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# Some haematological and biochemical indices study of visceral leishmaniasis in the Southern parts of Iraq

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## *Abstract*

A total of 114 confirmed cases of visceral leishmaniasis which is diagnosed by bone marrow aspiration at Basrah and Thi-Qar children hospitals were described, most of them are less than two years old. The majority of the patients suffered from leukopenia (97%) with increase in lymphocyte and monocyte numbers. Common biochemical features of the patients bloods show an increase in bilirubin. Liver enzymes (ALT and ATS) increasing in severity cases.

**Key words**: Leishmaniasis, albumin, ESR, ALT, ATS.

## *Introduction*

Visceral leishmaniasis (VL) is an infectious disease transmitted by the bite of the infected female phlebotomine sandflies, and caused by various species parasite. The sandfly vector is usually infected with one species of protozoan parasites belonging to the genus *Leishmania* [1].

Recently, [2] mentioned that leishmaniasis is now endemic in 88 countries, in five continents Africa, Asia, Europe, North America, and South America, with total of 350 million people at risk. Five hundred thousand new cases of VL occur every year. Currently, it is believed that 12 million cases of all forms of the disease exist worldwide – only approximately one- third of new cases are ever officially declared.

The parasites were found intracellulary in the reticuloendothelial system as the amastigote form in vertebrates, which is aflagellate, round, and 2-4 µm in diameter, In the vector, the promastigote form is flagellate, spindle shaped, and 15-20 µm in length [3].

The disease begins with fever , malaise and is followed by wasting, enlarged spleen and liver and finally death in about two to three years if did not treated [4 , 5]. Laboratory studies demonstrate a pancytopenia (normocytic anaemia, leukopenia, and thrmbocytopenia), hypergamaglobinemia, and a low albumin. Malabsorption and malnutrition may also be seen[6].

In Saudi Arabia, reported the majority of patients were anaemic with Hb < 9 g/l in 98.3 % of cases leukopenia, thrombocytopenia, and IgG was increase in 92.6 % of patients [7]. Laboratory indices were common abnormalities in the patients with VL cases [8].

The present study is designated to throw more light on the variables of haematological, biochemical indices and liver function test in the VL cases.

## *Methods*

All cases (114) of VL notified between 2001 / 2003 were identified from Basrah and Thi-Qar children hospitals. Age of patients was recorded and the cases were confirmed parasitologically by examination of bone marrow in hospitals [9]. Laboratory recorded data included total leukocytes, neutrophil, lymphocyte, monocyte count. Erythrocyte sedimentation rate (ESR), Packed cell volume (PCV), albumin and bilirubin were estimated. Moreover, liver function was tested by ALT and ATS estimated. Chi ($x^2$) test were used for statically analysis in present study.

## *Results*

The present study shows that 89.4% of the patients were less than two years of age. haematological and biochemical indices show the majority of patients were suffering from leukopenia in 97 % of cases with WBC 3.8 x $10^9$. These values were significant with the normal value ($P<0.05$) (Table. 1).

**Table (1): The value of haematological and biochemical indices of VL cases**

| Blood parameter | mean | SD | Minimum value | Maximum value | Normal value |
|---|---|---|---|---|---|
| Neutrophil count (%) | 24.5 | ±9.9 | 9 | 67 | 54-62 |
| Lymphocyte count %) | 63 | ±11.2 | 19 | 88 | 25-33 |
| Monocyte count (%) | 10.2 | ±5.1 | 3 | 32 | 3-7 |
| WBC x10 $^9$/l | 3.8 | ±1.2 | 1 | 8.2 | 6 – 18 |
| ESR (mm/h) | 83 | ±31 | 12 | 135 | 0-13 |
| PCV (%) | 22 | ±6.02 | 12 | 32 | 30-40% |
| ALT (IU/L) | 20.5 | ±21.3 | 7 | 97 | 10-40 |
| ATS (IU/L) | 31.9 | ±40.8 | 7 | 170 | 10-35 |
| Bilirubin (µmol/l) | 14 | ±4 | 5 | 45 | <10 |
| Albumine (g/l) | 28.5 | ±6.3 | 3.1 | 46 | 33-47 |

The lymphocyte and monocyte found more numbers from normal. Packed cell volume show a decrease. Common biochemical features show an increase in bilirubin. Erythrocyte sedimentation rate (ESR) also was raised in patients. Alinine aminotransferase (ALT) was increased in some sever cases reached to 170 IU/L and aspartate aminotransferase (ATS) also increased to 97 IU/L.

## *Discussion*

The incidence of VL predominantly affected infants and young children in the south of Iraq [10, 11]. The present study shows that the rate of infected children less than two years old was 89%. Similar results were registered by in Saudi Arabia and Yemen [12, 13]. In India and Africa the disease affect older children and adults [3]. Therefore the disease in Iraq is thought to be similar to the Mediterranean type due to its age distribution and the way of transmission. The main haematological and biochemical indices of the present study are typical with leucopenia, with increase of bilirubin. These results were in agreement with other studies from Malta, Saudi Arabia, Pakistan, Sudan and Brazil [4, 7,14,9]. Packed cell volume was decreased on this may be indicate haemolysis in patients. Comparatively with present results similar rate of anaemia, leukopenia and thrombocytopenia was observed in Sudan (75, 85, 75)% and in Nepal (95,60,75)% respectively by [9,15].Leukopenia might be from reduction of its life span, causing granulocytopenia or from bone marrow suppression [4]. Hyperplasia was found in patients following infection with *Leishmania* organism which subsequently the liver, spleen and lymphoid tissue [16]. Hypergloulinaemia which results from infection with *Leishmania* parasite leads to an increase in total serum protein. This result dose not seen to have a clear pathological role in VL infection [3]. The increase of ALT and ATS may result from the effect of parasite on the liver that cause hepatomegaly and then affects its function, a similar result was found by [17].

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**الخلاصة**

تم وصف 114 حالة طفل مصاب بالحمى السوداء DAT والمؤكد تشخيصهم بواسطة فحص نخاع العظم. وجد إن 97% من الأطفال ينخفض لديهم معدل عدد كريات الدم البيض مع وجود زيادة في المونوسايت والخلايا اللمفية مقارنة بالعينات الضابطة. لوحظ في النتائج أيضا زيادة في بعض المؤشرات الكيموحياتية كما في ارتفاع البليروبين، كما أظهرت الدراسة زيادة في بعض إنزيمات الكبد في بعض حالات الإصابة الشديدة.

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