infected with leishmania .

Table (1): Mean ± St. D for white Blood Cells values for patients and control.

Name	Number	Mean ± St. D				
		Neutrophils	Basophils	Eosinophils	Monocytes	Lymphocyts
Patients	29	53.40± 14.39	1.16±0.74	5.59±3.48	7.4±3.48	34.58±10.87
Control	20	50.20± 7.22	0.83±0.17	2.25±0.85	7.74±1.19	38.98±5.85

* $P \leq 0.05$

Table (2) shows no significant changes for all parameter of red blood cells indices(RBCs, HB, PCV, PLT) in all patients compared with controls and these results correspond with (Salwa *et al* ., 2014) when they had noticed no significant changes in PLT count and Hb concentration in patients infected with CL compared to controls. While (Alexandre *et al*.,2006) they had noticed changes in the blood pictures of infected animals with leishmania represented by significant decrease in RBCs, HB, PCV, PLT and total count of WBC_s . There is also a non agreement between the results of the present study and the study by Dawood (2008) where he noted decreased HB, PCV, PLT and total count of WBC_s in infected patients.

Table (2): Mean ± St. D for some hematological parameters for patients and control .

Name	Number	Mean ± St. D				
		$RBCs \times 10^6$ /ML	$WBC_S \times 10^9$/l	HB g/dl	PCV%	$PLT \times 10^3$ / mm^3
Patients	29	4.78±0.50	8.95±2.43	13.88±1.86	40.12±4.85	241.59±63.03
Control	20	5.02±0.66	7.73±1.68	14.04±1.90	43.20±5.92	220.80±82.54

* $P \leq 0.05$

2. Biochemical Analysis

Table (3) reveals significant increase in serum lipoprotein values of all patients compared with control. Bansal *et al*.,(2005) had recorded there is relationship between parasitic infection and lipoprotein specially cholesterol . In patients suffering from malaria infection there is elevated in serum HDL and total cholesterol (Faucher *et al* ., 2002) . One of most typical changes in lipoprotein metabolism during infection and inflammation is hypertriglyceridemia (Khovidhunkit *et al*.,2000).however ,results of the present study were in agreement with Ramazan *et al*.,(2011) showed that Statistically significant increases in serum cholesterol, and VLDL levels were observed in leishmania infected group when compared to controls. Plasma lipoproteins (VLDL, LDL, and HDL) have important functional roles primarily in lipid transport among tissues and

organs Besides that participate in innate immunity, since they have broad preventive effects against bacterial, viral and parasitic infections (Han,2010).

Table(3): Mean ± St. D for lipoprotein in Serum patients and control.

Name	Number	Mean ± St. D				
		Tri mg/dl	Chol mg/dl	HDL mg/dl	LDL mg/dl	VLDL mg/dl
Patients	29	177.31±43.08*	207.69±41.68*	81.10±23.75*	74.83±18.85*	36.17±8.25*
Control	20	112.00±5.70*	181.00 ±7.38*	44.60±3.85*	109.20±4.76*	22.40±1.14*

* $P \leq 0.05$

Table (4): Mean ± St. D for Liver enzymes in patient and control.

Name	Number	Mean ± St. D	
		AST U/L	ALT U/L
Patients	29	8.86±5.02	5.41±2.57*
Control	20	9.80±1.48	11.00±3.54*

* $P \leq 0.05$

Table (4) recorded significant decrease in serum level of ALT in patients compared with control $P \leq 0.05$, at same time there is no significant difference in AST as compared with control . results of the present study were in agreement with Kashani *et a.,l*(2007) reported non-significant change in the levels of AST in CL patients. Also the present study were disagreement with Dawood (2008) reported increase ALT. The alterations in lipid have not been fully understood in patients suffering from CL. The lack of significant increase of AST, ALT and bilirubin reflect the normal liver function and absence of Visceral leishmania among patients (Kashani *et al.*,2007). Through all the results we have obtained from the current study could explain the result of changes to the intake of patients for certain types of treatments that may lead to a change in the measured variables (hematological and biochemical) This is consistent with a study conducted by suha,(2010).

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