

Research Article

Seroprevalence of HIV Infection among Visceral Leishmaniasis Patients in Gadarif, Eastern Sudan

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Abstract

Background: Worldwide leishmania/HIV coinfection is an emergent problem.

Methods: Aiming to investigate the seroprevalence of HIV among Visceral Leishmaniasis (VL) patients all notified cases of VL that were reported in Gadarif Teaching Hospital during January 2015– through December 2015 were reviewed and analyzed.

Results: During the study period there were 659 reported VL patients. Although 198 (30%) of these 659 VL patients agreed to do HIV test initially, only 80 (12.1%) had done the test and eight out of the 80 tested VL patients had HIV co-infection yielding an incidence rate of 10%. Of note, Leishmania-HIV co-infected patients were more frequently presented with weight loss (100% versus 26.3%, $P=0.010$) compared with non HIV-infected patients. Again higher number of deaths was observed among the Leishmania-HIV co-infected patients (37.5% versus 0%, $P=0.041$).

Conclusions: There is high Seroprevalance of HIV among VL patients in Gadarif, eastern Sudan; it is 3 times higher than what had been reported in 2003 in the same area of Sudan. There is unremarkable clinical difference between the VL-HIV positive and negative patients however higher number of death was observed among HIV-VL co infected patients.

Keywords: Leishmania; HIV; Infection; Mortality; Sudan

Background

Visceral Leishmaniasis is endemic disease in seven states and 17 localities in Sudan [1]. In the period 2002–2011, a total of 29700 cases were reported with 3.7% case-fatality rate [1,2]. Gadarif State is highly endemic area of VL in Sudan. During 14 year duration (2002-2015), a total of 51773 patients were registered at Gadarif State with clinical and laboratory evidence proven VL [3]. Worldwide leishmania/HIV coinfection is an emergent problem [4]. In most African countries the prevalence of HIV increased dramatically from the mid- 1980s to the 1990s [4]. Since 2000, however, a decline has been observed in the incidence of HIV infections, which can be explained by a variety of factors, most notably preventive measures and access to ART [5]. The provision of Voluntary Counseling and Testing (VCT) is very important part of any national HIV preventing programme. It is well recognized that peoples living with HIV who are aware of their infection are less

likely to transmit HIV to others [6]. Several authors [6,7] have noted that VCT is a key element to identifying HIV infected persons who could benefit from therapeutic interventions [7]. Thus the current study designed and directed to investigate the seroprevalence of HIV among VL patients in Gadarif, eastern Sudan.

Methods

Study area

Gadarif, eastern Sudan, is populated by 1,727,401 residents, covers 75.000 Km² and lies between latitude 14-16 north and 33-36 east longitude. It is nearly 450 kilometer from Khartoum, capital of Sudan with a prominent diversity in culture, religion, language and ethnicity. Eastern Sudan is bordered by two African countries having a high prevalence of HIV infection [8].

Patients Management and Approach

According to the WHO: “a case of visceral leishmaniasis was a person showing clinical signs (mainly prolonged irregular fever,

splenomegaly and weight loss) and the confirmation was mainly based on the bone marrow aspirate, either by direct microscopy visualization or PCR detection [9]. For all identified leishmaniasis patients the WHO guidelines were applied, this guideline is based on the internationally agreed strategies for the disease control [10]. The regime which is recommended at Sudan consists of intra-venous sodium stibogluconate 20 mg/kg plus intra-muscular paromomycin sulphate 15 mg/kg for 17 days in HIV negative patients while in HIV co-infected patients AmBisome (Liposomal amphotericin B 3 mg/kg) infusion for 10 days was recommended.

Study Design and Data Collection

All notified cases of Visceral Leishmaniasis (VL) that were reported in Gadarif Teaching Hospital during the period of January 2015 - through December 2015 were reviewed to investigate the seroprevalence of HIV, clinical profile and outcome. Data reviewed were sociodemographic characteristics, clinical findings, HIV co-infection and outcome. HIV statuses was defined as positive or negative and at the time of their two month follow up, all VL patients were offered a free, voluntary HIV screening after verbal justification and written consent. HIV screening was conducted by qualified and trained staff and initial testing was performed using rapid assay, reactive specimen was retested by Enzyme-Linked ImmunoSorbent Assay (ELISA). The outcome registered as complete recovery, relapse, lost during follow up and death and the death is registered without further explanation (disease related or not disease related). Clinical cure, assessed at 2 and 6 months after the end of treatment, was defined as meeting all the following criteria: (a) an absence of fever, (b) no hepatosplenomegaly and, (c) no hematological abnormalities. Patients who did not meet all of the above criteria were classified as cases with poor outcome. According to our local routine, a parasitological test of cure was not performed. Nonetheless, the collection of a new bone marrow aspirate was indicated to confirm VL relapse when the emergence or worsening of any VL signs or symptoms (fever, hepatosplenomegaly and cytopenia) was observed.

Data analysis

Data were entered into a computer database and SPSS software (SPSS Inc., Chicago, IL, USA, version 16.0) and double checked before analysis. Means and proportions for the socio-demographic characteristics and other variables were compared between the groups of the study using student and χ^2 test, respectively and $P < 0.05$ was considered significant.

Ethical consideration

The study received ethical clearance from the Health Research Board at Gadarif University, Sudan.

Results

During the study period there were 659 reported VL patients.

Although 198 (30%) of these 659 VL patients agreed to do HIV test initially, only 80 (12.1%) had done the test and eight out of the 80 tested VL patients had HIV co-infection yielding an incidence rate of 10%. The age of the enrolled 80 VL patients ranged between 18-62 year with mean (SD) 32.1 (7.2), the majorities of these patients were illiterate 63 (78.5%), male 58(72.5%) married 41 (51%) and of rural residence 68 (85%). More than one half subjects were farmers 42 (52.5%). The most common clinical presentations were fever 75 (93.8), pallor 74 (92.5%), splenomegaly 56 (70%), hepatomegaly 43 (53.8%), lymphadenopathy 41 (51.3%), vomiting (32, 68%), weight loss (27, 33.7%) and diarrhea 7 (8.8%). Out of the 8 VL-HIV co-infected cases 5 (62.5%) completely recovered and 3 (37.5%) died. The reported cause of death included hepatic failure (1 patient), acute renal failure (1 patient) and unknown cause (1 patient). Of note, Leishmania-HIV co-infected patients were more frequently presented with weight loss (100% versus 26.3%, $P=0.010$) compared with non HIV-infected patients, table 1. Again higher number of deaths was observed among the Leishmania-HIV co-infected patients (37.5% versus 0%, $P=0.041$), Table 1.

Variable	HIV +ve case (N=8)	HIV -ve case (N=72)	P
Age, years	31.4 (8.9)	32.2 (8.8)	0.912
Male patients	6 (75%)	52 (72.2%)	0.115
Urban residence	7 (87.5%)	61 (84.7%)	0.314
Urban residence	7 (87.5%)	61 (84.7%)	0.314
Illiteracy	6 (75%)	57 (79.1%)	0.571
Illiteracy	6 (75%)	57 (79.1%)	0.571
Farmer patients	4 (50%)	38 (52.7%)	0.511
Data was shown as mean (SD) and number (%) as applicable			

Table 1: Comparison in socio-demographic data between HIV -ve and HIV +ve VL patients in Gadarif hospital, eastern Sudan.

Discussion

This study represents the HIV-prevalence data among VL patients in high burden setting of leishmaniasis in Sudan [3] and it showed high seroprevalence of HIV among VL. This finding calls for an urgent decision from the Ministry of Health to adopt the screening programme among VL patients. Yet, it might be difficult to expand such programme among VL patients because Sudanese people had poor uptake for HIV testing and counseling [11]. The prevalence of HIV among VL patients has remained proportionally very high in many African countries [12]. The northwest districts of Ethiopia along the Sudanese border report the highest burden of HIV and VL coinfection rates, with HIV prevalence rates of 20%–40% among VL patients [13]. A hospital-based study conducted in Khartoum, capital city of Sudan reported a coinfection rate of 9.4% in 2002 and report from Gadarif, eastern Sudan (the study area), in 2003 found HIV coinfection in 3.6% of VL cases [14]. The increase in HIV coinfection among VL patients from 2003 to 2015 in Gadarif State could be due to the massive population movement in the study area. In this area of cash-crop farming, there is a high labour demand, and many people highlanders from urban

and semi-urban areas seasonally move in and out of the region. Both VL and HIV infections affect the immune system so it is not surprising to find unremarkable difference in the clinical presentation between the two groups of investigated patients. A study in Ethiopia indicated that post-kala-azar dermal leishmaniasis PKDL was more frequent among HIV patients, with an incidence of moderate–severe PKDL of 27.3% in HIV patients and 13.3% among non-HIV patients by the sixth month after VL treatment [15]. However; most PKDL case reports from Sudan were in HIV-negative patients [16]. In line with our results other studies in the Mediterranean region revealed no difference in the clinical manifestations of leishmaniasis in HIV-positive and HIV-negative patients, although atypical symptoms and signs may occur [17].

Variable	HIV+ve cases (N=8)	HIV -ve cases (N=72)	P
Fever	7 (87.5%)	68 (94.4%)	0.11
Pallor	7(87.5%)	67 (93%)	0.236
Splenomegaly	5 (62.5%)	51 (70.8%)	0.122
Splenomegaly	5 (62.5%)	51 (70.8%)	0.122
Hepatomegaly	4 (50%)	39 (54.1%)	0.606
Hepatomegaly	4 (50%)	39 (54.1%)	0.606
Lymphadenopathy	4 (50%)	37 (51.3%)	0.111
Lymphadenopathy	4 (50%)	37 (51.3%)	0.111
Vomiting	3 (37.5%)	29 (40.2%)	0.123
Weight loss	8 (100%)	19 (26.3%)	0.01
Diarrhea	1 (12.5%)	6 (8.3%)	0.317
Death	3 (37.5%)	0 (0%)	0.041
Data was shown as number (%) as applicable			

Table 2: Comparison in clinical presentation and outcome between HIV –ve and HIV +ve VL patients in Gadarif hospital, eastern Sudan.

Our study showed higher number of deaths among VL-HIV co-infected patients. Early initiation of ART had a clear impact on reducing mortality and relapse, and should therefore be considered a key intervention in the management of these patients. Burza et al. and others found that when ART is initiated immediately following VL treatment it will reduce the risk of mortality in co-infected patients [18, 14].

One of the major limitations of this study the nutritional and socioeconomic status was not assessed, because of logistical constraints. Our study was a hospital-based one; which might not reflect what was at the community level thus more research is needed.

Conclusions

In conclusion there is high seroprevalance of HIV among VL patients in Gadarif, eastern Sudan, it is 3 times higher than what had been reported in 2003 in the same area of Sudan. There is un-

remarkable clinical difference between the VL-HIV positive and negative patients however higher number of death was observed among HIV-VL co infected patients.

Competing interest

We declare that we have no conflict of interest.

Author’s contributions

The authors alone are responsible for the content and writing of the paper.

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