

## CLINICAL AND EPIDEMIOLOGICAL FEATURES OF KALA-AZAR IN THI-QAR GOVERNORATE

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### ABSTRACT

*A retrospective study was conducted on 376 patients with history of prolonged fever who were admitted in Al-Nassiriya Pediatric Hospital during the year 2002; their clinical features were highly suggestive of Kala-azar. Bone marrow examination was done for 200 cases and the results were positive in 168 cases (84%). Serological tests were not available to confirm cases diagnosed on clinical bases and those with bone marrow negative results, for that reason the last two groups had been excluded from the study. It was found that the majority of cases (94.64%) were below the age of 3 years, 51.8% were males and 48.2% were females. A high percentage of cases 85% were from rural areas and only 15% were from city center. The number of cases recorded during the year 2002 was much greater than that recorded during the years 1989, and 1990. The study had elucidated one of the important health problems among children in Thi-Qar governorate. The importance of preventive measures was stressed.*

### INTRODUCTION

Visceral leishmaniasis (VL) or Kala-azar is a severe and often fatal infection of human caused by protozoal parasite of leishmania species (L.donovani Complex, L. chagasi, L. infantum). Visceral leishmaniasis (VL) is transmitted from an animal reservoir to human by bite of a sand fly of the genus phlebotomus and it occurs in all continents except Australia<sup>[1]</sup>. Epidemics of visceral leishmaniasis were reported on the Indian subcontinents and in Sudan<sup>[2]</sup>. Visceral leishmaniasis is regarded as an endemic disease in Iraq since 1954<sup>[3]</sup>. It is regarded as one of the serious public health problems in Iraq especially because of limited control measures. According to the data of Kala-azar section in the endemic disease institute, Iraq, the number of cases reported during the years 1971-1984 was 12083, about 50% from Baghdad and about 90% from the central provinces of Iraq<sup>[4]</sup>. During the last few years, there were an increase in VL cases in Southern governorates of Iraq (*Maysan, Thi-Qar, Basrah, and Muthanna*). It was reported that 72.7% and 69.5% of recorded cases all over Iraq during the years 1995 and 1996 respectively, were from these governorates<sup>[5]</sup>. The aim of this study is to throw light on clinical features, diagnosis, epidemiological features, treatment and outcome of VL in children of Thi-Qar.

### PATIENTS AND METHODS

This is a retrospective study on visceral leishmaniasis cases who were admitted to Thi-Qar hospital from the first of January 2002 till the 31<sup>st</sup> of Decemeber 2002. The data were

obtained from hospital patient file system. The following information was obtained for each child: age, sex, place of residence, date of admission and discharge, clinical features on admission and outcome of cases enrolled in the study. The total number of cases was 376 patients. The diagnosis was established on basis of history, clinical examination and laboratory investigations. The investigations which were done included hemoglobin level (*expressed as gm / dl*), white blood cell count (total and differential counts, as cell / mmm<sup>3</sup>). These results were expressed as mean  $\pm$  SD). In addition, blood film for morphology; Widal test, rose Bengal test, liver function tests and total serum protein were done. Blood culture was done for selected cases. From the total number of admitted cases and diagnosed as visceral leishmaniasis, bone marrow examination was done for 200 cases only. The results were positive in 168 cases and confirmed to have visceral leishmaniasis (84%). The cases with negative bone marrow results were excluded from study. Serological tests were not available in Thi-Qar, for that reason cases were diagnosed on clinical basis and those with negative bone marrow results had been excluded from the study.

### RESULTS

In this study boys constituted 51.8% and girls about 48.2% of the total sample included, and the male: female ratio was 1.07:1. The majority of cases (94.64%) were below 3 years and 69.64% of total number of cases was below one

year as shown in (Table-1). The highest number of cases registered were from Al-Islah, Al-Dawayah and Al-Fohood sub-districts, these areas are mainly agricultural areas.

**Table 1. Distribution of the cases according to age.**

Age (years)	No. of cases	%
2 months- 1	117	69.64
2 - 3	42	25
4 - 5	7	4.16
6 - 7	1	0.59
8 - 10	1	0.59
<b>Total</b>	<b>168</b>	<b>100</b>

Out of 168 cases, 143(85%) of cases were from rural areas and 25(15%) from city center. The distribution of cases according to residence is presented in (Table-2). The highest number of cases registered were from Al-Islah, Al-Dawayah and Al-Fohood.

**Table 2. Distribution of cases according to residence.**

Residence	No. of cases	%
<b>Al-Nassiriya</b>		
City center	14	8.33
Said Dekhil	22	13.09
Al-Islah	30	17.85
Al-Sdenawayah	2	1.19
Al-Iskan	0	0
Al-Batha	2	1.19
<b>Suq Al-Sheyok</b>		
District center	10	5.95
Al-Ekekah	5	2.97
Al-Garma	4	2.38
Al-Tar	1	0.59
<b>Al-Shatrah</b>		
District center	6	3.57
Al-Garaf	5	2.97
Al-Dawayah	30	17.85
<b>Al-Rifaae</b>		
District center	1	0.59
Al-Nasser	1	0.59
<b>Al-Chebiash</b>		
District center	6	3.57
Al-Fohood	28	16.66
Al-Hammar	1	0.59
<b>Total</b>	<b>168</b>	<b>100</b>

The monthly distribution of cases was variable from one month to the other with about one third of cases registered during November and December, and another peak in July and August (Table-3).

**Table 3. Monthly distribution of confirmed cases of Kala-azar.**

Months	No. of cases	%
January	9	5.35
February	9	5.35
March	12	7.14
April	16	9.52
May	5	2.97
June	5	2.97
July	17	10.11
August	14	8.33
September	12	7.14
October	16	9.52
November	28	16.66
December	25	14.88
<b>Total</b>	<b>168</b>	<b>100</b>

Family history of Kala-azar was positive in 30 cases (18%). The duration of illness before hospitalization ranged between 2 weeks and more than 5 months, (Table-4).

**Table 4. Distribution of cases according to the duration of illness before hospitalization**

Duration	No. of cases	%
2 weeks - 2 months	45	26.78
2-5 months	100	59.52
> 5 months	23	13.69
<b>Total</b>	<b>168</b>	<b>100</b>

The main presenting symptom was fever which was seen in all cases (100%) and the main sign was splenomegaly which was detected in (92.2%) cases. Pneumonia and bloody diarrhea account for a significant number of presentations, (Table-5). A large number of patients presented with more than one sign and symptom.

**Table 5. Distribution of clinical symptoms and signs on admission of confirmed cases of Kala-azar.**

Signs and symptoms	No. of cases	%
Prolonged fever	168	100
Pallor	125	74.4
Splenomegaly	155	92.2
Hepatomegaly	120	71.4
Cough and dyspnea	41	24.4
Bloody diarrhea	21	12.5
Vomiting and diarrhea	6	3.5
Bleeding tendency	9	5.35
Jaundice	8	4.7
Generalized edema	6	3.5
Persistent vomiting	2	1.1
Recurrent Hematemesis	1	0.59
Repeated convulsions	1	0.59
Ascites	1	0.59

Note: A large number of patients presented with more than one sign and symptom.

The majority of patients had anemia (83.9%) and leukopenia (85.7%). Thrombocytopenia was recorded in (57.1%) of total number of cases. The laboratory findings and chest X-ray results are all presented in (Table-6). The average stay in hospital was 6-7 days, pentostam was the main antileishmanial drug

used in hospital (no other medication was available). All patients were given pentostam for 30 days.

In addition to pentosam therapy, blood transfusion was needed in 65(38.6%) of patients & antibiotics in 80(47.6%), (Table-7).

**Table 6. Distribution of cases according to laboratory findings and chest X - ray results.**

Lab findings and chest X-ray results	Mean ± SD	No. of cases	%
Positive bone marrow for L.D bodies		168	84
HB ( gm/dl )			
- Severe anemia	4.9 ± 0.62	15	8.9
- Mild to moderate anemia	8.01 ± 1.25	126	75
- Normal Hb value	10.68 ± 0.337	27	16
WBC Count ( / mm <sup>3</sup> )			
- Leukopenia with WBC count	2488.9 ± 692.1	144	85.7
- Normal WBC count	5725 ± 1742.66	20	11.9
- Mild leukocytosis with WBC count	11500 ± 790.57	4	2.3
Platelets ( / mm <sup>3</sup> )			
- Severe thrombocytopenia	38812.5 ± 5757.81	16	9.5
- Mild to moderate thrombocytopenia	92387.5 ± 25084.6	80	47.6
- Normal platelets count	198611.1 ± 43479.1	72	42.8
Total serum protein ( gm / dl )			
- Severe Hypoproteinemia	4.25 ± 0.25	10	6
Chest X-ray finding of pneumonia	-	41	24.4
General stool positive for E. Histolyticatrophozoite	-	21	12.5
Cerebrospinal fluid positive for bacterial meningitis	-	1	0.59
Abnormal liver function test with Hyperbilirubinemia	-	8	4.7

• The lab findings might be presented in combination in many patients.

(Table-7). The duration of response to pentostam was less than 7 days in 80% of cases and more than 7 days in 20 % of cases.

Relapses had never been recorded during one year of patient's follow up after treatment. Six patients died in hospital (3.5%); one case because of sepsis; 3 cases due to advanced liver disease and hepatic coma and 2 cases due to severe bleeding tendency.

**Table 7. Management of the admitted cases**

Types of treatment	No. of cases	%
Pentostam only	30	17.8
Need blood transfusion	65	38.6
Need antibiotics	80	47.6

Note: All patients received pentostam.

**DISCUSSION**

There was an increment in the number of reported cases of Kala-azar in Thi-Qar governorate in 1990s compared to the 1980s<sup>[6]</sup>. This could be attributed to many factors like:

- ♦ Agriculture development with subsequent increase in the populations of vector and reservoir.

- ♦ Lack of the educational programmes that could be offered to the population and medical staff especially in rural areas with poorly constructed houses.
- ♦ Destruction of health and vector control facilities during the Iraqi war in 1991<sup>[7]</sup>.
- ♦ Improvement in recording and registry of cases.

It was found that male: female ratio was 1.07:1; this may indicate that both males and females are equally exposed to the risk of transmission of the disease. These results are consistent with other studies done in Iraq<sup>[8]</sup>, and in other regions out side<sup>[9]</sup>. Although one study done in Pakistan<sup>[10]</sup>, showed that male: female ratio was 3:1. It was found that the majority of cases were below the age of 3 years; this suggests that small children are at higher risk probably because of low immunity. The results are similar to other studies carried out in Iraq<sup>[8,11]</sup>, and in other countries<sup>[12]</sup>. A large number of cases (85%) were from rural the disease is not limited to certain focus. The monthly distribution of cases showed that most cases registered during November and December

while in previous studies done in Iraq, the peak incidence of cases was during December and January<sup>[8]</sup>. There had been a prolonged period before hospitalization in majority of cases resulting in a significant complications, this could be due to poor education of the general population, failure on the side of general practitioners in early detection and diagnosis of Kala-azar. The average stay in hospital for admitted cases was 6-7 days, this seems short and reflecting the shortage in beds in our hospital and the policy of discharging patients once the temperature drops to normal and they improve clinically to be followed as an out patient every 10 days for one month duration and every 3 months for one year. It was found that 18% of patients had other member of their families who had had the disease previously and this was of help in reaching the diagnosis and it may confirm that the disease is highly endemic in Thi-Qar governorate. Most of the patients had anemia and leukopenia, while thrombocytopenia was recorded in 57% of cases; these findings reflect the delay in consultation. The main associated infections were pneumonia and amoebic dysentery seen in 24.4% and 12.5% of cases respectively; these complications are very likely in immune compromised patients presenting late for admission. Jaundice was seen in 8 cases (4.7%) and bleeding tendency in 5.3% of total number of cases; both are common findings in late presentation of the disease. Jaundice is not always a bad sign in Kala-azar since only 3 patients died out of 8 cases in our study. Pentostam was given for all cases in a dose of 10-20 mg/kg for 30 days, treatment regimen varies from one endemic area to another<sup>[13]</sup>. No clinical resistance to antimony therapy recorded in our study in contrast to other countries such as India, East Africa, or some parts of Latin America<sup>[11]</sup>. Antibiotics & blood transfusion were given as indicated; no relapses had been recorded in our study. Compared with figures of 7% in Yemen<sup>[14]</sup> and 5-36% for Kenya<sup>[15]</sup>, 6 patients died in hospital (3.5%) and this figure is also less than that of Baghdad study (7.8%)<sup>[16]</sup>. From this study it can be concluded that there was an increasing number of cases of Kala-azar over the past 10 years. The main age group affected was less than 3 years. The fatal outcome of the disease can be minimized by early supportive and specific

treatment. Thus we recommend that regular educational programmes should be carried out to the general population and medical staff about methods of prevention of this disease like periodic application of insecticides with residual action in order to control the vector sand fly, rodents control measures, stray dogs control measures and the use of protective clothes and use of insect repellents when exposure is unavoidable. In addition doctors should suspect kala-azar in young children with prolonged fever.

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