

Epidemiological and Clinical Study of Visceral Leishmaniasis in Najaf and Karbala Governorates

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Abstract

A retrospective study conducted on (63) patients with V.L. admitted to both Al-Zahraa' Maternity and Pediatrics Hospital (MPH) in Al-Najaf and Karbala' Hospital for Children during the period from Jan. 2005 to Sep. 2006 to shade light on the epidemiological and clinical aspects of V.L. among children from both governorates.

The number of male cases was 43 (68.2%), while female cases were 20 (31.7%), male to female ratio was (2.1:1). Most of cases were registered during winter and spring months. 39 (62%) of cases came from rural areas. The peak ages incidence were 1 – 3 years (65%). The commonest presenting features were fever (100%), splenomegaly (93.6%), and pallor (87.3%).

The consistent laboratory findings were anemia (87.3%) and leucopenia (58.7%). Bone marrow aspirate were positive in 40 (81.6%) from 49 aspirates taken and 14 (22.2%) patients were treated without bone marrow aspirate confirmation of the diagnosis

All the patients received sodium stibogluconate (Pentostam)[®] 20 mg/kg/day for 4 weeks. The main complications reported were jaundice (9.5%), pneumonia (6.3%), and gastroenteritis (4.7%). Three relapses (4.7%) have been documented. No deaths were reported.

Keywords: Visceral leishmaniasis, Kala azar

الخلاصة

في دراسة اشتملت على (63) مريضا مصابا بمرض الحمى السوداء (الليشمانيا الاحشائية) تم إدخالهم لكل من مستشفى الزهراء للنسائية والأطفال في النجف ومستشفى كربلاء للأطفال خلال الفترة الممتدة من كانون الثاني 2005 وحتى أيلول 2006 بهدف تسليط بعض الضوء على الجوانب الوبائية والسرييرية للمرض بين الأطفال من كلا المحافظتين. كان عدد الذكور المصابين 43 (68.2%) بينما كان عدد الإناث 20 (31.7%). وكانت نسبة إصابة الذكور إلى الإناث (1:2.1) معظم الحالات المرضية تم توثيقها خلال اشهر الشتاء والربيع. 62% من الحالات كانت من مناطق ريفية، وكانت أكثر الإصابات من الفئة العمرية 1 - 3 سنة (65%). كانت الأعراض السرييرية الأكثر شيوعا هي الحمى (100%)، فتضخم الطحال (93.6%)، ثم الشحوب بنسبة (87.3%). المشاهدات المختبرية الأكثر تكرارا اشتملت على فقر الدم (85.7%) وانخفاض عدد كريات الدم البيضاء (58.7%). كان فحص عينة نخاع العظم ايجابيا في 40 حالة (81.6%) من اصل 49 عينة تم فحصها، في حين تم علاج 14 مريضا (22.2%) دون الحاجة إلى فحص نخاع العظم لتأكيد التشخيص. تم علاج جميع المرضى باستخدام عقار الصوديوم ستيوغلوكونيت (بنتوستام) وبجرعة 20 ملغم/كغم/يوم ولمدة 4 أسابيع. المضاعفات الرئيسية التي تم توثيقها اشتملت على اليرقان (9.5%)، ذات الرئة (6.3%) والتهاب الأمعاء (4.7%). تم تسجيل 3 حالات (4.7%) تم إدخالها المستشفى لمرة ثانية، ولم تسجل أي حالة وفاة.

Abbreviations

MPH: Maternity & Pediatrics Hospital.
V.L.: Visceral leishmaniasis.
K.A.: Kalaazar.
LD: Leishman- Donovan.
IFAT: Indirect fluorescent antibody test.
SM: Splenomegaly
HM: Hepatomegaly



Introduction

Leishmaniasis are groups of diseases caused by obligate intracellular protozoa of genus leishmania.

Natural transmission of leishmania was carried out by certain species of sand fly of genus phlebotomus (old world) or lutozomyia (new world).

These are presented in three different forms:

- 1- Visceral leish.
- 2- Cutaneous leish.
- 3- Mucocutaneous leish.

The visceral form is also known as black sickness or kalaazar characterized by prolonged fever, splenomegaly, hepatomegaly, substantial weight loss, progressive anemia, pancytopenia and hypergammaglobulinemia, moreover, the visceral is complicated by serious infections^(1, 2, 3).

It is the most severe form of the disease, and usually fatal if it is untreated⁽⁴⁾.

V.L. is typically caused by *Leishmania donovani* complex which includes three species: *L. donovani*, *L. infantum* & *L. chagasi*^(5, 6).

Kalaazar (K.A.) is a major health problem in Iraq⁽⁶⁾. The disease has been known in Iraq since 1916 by Kulz who recorded 9 cases from Baghdad city⁽¹⁰⁾, and then many workers confirmed the endemicity of this disease in Iraq^(11,12).

The annual number of reported cases in Iraq is over 1000 and according to the data of K.A. section in the Endemic Disease Institute; the number of cases which was reported during the years 1971–1984 was 12038, about 90% of them were from Baghdad and central governorates. During the last few years there was an increase in V.L. cases in southern governorates of Iraq^(7, 8, 9, 10).

The endemicity of V.L. in Iraq is attributed to several factors including the location of Iraq in an area of Middle East where V.L. is endemic, the nature of habitat for the sand fly vectors, and the increased number of reservoir hosts. Furthermore, the

recent increase in the number of reported cases of V.L. in Iraq may reflect the education of the people and their awareness of the disease, so that many people now attend clinics for diagnosis and treat their children instead of trying to use popular remedies especially in rural areas⁽¹¹⁾.

Patients and Methods

A retrospective study was done on 63 patients during the period from Jan. 2005 – Sep. 2006 admitted to Al-Zahraa' MPH in Al-Najaf and Kerbalaa' Hospital for Children in whom a diagnosis of V.L. was documented.

The investigations of laboratory included Hb. estimation, WBC count (total and differential), blood film studies, platelet count, widal and brucella tests, L.F.T., CXR, dipstick for K.A., IFAT, and bone marrow examination. Bone marrow aspirate was taken using a bone marrow needle from posterior iliac crests and direct examination was done after staining with Leishman stain.

Diagnosis of cases was made depending, in addition to the clinical features, on the following:

- 1) Demonstration of LD bodies in bone marrow aspirates.
- 2) In cases in whom LD bodies were not seen, diagnosis was made based on the serological tests and other laboratory investigations which were highly suggestive of V.L. and on response to treatment (suggested by subsiding of fever, improvement of appetite and regression of splenic and hepatic enlargement).

The treatment regimen included sodium stibogluconate (Pentostam)[®] in a dose of 20 mg/kg was given IM in a single daily dose for 4 weeks.

Results

Among 63 patients who were studied, it was shown that the infection among males was

43 (68.2%), which was higher than that of females, which was 20 (31.7%), with a male: female ratio of about 2.1:1 (Fig. 1).

The ages of children ranged from 9 months to 10 years with the majority of cases between 1 to 3 years (Table 1).

Most of V.L. cases came from rural areas. These were 39 (62%) while 24 cases (38%) came from urban regions (Fig. 2).

The disease was noticed throughout the year, with the highest number of cases recorded during winter and spring months (Fig. 3).

All the patients were presented with fever (100%), vast majority- 59 cases- with splenomegaly (93.6%), anemia with Hb. < 10gm/dl in 55 cases (87.3%), hepatomegaly in 42 cases (66.6%),

jaundice in 6 cases (9.5%) and ascites in only one case (1.5%) (Fig. 4).

Regarding the complications, hepatitis was observed in 6 cases (9.5%). pneumonia in 4 cases (6.3%), gastroenteritis in 3 cases (4.7%), and Bone marrow studies were done for 49 patients (77.7%), of which 40 patients (81.6%) were positive for LD bodies (Fig. 5).

Variable degrees of anemia were detected in 55 cases (87.3%).

Blood transfusion was given to 19 patients (30.1%). Leucopenia ($WBC < 4000 \text{ c/mm}^3$) was observed in 37 patients (58.7%), normal WBC count ($4000-14000 \text{ c/mm}^3$) in 20 patients (31.7%), and leukocytosis ($> 14000 /\text{mm}^3$) in 6 patients (9.5%). Thrombocytopenia was detected in 8 patients (12.6%) (Table 2).

Table 1: Age distribution of 63 patients with K.A

Age	Number	Percentage
< 1 yr.	14	22.3
1 – 4 yrs.	38	60.3
≥ 4 yrs.	11	17.4
Total	63	100

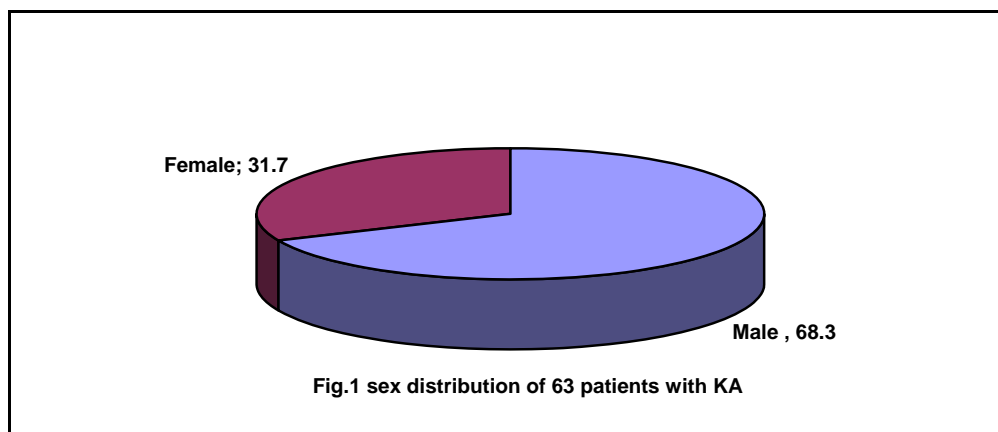
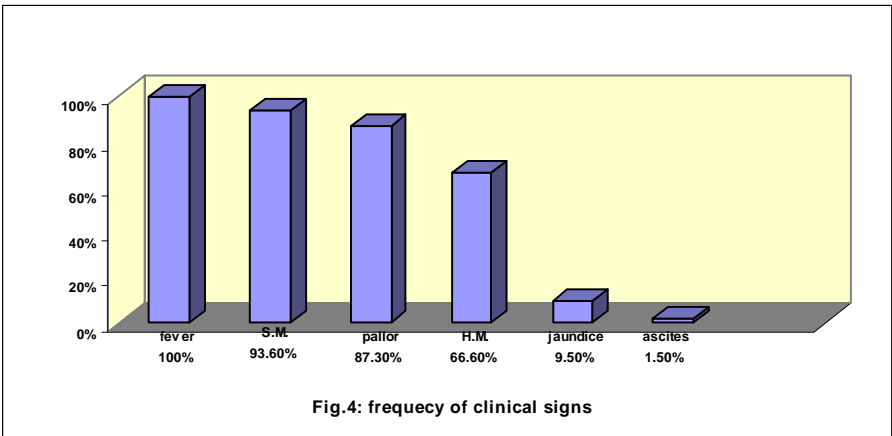
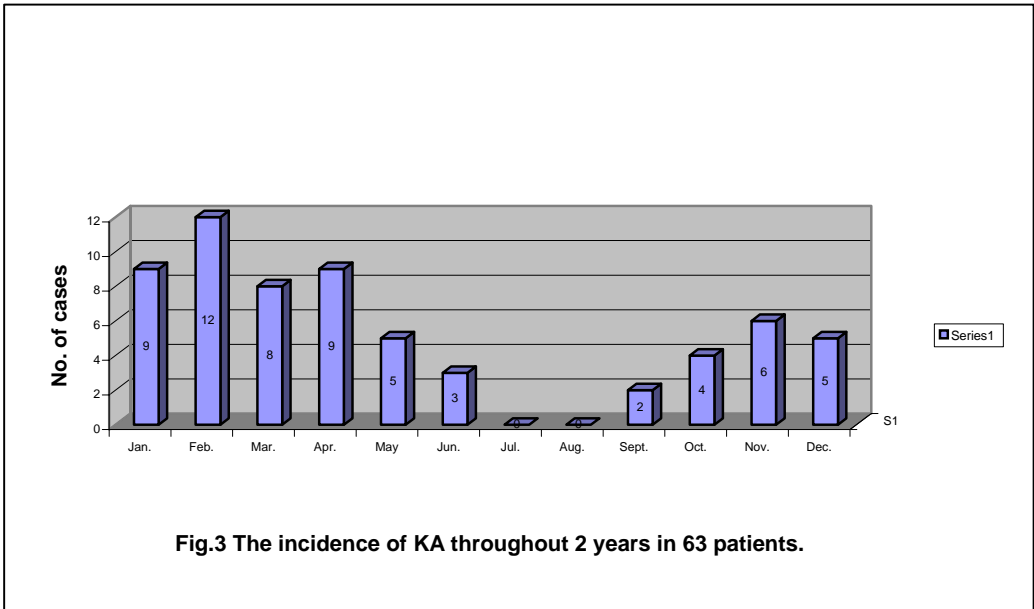
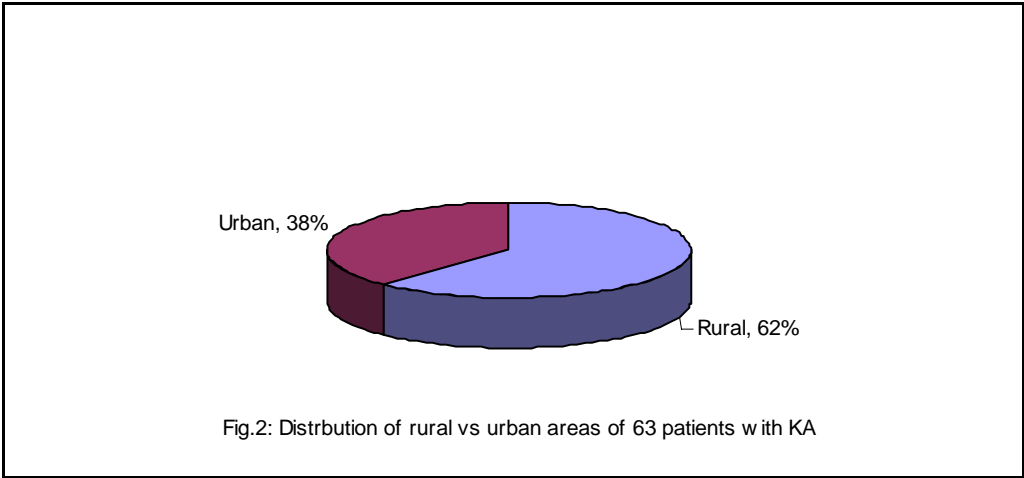


Table 2: Distribution of deficiency in blood elements

Blood elements	Number	Percentage
Anemia	55	87.3
Leucopenia	37	58.7
Thrombocytopenia	8	12.6
pancytopenia	8	12.6

No deaths were reported in the study.



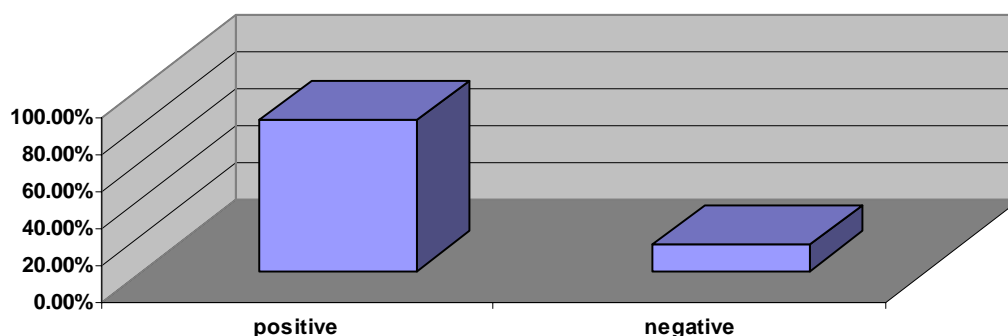


Fig.5 : Bone marrow study results of 49 patients with KA

Discussion

Visceral leishmaniasis is an endemic disease in Iraq; it is a major health problem. In spite of recent advances in diagnostic and therapeutic means, the disease is in a continuous increase^(10,11)

Incidence of the disease among male children was higher than among females (2.1:1), this is probably due to over care with boys, increased exposed area of body in boys compared to girls, or due to genetic factors.

The majority of infected children were in their early childhood (1-3 years), and the incidence of infection decreased with increasing age. Similarly, Sukkar and Nadim et al found the same trend of infection, this may be attributed to the fact that as age progresses the child gets more resistance in comparison to the younger age groups^(12, 13, 14)

The study also showed that V.L. is more frequent in rural areas than in urban ones. A similar finding was observed in a study done by Abdul-Majeed⁽¹⁵⁾. Favorable climatic conditions include temperature of 20-40°C and humidity of about 70 % (20). Despite this fact, a significant number of patients came from urban areas and even from city centers, this may be due to the tendency of people from rural origin to live in city centers or due to the increased

migrations from distant governorates, particularly from central and southern parts of Iraq, where V.L. is endemic in the last years.

It was also noticed that there is a definite seasonal variation as 76.1% of cases were seen during winter and spring. Our results are in agreement with a study involved central part of Iraq (including Baghdad, Diala, and Wasit)⁽¹⁶⁾. The cause may be due to the sand flies start to appear in April, raise gradually in density with their peak in September and disappear in December, which fits with the monthly distribution of cases if we take in consideration the incubation period which takes about 3-6 months in addition to 20-30 days before the patient seeks medical advice, followed by hospitalization and diagnosis⁽¹⁷⁾.

Anemia was present in 87.3% of cases. In about 30% of these, anemia was severe necessitating blood transfusion. Hypochromic -microcytic anemia was the commonest type (62%). WBC count of less than 4000 c/mm³ was observed in 58.7%, the rest of cases showed either normal WBC count or leukocytosis, therefore, this is most probably due to complications. Differential WBC counts showed relative lymphocytosis in the majority of cases (78%)⁽¹⁸⁾

Bone marrow aspirates were done in 77.7% of cases, positive results for LD bodies were 81.6%, while Zuhair Al-Musawi et al reveal 90.3% positivity⁽¹⁹⁾. This indicates that bone marrow examination is generally a good diagnostic procedure, even when bone marrow culture is not available. However, other available serological tests as IFAT or dip stick test are easy and rapid tests and can support the diagnosis.

Hepatitis had developed in 9.5% of cases, it was diagnosed by evidence of jaundice, hepatomegaly, and elevated liver enzymes. Pneumonia and gastroenteritis were reported in 6.3 and 4.7% of cases, respectively. These complications were noticed particularly in malnourished children and this could be due to immunological factors.

The number of relapses in this study was 3 cases (4.7%), compared to 7% in Yemen⁽⁹⁾. We believe that the reason behind this is the difficulties in the follow up of cases after their discharge from hospital.⁽²⁰⁾ No deaths were reported in the study, and in comparison to Missan⁽²¹⁾, where death rate was 4%. This could be due to smaller number of cases involved in this study or due to difficult follow up as was mentioned.

Conclusions and Recommendations

- 2- Visceral leishmaniasis is an endemic disease in both Al-Najaf and Kerbalaa' governorates.
- 3- The disease is more frequently encountered during winter and spring, and among males and toddler age group.
- 4- Though most of cases came from rural areas, an increasing number of patients were reported from urban regions. Hence physicians should be aware of the possibility of the disease even when the patient is from an urban area.

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