Clinical and epidemiological aspects of visceral leishmaniasis in Al Gadarif teaching hospital November2018

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Abstract

Background

Visceral leishmaniasis (VL) or kala-azar is a systematic parasitic infection caused by two leishmanial species, L. donovani or L. infantum/ chagasi. The infection is transmitted by the bite of infected sand fly Phlebotomus argentipes. L. infantum/ chagasi infects mostly children and immunosupressed individuals(1).

Methods

This was a cross sectional, hospital-based study conducted from 20th of October to 25th of December 2018 to describe the clinical and epidemiological features of visceral leishmaniasis among patients admitted at AlGadarif teaching hospital.

Results:

100 patients were included in the study. Age ranged from 1 year to 79 years. 40% were children , 38 % adult male , 27% adult females and 20% came from Om bielel . 57% were served with well water . Average number of latrines in 53%are zero . 62% illiterate . with average monthly income 1.500SDG . 42% use ITNs with 76% vary in sleeping habit . Clinical presentation included splenomegaly (77%), fever (96%) . Regarding children pallor in 67% and in adults splenomegaly in 93% .60% misdiagnosed and mistreated as Malaria and Typhoid. The mean values for laboratory variables were: hemoglobin 59%, leukocyte count 2500/mm³, and platelet count 135000 mm³.with lowest platelets record about 15000 Mainly the diagnosis through Serology in 47%The first line treatment used in 58% of the cases was combination of SSG and Parmomycin . Ambisome was used in 41%.

Conclusions

While there is an advance in prevention and management of visceral leishmaniasis our results indicate that VL is still a public health problem with its severe presentation among patients in eastern Sudan. High clinical suspicion is very important and introducing the preventive measures (prevention of transmission through vector control and community awareness) are needed to reduce the spread of the infection.

Introduction

Visceral leishmaniasis (VL), also called kala-azar, is a parasitic disease caused by members of the Leishmania donovani complex (L. donovani and L. infantum) and transmitted by the female phlebotomine sand flies of the genera Phlebotomus (Old World) and Lutzomyia (New World). It mainly affects areas in South Asia (India, Bangladesh, and Nepal) and Eastern Africa, where Sudan is the most affected country, followed by Ethiopia, Kenya, Somalia and Uganda. In Sudan, the causative agent is L. donovani, transmitted by the Ph. orientalis.

Gedaref State is the main endemic area of VL in Sudan. Passive detection figures from 1996 to 1999 have shown a mean yearly incidence between 6.6 and 8.4 VL cases per 1000 persons, with a large variation between villages (from 0 to 60 cases per 1000 persons per year) [2 , 3]. Villages with high incidence are clustered along two rivers (Atbarah and Rahad), in areas of low altitude and high rainfall. Leishmanin skin testing, a marker of past exposure to the disease, has been shown to be positive in 21.6% of the population of the Atbarah area [4]. Many individuals infected by L. donovani have subclinical infection, while others develop clinical VL, a devastating illness that is usually fatal when left untreated. In Sudan, clinical signs develop gradually 2 weeks to 1 year after infection (in most cases after 2 to 4 months). Typical features are persistent fever, splenomegaly, weight loss and lymphadenopathies [5]. Post-kalaazar dermal leishmaniasis (PKDL) is a skin rash appearing after VL treatment, affecting up to 50% of treated cases in Sudan [6].

PKDL usually appears within 6 months after apparent cure and can last for months or years. Leishmania parasites can be found in smears of the skin lesions, and PKDL lesions are suspected to be an important parasite reservoir for human-to-human transmission.

In Sudan, most lesions heal spontaneously. If not, PKDL treatment is challenging [7]. Some vector-control strategies such as indoor residual spraying have been shown to reduce the density of sand fly vectors in the Indian subcontinent [8], where the vector Ph. argentipes exhibits a behaviour different from the Sudanese vector. In Africa, bednet use has been shown to potentially reduce VL incidence [9]. Also, strategies to promote early detection and treatment have been shown to reduce case-fatality rates of VL in Brazil, where zoonotic .

VL is caused by L. infantum (syn. L. chagasi) [10]. Furthermore, early detection and treatment of anthroponotic VL patients is also believed to lower transmission through the reduction of the human reservoir [11]. This is supported by one pilot study that achieved good results using a combination of active detection, treatment and indoor residual spraying after a local outbreak of VL in one village located in the Bihar State of India [12]. However, although recommended, this strategy has never been formally evaluated in L. donovani endemic areas and is rarely implemented.

Since December 2009, Me´decins Sans Frontie`res (MSF) has been diagnosing and treating patients presenting at Tabarak Allah Hospital, located in Al-Gureisha locality of the the Atbarah focus.

MSF intended to conduct a cluster-randomized trial to evaluate the impact of an active VL and PKDL case detection strategy on the incidence of clinical VL. For the appropriate planning of this trial, a baseline survey was conducted in eligible villages around Tabarak Allah Hospital. The main objective of this survey was to estimate the incidence rate of VL over a one-year period at the village level. Additionally, we also aimed at retrospectively estimating the crude and VL-specific mortality rates, the proportion of VL cases missed by the passive case detection system in place, the proportion of the population treated for VL in the past, and the proportion of PKDL among patients previously treated for VL.

Since 1900s, visceral leishmaniasis (VL) has been among the most important health problems in Sudan, particularly in the endemic areas such as eastern and central regions [13]. Thus, the current study was conducted to investigate the Clinical and epidemiological aspects of visceral leishmaniasis in Al Gadarif teaching hospital Gadarif, eastern Sudan and the results of this study is expected to provide the health planners with fundamental data necessary for the implementation of preventive measures in this area of the country through early detection and proper intervention .

Methods

Study design and data collection

This was a cross sectional, hospital-based study conducted from 20th of October to 25th of December 2018 to describe the clinical and

epidemiological features of visceral leishmaniasis among patients admitted at Al- Gadarif teaching hospital.

The cases included all patients from 1 with year to 79 years old with clinical symptoms of VL and in whom the diagnosis of VL was confirmed by laboratory test. A structured questionnaire was used to gather the socio-demographic characteristics (age, residence, the education and occupation of both parents), duration of the illness, reason of clinical presentation (fever, fatigue, weakness, loss of appetite and weight loss), clinical sign (pallor, jaundice, epistaxis or sign of bleeding tendency, enlarged lymph nodes, spleen and liver .

Proper systemic examination was performed to each patient by a paediatrician and physicians including cardiovascular system, respiratory system, abdomen, musculoskeletal system and central nervous system. Basic tests were performed for every patient on admission and repeated when clinically indicated. These included complete blood count, urine analysis, blood film for malaria, stool analysis and abdominal ultrasound. We looked for the parasite in bone marrow aspirate and other tissues using Giemsa-stain.

The diagnosis was confirmed by the visualization of the amastigote form of the parasite by microscopic examination of aspirates from lymph nodes or bone marrow. Specific anti-leishmanial drugs (sodium stibogluconate and parmomycin were first line while in cases with severe side effects liposomal ambisome was the second option) and the aggressive management of any concomitant bacterial or parasitic infections, anaemia, hypovolemia (decreased blood volume) and malnutrition was the treatment for the patients. All patients were under multidisciplinary care and were closely followed during their hospital stay and then every month in the refer clinic.

Results

During the study period there were 100 identified Patients with VL. All the studied patients were residents of Gadarif State, their age ranged between 0 and 80 year, and the vast majority of the infected children were of rural residence (). The age distribution of the studied cases was as follows: Adult males constituted 39 (38%) cases; Adult females 21 (21%) cases; children 40 (40%) cases.

The most common clinical presentations were fever (96%), splenomegaly (77%), pallor (62%), lymphadenopathy (60%) weight loss (54%), Hepatomegaly (45%) , loss of appetite (36%) , vomiting (25%) cough (20%), jaundice (15%). Epistaxis (11%) and Diarrhea (8%) . Anaemia (haemoglobin level < 12 g/dl) was detected in (82%) patients

with mean value of 59% and pallor is the most common sign of children (67%) in 27 patients . leukopenia in (62 %) and thrombocytopenia in (61%) with lowest platelets record about 15000 .Interestingly 60% were initially misdiagnosed and mistreated as cases of febrile illness such as malaria and other. Most of the patients (58%) responded to sodium stibogluconate and parmomycin .

Main symptoms and clinical findings of patients admitted to Al-Gadarif with diagnosis of leishmaniasis from **from 20th of October to 25th of December 2018**

Symptoms	Percentage	Symptoms	percentage
Fever	96%	Epistaxis	11%
Weight loss	54%	Headache	11%
Loss of appetite	36%	Fatigability	9%
Sweating	33%	Diarrhea	8%
Rigor	26%	Convulsion	5%
Vomiting	25%	SOB	4%
Abdominal pain	25%	Heamatomasis	3%
Abd distention	21%	Back pain	2%
cough	20%		

signs	Percentage	Signs	Percentage
splenomegaly	77%	jaundice	13%
Pallor	62%	Epigastric tenderness	3%
Lymphadenopathy	60%	Conjunctival hemorrhage	1%
hepatomegaly	45%		

Discussion

Severe VL epidemics are reported in poor communities and poor people in developing and middle income countries such as Nepal and India [14]. Anaemia is a common public health problem in eastern Sudan where 36.2% of the adults had anaemia [15]; the common causes of anaemia in this area include: chronic illness, followed by nutritional and repeated malaria infection [16]. Severe VL epidemics have been reported in the past: in Southern Sudan, in a context of civil war and at that time VL killed an estimated 100,000 people out of a population of 280,000 between 1984 and 1994 [17]. Gadarif state is bordering two neighbouring countries (Ethiopia and Eretria) and characterized by poverty with nomads and refugees and this might explain

the prevalence of the infection in this area of Sudan. Interestingly 60% of the patients were initially misdiagnosed and mistreated as cases of febrile illness such as malaria. This is attributed to the lack of proper diagnostic facilities and low priority of leishmaniasis in our setting. Furthermore this may be another problem added to the probability of relapses due to loss of follow up Thus health care providers generally need high clinical suspicion to diagnose VL. The clinical presentation of VL in children in the majority of the cases is more severe than in adults, commonly with severe anaemia. In our cases, fever and pallor, weight loss and lymphadenopathy were the most common clinical presentations. The clinical presentation of VL is similar in the various endemic areas. However lymphadenopathy is rarely found in Indian VL patients but it is frequent in Sudanese VL patients [18]. In a study conducted by Rai et al., majority of the patients (98%) presented with fever followed by abdominal distension (47%), pallor (44%), weight loss (43%), diarrhoea (17%), vomiting (15%) and hepatosplenomegaly (83%) [19]. Again and in consistent with our results, weight loss, hepatosplenomegaly, lymphadenopathy and prolonged fever were the most common clinical signs reported by Walyeldin and his colleagues in Omdurman Emergency Hospital for Children (OEHC), Sudan, 2006–2008 . Male predominance in our study could be easily justified by the fact that adult male usually work in the farms and thus there is greater chance to be exposed to the sand fly. In our study there was significant correlation between VL and rural residence.

Also after knowing the most sector of the community that affected we should Recognising the very low level of education in the population, the main message of all health education campaigns should be simple both to convey and to understand. Health education should mainly be person-toperson, as most people are illiterate, and only one-third of the households own a radio. Because women play a central role in the health of the household members and the implementation of disease-preventive behavioural change (McMichael 2000), they should be specifically targeted in awareness and health education activities. In addition, health education campaigns should be carefully adapted to the special beliefs, behaviours and traditions within the different (ethnic) groups living in areas that are endemic for VL.

Conclusions

While there is an advance in prevention and management of visceral leishmaniasis our results indicate that VL is still a public health problem with its severe presentation among patients in eastern Sudan. High clinical suspicion and introducing the preventive measures (prevention of transmission through vector control and community awareness) are needed to reduce the spread of the infection . Early detection is the key .

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