

The effect of visceral leishmaniasis on some liver enzyme and blood parameter

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Abstract

A total of 121 confirmed cases of visceral leishmaniasis admitted in Thi-Qar children hospital which is diagnosed by bone marrow aspiration were describe, most of them are less than two years old (82.6%). The common biochemical features of patients blood show an increase in bilirubin and erythrocyte sedimentation (ESR) and decrease in packed cell volume (PCV). Liver enzyme (ALT and ATS) increasing in severity cases.

Introduction

Human visceral leishmaniasis, caused by protozoan of the genus *Leishmania*, is a zoonotic disease whose main reservoirs are dogs (Gomez-Ocgoa, *et al.*, 2003). Visceral leishmaniasis a potentially fatal disease and it is the second largest parasitic killer in the world, it is an infectious and responsible for an estimated 60,000 who die from disease every year, out of half million infection worldwide (Wikipedia, 2006). An estimated 200 million people are at risk of contacting the disease, with approximately 100,000 new cases annually. The leishmaniasis is now endemic in 88 countries, in five continents Africa, Asia, Europe, North and South America (WHO, 2000).

The disease was transmitted by the bite of the infected female *Phlebotomine* sand flies, and caused by various species parasite. The sand fly vector is usually infected with one species of protozoan parasite (Ashford, *et al.*, 1992).

The parasite were found intracellular in the reticuloendothelial system as the amastigote form in vertebrate, which is a flagellate, round, and 2-4 μ m diameter in the vector, the promastigote form is flagellate, spindle shape, and 15-20 μ m in length (WHO, 1998).

Parasitized macrophage disseminated infection to all parts of the body but more so to the spleen, liver and bone marrow. The spleen is enlarged with a thickening of the capsule, it is soft and fragile. In the liver, the Kupffer cells are increase in size and number and infected with amastigote forms of *Leishmania*,

bone, bone marrow turns hyper plastic and parasitized macrophages replace the normal hemopoietic tissue (Grech, *et al.*, 2000; Vidyashankar, 2002)

The present study is designated throw more light on the variable of liver function and some hematological parameter in the visceral leishmaniasis (VL) cases.

Material and method

All cases (121) of visceral leishmanias was notified in the period from January to October 2007. It was collected from Thi-Qar children hospital, with age (0.5-5) years. The cases were confirmed parasitological by the examination of bone marrow (WHO, 1996).

About 5 ml venous blood samples were obtained from all patients. About 1.5 ml was added to sodium citrate anticoagulant tubes for Erythrocyte sedimentation rate (ESR) measurement which was carried by the Westergren method and Packed cell volume (PCV) was estimated by the microhaematocrit method (Baker, and Silvertan, 1976). The remainder was allowed to clot in a clean plain tube for 20-30 minutes at room temperature. The serum was recovered by centrifugation for measuring, bilirubin and albumin within 1-3 hours.

Biochemical parameters:

ALT and ATS in serum was measured by the method of (Reitman, and Frankel, 1957). Which is based on transamination of glutamic-pyruvic by monitoring the concentration of pyruvate hydrozone formed with 2,4 dinitrophenyl hydrazine. Moreover, bilirubin was carried out by method of (Walters and Gerade, 1970) which is the coupling of bilirubin with diozoitized sulfanilic acid to form azobilirubin (purple- red in colour; the intensity of the colour is an index the bilirubin concentration).

In addition , albumin was estimated by the method of (Joan, *et al.* 1999). Chi (x^2) test was used for statically analysis in the present study.

Results

The present study shows that 82.6 % of the patients was less than two years of age. Some hematological indices show that the Packed cell volume show decrease (22%) than the normal value (30-40)%. Sedimentation rate was raised, this value was significant ($P<0.05$) with the normal value. Common biochemical features shown increase in bilirubin.

Alinine amino transferase (ALT) was increase in some sever cases reached to 170 IU/L, while Aspartate aminotransferase (ATS) so increase and reached to 97 IU/L (Table, 1).

Table (1): The value of Liver enzyme and hematological parameter of VL cases

Normal value	Maximum value	Minimum value	\pm SD	Mean	Parameter
0-13	135	12	\pm 31	83	ESR(mm/h)
30-40%	32	12	\pm 6.02	22	PCV (%)
<10	45	5	\pm 4	14	Bilirubin (μ mol/I)

33-47	46	3.1	±6.3	28.5	Albumin (g/l)
10-40	97	7	±21.3	20.5	ALT(IU/L)
33-47	46	3.1	±6.3	31.9	ATS (IU/L)

Discussion

The incidence of visceral leishmaniasis predominantly affected infants and young children in the South of Iraq (Jassim, 1998). The present study shows that the rate of infected children less than two years old was 82.6%. Similar results were registered in Saudia Arabia and Yemen (Patil, and Rodrigues, 1990; Rageh, 1990). In India and Africa the disease affect older children and adults (Grech, *et al.*, 2000). Therefore the disease in Iraq is though to be similar to the Mediterranean type due to its age distribution and the way of transmission.

The certain blood test of the present study is decreased of Packed cell volume. This may be indicated haemolysis in patients. Comparatively with present results similar rate of anemia, leucopenia and thrombocytopenia were observed in Iraq, Saudi Arabia, Pakistan and Sudan (Mehdi, 2004; Ashford, et al., 1992; Vidyashankar, 2002).

The people who have visceral leishmaniasis usually have fever, weight loss, and enlargement of liver and spleen (CDC, 2007). Hypergloubinaemia which results iron infection with *Leishmania* parasite leads to increase in total serum protein. This results does not seen a clear pathological role in visceral leishmsniasis infection (Grech, *et al.*, 2000). The increase of ALT and AST may result from the effect of parasite on the liver that cause hepatomegaly and then affects its function, a similar result was found by (Bhattacharyya, and Hati, 2004).

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تأثير مرض الحمى السوداء على بعض انزيمات الكبد
وبعض المؤشرات الدموية

الخلاصة

تم وصف 121 حالة طفل مصاب بالحمى السوداء والمؤكد تشخيصهم بواسطة نخاع العظم. ووجد ان ٨٢,٦% تحت السننتين من العمر. فقد لوحظ انخفاض في حجم الدم المضغوط (PCV) وارتفاع معدل سرعة ترسيب الدم ESR وزيادة البليروبين. كما اظهرت الدراسة الحالية زيادة في بعض انزيمات الكبد في حالات الاصابة الشديدة.