Some epidemiological aspects of visceral leishmaniasis (kala-azar) in children of Al dejail district.

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Abstract

Background:

Visceral leishmaniasis(Kala-azar) is a parasitic disease of human ,belonging to the genus Leishmania, a protozoa transmitted by the bite of a tiny 2 -3 millimeter-long insect vector, the phlebotomies sand fly.

Aldejail district of a high population density is one of highly endemic zone of the disease in Iraq

Aim:

To study some epidemiological aspects of visceral leishmaniasis in Aldejail district and monitoring the occurrence of cases of leishmaniasis through epidemiological surveillance

Patient and methods:

A 45 cases of Visceral eishmaniasis (VL) from Aldejail sector and territory had been studied regarding some epidemiological points of view including age ,sex ,seasonal distribution, residence (urban versus rural areas),socioeconomic status, presenting manifestation and its frequency ,severity of anemia at time of presentation and response to Sodium Stibogluconate (pentostam) as a traditional medication widely used in our country.

The diagnosis was based on clinical presentation of (VL) in addition to confirmatory serological tests (rK39 & IFAT for Kalazar) and /or bone marrow examination.

Results:

from a total 45 cases of VL randomly enrolled in this study , 25 cases (55.5 %) were 0-2 years age with a decreasing percentages with advanced age , there was a slight male predominance 24 males(53.4%) while 21were females (46.6%) .

Disease was more in rural than urban areas with a percentages of 35 cases(77.8%) and 10 (22.2%) respectively . They were presented in a sequence of fever in all patients (100%) as a major presenting complaint , also hepatosplenomegaly in (100 %) , anemia in 39 cases(86.7%) , cough in 12 cases (26.6%) , jaundice was seen in 12 children (22%) , odema and ascitis in 7 cases(15.5%) , bleeding tendency in 2 cases (4.4%) , while lymphadenopathy was not recoreded in any case of this study.

All cases were treated with Sodium stibogluconate (pentostam) in a dose of 15 mg/ kg for 21 days intramuscularly once daily , showed clinical improvement except for 2 cases who died on 2nd day of hospital admission due to very advanced disease ,massive bleeding with septic shock .

Sodium stibogluconate was highly effective in 43 cases (94.5%).

Haematological finding revealed anemia in 37 case (82.3%) while sever anemia (Hb level >7 gm/ dl) recorded in 22 children (40.5%).

Pancytopenia as a feture of the disease was seen in 32 cases (71.2%)

Conclusion:

Aldejail is highly endemic area for Kala-azar which was targeting mainly children in the first 2 years of life , mainly in winter and spring seasons .V.L must be suspected in any case with high prolonged fever especially if it was accompanied with hepatosplenomegaly.The disease was highly spread in rural areas where was the preferable inhibitant of sandfly

Sodium stibogluconate(pentostam) was the main effective treatment in our area.

Key word:- Leishmaniasis ,Visceral ,Kala azar , epidemiology.

Introduction

Visceral leishmaniasis (VL) also known as kala azar,(black fever) is a vector borne diprotozoan of leishmania donovani (1). Its a parasitic disease transmitted by the bite of some species of sandflies affects various age groups mainly children , depending on the species of Leishmania , geographic location, disease reservoir, and host immunocompetence. Sandflies breed in running water and are particularly prolific in areas near water and humid bush, for example at beaches, lakes, rivers and swamps.

Visceral leishmaniasis (VL) is the most severe form of Leishmaniasis affecting children (2). The disease is found distributed in 88 countries of the world, ninety percent of the overall cases of the world occur in five countries: India , which has the greatest burden of the disease , then Bangladesh, Brazil , Nepal and Sudan ,and soon Iraq with 4,000-5,000 annual case will be added as 6th country to the above list (3).Worldwide incidence is about 500000 cases/ year(4,5).

Kala- azar was reported for the first time in Iraq in 1916 (6) .In Iraq , the disease was known to be endemic since 1954 after reports from Baghdad (7) ,and Mosul (8) . It is more common in the central region of Iraq, more in rural than urban areas, more diagnosed in winter and spring, and more affecting children less than 3 years age (5).

The classic clinical features of high fever, marked splenomegaly ,hepatomegaly , and sever cachexia typically developed approximately 6 months after the onset of the illness, but a rapid clinical course over one month has been noted in up to 20% of patient in some series. At the terminal stages of kalazar the hepatomegaly is massive , there is gross wasting ,the pancytopenia is profound. Jaundice ,edema ,and ascitis may be present . Anemia may be sever enough to precipitate heart failure . Bleeding episodes especially epistaxis are frequent , The late stage of the illness is often complicated by secondary bacterial infections ,which frequently are a cause of death(9).Petechiae, echymoses and mild edema may appear, but jaundice and ascites are rare ,Jaundice and grossly deranged liver function tests were found to be bad prognostic signs.10). Appetite usually remains good(6).

Diagnosis of VL is based on clinical signs and symptoms and confirmation by serological tests and isolation of the Leishmania parasite. Different serological tests are used for diagnosis of VL including ELISA, direct agglutination test (DAT), indirect fluorescent antibody test (IFA) and molecular techniques PCR (11,12).Immunochromatographic dipstick test (rK39) is simple sensitive and rapid test widely used in Iraq .

The demonstration of parasites in relevant tissues such as spleen, bone marrow, lymph nodes, liver or the Buffy coat of peripheral blood is commonly used in the diagnosis of VL. Normally the diagnosis is based on finding amastigotes in monocytes or macrophages (seldom are they found free in the tissues except in HIV positive patients).

The sensitivity of this approach using bone marrow is about 60-85% and in spleen is more than 95%, making direct detection of parasites one of the most powerful techniques and the

spleen one of the more sensitive tissues to detect Leishmania (4) .
No vaccines or drugs to prevent infection are available. Preventive measures are aimed at reducing contact with sand flies , Protection against Mosquitoes, Ticks, & Other Arthropods; Preventive measures include minimizing outdoor activities, to the extent possible, especially from dusk to dawn, when sand flies generally are the most active; wearing protective clothing; applying insect repellent to exposed skin; using bed nets treated with a pyrethroid-containing insecticide; and spraying dwellings with residual-action insecticides (5) .

Patient and methods:

This retrospective study was performed to children with visceral leishmaniasis admitted to Ballad general hospital ,department of pediatrics from January 2013 to January 2015. Visceral leishmaniasis was defined as identification of the amastigote form of Leishmania in bone marrow smear, positive serological test (immunofluorescence antibody test), or both in a patient with manifestations compatible with visceral leishmaniasis i.e. fever, hepatosplenomegaly, anemia, leucopenia, and thrombocytopenia. Fever was defined as temperature >38°C. Anemia was defined as a hemoglobin value of <9.0 g/dL while in severe anemia the value is <7 g/dL. Reticular production index was was defined as low when its <2 (13).For each child admitted ,the following infomations were taken from either parents or child caretaker ,including age and sex ,residence (rural or urban) ,onst ,socioeconomic status ,presentig signs or symptoms. All children admitted to Balad hospital for evaluation and confirmation of diagnosis ,send for investigations(CBC ,rK39 ,IFAT for Kala azar ,bone morrow aspirate for LD bodies done for negative or weak positive serological tests.
All patients were categorized according to these upmentioned data which inturn tabulated ,diagrammatized and analysed through a descriptive statistics in a microsoft excel spreadshet release 2010.

Results

The study had included 45 case of visceral leishmaniasis confirmed by clinical evidence and laboratory investigations ,24 (53.4%) patients were boys, and 21 (46.6%) were girls (Table 1).The ages of patients ranged between 8 months - 8 years while no case recorded below 8 months or above 8 years ,Most of cases were less than 2 years of age 25 cases (55.5 %) mean age was (15 months) (Table 2).
Time of presentation distributed throughout the year with a majourity in 1st 3 months of the year 26 cases(57.6%) (winter and spring) (Table 3).
The most frequent sign and symptom were fever and splenomegaly recorded in all cases,while the least common was lymphadenopathy (Table 4).
35 cases(77.8%) were from rural areas versus 10 (22.2%) from urban residency (Table 5).
Regarding hematological results the most frequently encountered finding in this study was anemia reported in 37 case(82.3%) ,of them 22 patients (48.9%)were sever anemia (Hb < 7 g/dl)(Table 6), whereas pancytopenia was reported in 32 case (71.2 %)

Discussion

Aldejail to the south of Ballad district is one of important endemic focus of VL in Salahuddin governorate, about 60 km to the north of Baghdad.
The majority 25 (55.5%)of patients studied were below the age of 2 years, a finding that was similar to other studies(14,15), but was younger than what reported from Saudi Arabia(16) and Iranian studies(17).
In our study males affected more than females ,this was in accordance with results of other studies(18,19).,other researches showed both sexes equally affected proved by Sukkar et al (14,16) while our study showed a male predominance.
Our study showed obviously predominance of the disease in rural areas where the presence of sand fly and canines which play an important

role in disease transmission, similarly this was reported in other studies by Yousif .S,K Heqi et al in Basrah (15,19).

Majority of cases reported during January through April, this seasonal incidence was found corresponding to what recorded by other studies reported by W.H.O published in Saudi Medical journal (14,17,20) while one Iranian study evaluated 367 infants and children suffering from VL at hospitals affiliated to the Shiraz University of Medical Sciences in Fars Province, southwest Iran ,Seasonal variations were observed with more cases presenting in late winter, spring and fewer in summer(17).

Fever and hepatosplenomegaly reported in all cases in this study while a majority of them showed anemia ,abdominal distension ,anorexia ,and cough .these finding were similar to those of other studies done by Yousif S.K .Heqi in Iraq and another study done by Patil S.P., Rodriguez in Saudi Arabia(15,16) ,while the predominant clinical features in Iranian study were chronic fever, pallor, weight loss, abdominal distention and hepatosplenomegaly. Lymphadenopathy was less common not reported in our study unlike W.H.O study (17).

Regarding hematological changes ,presence of pancytopenia in 38 (84.8%) was discomman consistent with other studies (15,16,19) while its more than that recorded by Alramadi study done by Dr.Zaid Alani et al

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Table 1 Distribution of kala azar according to sex

sex	**Number of patients**	%

male	24	53.4
female	21	46.6
Total	45	100%

Table 2 Age distribution of Kala azar

Age in years	Number of patients	Percentage%
<1	9	20
1-2	16	35.5
2-3	8	17.8
3-4	4	8.9
4-5	3	6.7
5-6	2	4.4
6-7	2	4.4
7-8	1	2.2
Total	45	100%

Table 3 Seasonal distribution of V.L

Month of onset	Number of patients	Percentage%
January	13	28.9
February	9	20
March	4	8.9
April	2	4.4
May	0	0
June	1	2.2
July	0	0
August	1	2.2
September	1	2.2
October	0	0
November	4	8.9
December	10	22.2
Total	45	100%

Table 4 The presenting sign and symptom of kala azar patients

Clinical feutures	No. of patients	Percentage%
Fever	45	100
Hepatosplenomegaly	45	100
Pallor	39	86.7

Cough	12	26.6
Jaundice	10	22.2
Odema and ascitis	7	15.5
Bleeding tendency	2	4.4
Lymphadenopathy	0	0
Total	45	100

Table 5 Distribution of kala azar according to residency in Aldejail

residency	**Number of patients**	**%**
Rural areas	35	77.8
urban	10	22.2
Total	45	100%

Table 6 Hematological finding of kala azar cases

Hb level gm/dl	No. of cases	Percentage%
<7	22	48.9
7-10	15	33.4
>10	8	17.8
Total	45	100
Percentage .of cases showed pancytopenia	**84.8%**	

الخلاصة:
داء الليشمانيات الحشوي (كالا أزار) هو مرض يصيب الانسان وتنتمي إلى جنس الليشمانيا، وهو من البروتوزوا ينتقل عن طريق لدغة حشرة صغيرة طولها من 2 -3 ملليمتر(ناقلات الامراض) و الحشرة تسمى ذبابة الرمل الفصاد.
قضاء الدجيل منطقة ذات كثافة سكانية عالية وهي واحدة من المناطق الموبوءة بالحمى السوداء في العراق
الهدف:
دراسة بعض الجوانب الوبائية من داء الليشمانيات الحشوي في منطقة الدجيل ورصد نسب وتوزيع حالات الليشمانيا من خلال الدراسة و المراقبة الوبائية

المريض والطرق:
لقد تم دراسة 45 حالة من اللشمانيا الحشوية من قضاء الدجيل والمناطق المحيطة التابعة للقضاء ودراسة بعض الجوانب الوبائية من ناحية العمر، والجنس، والتوزيع الموسمي، والإقامة (الحضرية مقابل المناطق الريفية)، الوضع الاجتماعي والاقتصادي، والاعراض المرضية ونسب حدوثها، اضافة الى شدة فقر الدم في وقت دراسة المريض.وكذلك نسب الاستجابة لعقار ستيبوغلوكونات الصوديوم (pentostam) كدواء تقليدي يستخدم على نطاق واسع في بلدنا.
واستند التشخيص على الأعراض السريرية لمرض اللشمانيا الحشوية اضافة الى الاختبارات المصلية وتتضمن و IFATلداء كاالازار وrK39) و / أو فحص نخاع العظام.

النتائج:
من مجموع 45 حالة تمت دراستها عشوائيا في هذا البحث، كانت 25 حالة (55.5٪) باعمار تتروح بين 0-2 سنوات مع تدني في نسب الحدوث مع التقدم في السن، كان هناك تفوق طفيف للذكور 24 حالة من الذكور (53.4٪) في حين أن الاناث شكلت 21 حالة (46.6 ٪)
كان المرض أكثر في المناطق الريفية مقارنة بالمناطق الحضرية مع النسب المئوية من 35 حالة (77.8٪) و 10 (22.2٪) على التوالي.
الاعراض المرضية كانت بنسب متفاوته حيث ان جميع المرضى (100٪) كانو يعانون من الحمى كعرض رئيسي،وكذلك الحال في تضخم الكبد و الطحال حيث كانت موجوده في (100٪)، وفقر الدم في 39 حالة (86.7٪)، والسعال في 12 حالة (26.6٪)، وكان اليرقان موجودا في 12 طفلا (22٪) فيما كان استسقاء البطن والوذمه موجوده في 7 حالات (15.5٪)، والتهيؤ النزفي كان احد الاعراض في حالتين فقط (4.4٪)، في حين لم يتم تسجيل حالات تضخم الغدد اللمفاوية في اي من المرضى.
تم علاج جميع الحالات مع ستيبوغلوكونات الصوديوم (pentostam) في جرعة من 15 ملغ / كغ لمدة 21 يوما في العضل مرة واحدة يوميا، وأظهرت تحسنا سريريا كبيرا إلا في حالتين توفيتا في اليوم الثاني من دخول المستشفى بسبب كونها حالة متقدمة جدا مصحوبة بنزيف حاد، مع صدمة وعائية .
ستيبوغلوكونات الصوديوم كان عقارا فعالا في 43 حالة (94.5٪)
كشفت النتائج المخبرية لمكونات الدم وجود 37 حالة (82.3٪) يعانون من فقر الدم. بينما اظهرت 22 حالة فقط(40.5%) فقر دم شديد (مستوى الهيموغلوبين كان > 7 جم / دل).
كما ان قلة كريات الدم البيض الشاملة ظهرت بنسبة حدوث في 38 حالة (84.5٪)

الاستنتاج:
قضاء الدجيل منطقة موبوءة باللشمانيا الحشوية (كالا أزار) الذي يستهدف بشكل رئيسي الأطفال في السنتين الأولى من حياتهم، وخاصة في مواسم الشتاء والربيع. يجب أن يشتبه في أي حالة تعاني من الحمى العالية لفترة طويلة خاصة إذا رافق ذلك تضخما في الكبد والطحال .
انتشر المرض بشكل كبير في المناطق الريفية حيث كان موطنا مفضلا لذبابة الرمل.
كما كان عقار ستيبوغلوكونات الصوديوم علاجا رئيسا فعالا في منطقتنا.

الكلمات الرئيسية: ـ داء الليشمانيات الحشوي، كالا أزار، وعلم الأوبئة