Clinical manifestations, laboratory findings and outcomes of patients admitted with Visceral Leishmaniasis in two hospitals in Omdurman, Khartoum State, 2019-20

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Abstract:

Background: Visceral leishmanaisis (VL) is one of the neglected tropical diseases. worldwide, the annual incidence and prevalence of kala-azar cases are increasing. With estimated 20 thousand to 40 thousands deaths every year. Children constituted 7% to 10% of cases in endemic regions. In Sudan, VL is endemic in 7 states and 17 localities. This study presents the clinical manifestations, laboratory findings and outcomes of patients admitted with VL in two hospitals in Omdurman, Khartoum State, 2019-20.

Methods: This is a descriptive cross-sectional hospital-based study where 70 VL cases were enrolled from Mohammed Alamin Hamid Teaching Hospital and Tropical Diseases Hospital. Data was extracted from records using a standardize form and was entered and analyzed using SPSS version 25.0. Results were displayed in frequency tables with percentage.

Results: Thirty-seven percent (37.1%) of the study participants were in age group of less than five years old and 71.4% were under 10 years. Males represents 55.7% of cases. Fever for more than 2 weeks was

reported by 78.6%. While 35.7% reported as having concomitant bacterial infection, 41.4% of the study participants were malnourished. Other clinical findings include bleeding tendency (14.3%), dyspnea (5.7%), jaundice (5.7%). The test for HIV infection, hepatitis B virus, hepatitis C virus and for TB was not done in the majority of cases. The majority (88.6%) of cases had a haemoglobin less than 10 grams/dl and 34.3% had total TWBCs of less than 2500 and 25.7% had platelets count of less than 50000 with 27.8% of them had bleeding tendency. Seventy-three percent (72.9%) of the study participants were on combination therapy and the majority (88.6%) of the study participants were discharged in a good condition with a case fatality rate of 8.6 %.

Conclusions: The findings in this study was similar to other published work with slight change in some parameters. Early detection of VL among pediatrics patients in Sudan, can reduce the burden of the disease and consequently reduces child morbidity and mortality. Therefore, there is a need for raising awareness and for further researches

Keywords: Visceral leishmaniasis, Kalzar, Sudan

Introduction:

Visceral leishmaniasis (VL) or kala-azar is a 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 immune-suppressed individuals, whereas L. donovani infects all age groups [(1).]

VL is endemic in more than 60 countries worldwide including Southern Europe, North Africa, the Middle East, Central and South America and the Indian subcontinent placing a huge burden on society in terms of morbidity, mortality, and economic burden [(2).] Worldwide, more than 90% of VL cases occur in six countries: Bangladesh, Brazil, Ethiopia, India, South Sudan, and Sudan. In Sudan, VL is endemic in seven states and 17 localities, and all clinical forms exist (VL, post-Kalazar Dermal Leishmaniasis (PKDL), Cutaneous L, Mucocutaneous L). During the period 2002–2011, a total of 29,700 cases were reported, with a case fatality rate of 3.7%. Over the 14-year study period (2002– 2015), a total of 51,773 patients were registered in Gadarif State with clinical and

laboratory evidence of proven VL. The highest fatality rate was observed in 2002 (4.8%) and it had declined in 2014 (1.1%) and 2015 (1. 7%) (Manual for the diagnosis and treatment of leishmaniasis).

The clinical manifestations of childhood VL are more or less same as in the adults. Anemia, weight loss, hepatosplenomegaly, lymphadenopathy, prolonged fever, anorexia, loss of appetite, and hair changes are the most common clinical presentation among the children [(2)]. Bacterial super-infection such as pneumonia, septicemia, otitis media, urinary tract infections and skin infections are the major complications leading to death in children with VL[(4).] Other complications among children include parasitic infestations of the alimentary tract and post-kala-azar dermal leishmaniasis (PKDL) [(1).] The occurrence of death from VL among children is associated with several factors, including young age and the presence of comorbidities such as infections, malnutrition, and AIDS [(4).] Platelets counts are usually affected after long duration of illness. Studies reported in their study that the average duration of illness was significantly longer in thrombocytopenic patients as compared to non-thrombocytopenics. Mean platelet count has been found to be 109 ± 82.3 × 109/l and an incidence of 55–65% has been recorded in various studies [(5)]. Studies stated that thrombocytopenia of variable degree was found in 92% patients; in 44% of patients, platelets were less than 60,000 mm3. The platelet adhesive index was less than 30% in 70% of patients with VL (normal 31–60%). They found that there was a fair degree of correlation between platelet adhesiveness and platelet factor III availability in these patients: 50% of patients with poor platelet adhesiveness showed reduced platelet factor III availability [(5)]. A number of bleeding manifestations were reported to be occurred among children with visceral leishmaniasis such as epistaxis, and rarely hematemesis. Prevalence of epistaxis in visceral leishmaniasis was around 51% in Sudan and the Mediterranean littoral area [(6)] and 47–88% in the study of Zijlstra and EL-Hassan [(7).] Studies reported also that it was only 23.8%, it may be due to the different zoographical locations and hospital-based study. They reported also that there was no specific pattern of bleeding as most of cases had diffuse mucosal bleed [(8)]. The pathogenesis of bleeding (such as epistaxis) occurring in early phase of disease is not understood, but that occurring late in the disease is probably due to a combination of deficient clotting factor and thrombocytopenia [(8).]

The gold standard for diagnosis is visualization of the amastigotes in splenic aspirate or bone marrow aspirate but serological testing is much more frequently used in areas where leishmaniasis is endemic. Sodium antimony gluconate (stibogluconate), Pentamidine isothionate, though effective is relatively toxic. Amphotericin B is the most effective drug for the treatment of VL. Miltefosine is the first-ever oral drug, is

highly effective [2,8]. Post kala-azar dermal leishmaniasis (PKDL) in children poses a therapeutic challenge. In the absence of an ideal vaccine for VL, control measures would essentially include prevention of transmission through vector control and community. [8]

Although the disease is prevalent in Sudan, the majority of the studies were carried out in Gaderif State with details about sociodemographic and clinical characteristics of patients. Cases admitted to Khartoum hospitals were not well studied and their sociodemographic and clinical characteristics were not well documented. This study aims to identify individual, clinical and laboratory factors associate with VL among cases admitted to two hospitals in Khartoum State, Sudan.

This study may provide an updated knowledge regarding the fundamental data necessary for interventions and the implementation of a strategic plan to improve early detection of different clinical and laboratory presentations of VL that may lead to death and may highlight the need for concentration in certain socio-demographic groups.

Materials and methods:

Study type and setting: this descriptive cross-sectional hospitals-based study was conducted out in Mohamed Elamin Hamid Paediatric Teaching Hospital and Tropical Diseases Hospital during 2019-2020.

Study population and sampling: All patients admitted with the diagnosis of VL during the identified period were subject to study. Patients aged 1-18 years who admitted as cases of VL in the two hospitals were included. Records lacking major information (sociodemographic and clinical characteristics) were excluded from the analysis.

Data collection and analysis: Patients data was extracted from the patient records using standard data collection form. Variables such as age, sex, presenting features, duration of symptoms, concomitant infections, nutritional status, complete blood count and outcome were recorded. Data was entered, cleaned, and analyzed using SPSS version 25.0. Descriptive statistics in term of frequency tables with percentages, means and standard deviations was presented with relevant graphical representation for quantitative data.

Ethical considerations: Written ethical clearance and approval for conducting this research was obtained from Sudan Medical Specialization Board Ethical Committee. Ethical clearance and approval for conducting this research was also obtained from the administrative authority of Mohamed Elamin Hamid Paediatrics hospital and Tropical Diseases Hospital. As the study used data obtained from the records, patients consent were not asked for the confidentiality of patients' data was considered by coding the applied questionnaire.

Results:

Table 1: age, sex distribution and duration of fever among VL patients admitted to 2 hospitals in Omudurman, 2019-20

Variable	Description	Frequency	Percentage
Age in years	<5 years	26	37.1
	5 -10 years	26	37.1
	>10 years	18	25.7
Sex	Male	39	55.7
	Female	31	44.3
Duration of fever	< 2weeks	15	21.4
	2 – 4 weeks	38	54.3
	>4 WEEKS	17	24.3

Table 2: Clinical findings of VL patients admitted to 2 hospitals in Omudurman, 2019-20

Variable	Description	Frequency	Percentage
Bleeding tendency	Yes	10	14.3
	No	60	85.7
Jaundice	Yes	4	5.7
	No	66	94.3
Dyspnea	Yes	4	5.7
	No	66	94.3
Suspected or confirmed bacterial infection (n=67)	Yes	25	35.7
	No	42	60.0
Malnutrition	Yes	27	38.6
	No	43	61.4

Table 3: Testing status for HIV, TB and hepatitis B and C of VL patients admitted to 2 hospitals in Omudurman, 2019-20

Variable	Description	Frequency	Percentage
Tested for HIV (n=52)	Test not done	48	92.3

	Yes	0	0.0
	No	4	7.7
Tested for TB (n=67)	Test not done	61	91.0
	Yes	1	1.5
	No	5	7.5
Hepatitis B (n=66)	Test not done	55	83.3
	Yes	1	1.5
	No	10	15.2
Hepatitis C (n=67)	Test not done	55	82.1
	Yes	0	0.0
	No	12	17.9

Table 3: Laboratory findings and outcome of VL patients admitted to 2 hospitals in Omudurman, 2019-20

Variable	**Description**	**Frequency**	**Percentage**
TWBC	<or =2500	24	34.3
	>2500	46	65.7
Neutrophil count	< or = 500	4	5.7
	>500	66	94.3
Platelet count	<or= 50000	18	25.7
	>50000	52	74.3
Mode of treatment	Ambisom	19	27.1
	Pentostam	1	1.4
	Combination	50	71.4
Haemoglobin	Less than 5 g/dl	5	7.1
	5-10 g/dl	58	82.9
	More than 10 g/dl	8	11.4
Outcome	Discharge	1	1.4

	DAMA	64	91.4
	Death	5	8.6

Discussion:

This study aimed to determine clinical characteristics, laboratory findings and outcome of children with Visceral Leishmaniasis admitted to two hospitals in Omdurman, Khartoum State, 2019-20 where records of 70 case were reviewed.

The study documented that more than one third (37.1%) of the study participants were in age group of less than five years old, and 71.4% under 10 years in similar to a study done in Sudan. The results were similar to a study conducted in Brazil where the mean age was 4 years (+/-2 years) [(9)] and slightly difference from study conducted in Sudan where the majority of cases were in age group less than 14 years old with mean age of 6 years (+/-1.2 years) [(10)].

In our study more than half (55.7%) of the study participants were males with male to female ratio of 1.2:1. This was in agreement with the study conducted in Gadarif, Sudan [(10)] where 66% of participants were males; with obvious dominancy of the disease over males. However, this was slightly different from the study conducted in Brazil where 50% of cases were males [(9)]. In our study 78.6% had fever for more than 2 weeks similar to the study from Sudan where median duration of fever was 1 month [(10)].

In this study a minority (14.3%) of the study participants had bleeding tendency, a result differs from a study conducted in Albania where only 6.5% of their participants presented with bleeding tendency [(11)]. In Pakistan [(12)] bleeding tendency was reported in 8% of patients while in Brazil [(9)] reported in 29% of cases and in Nepal [(13)] the reported bleeding tendency was 23.8%.

In our study almost one third (34.3%) of the study participants documented as having concomitant bacterial infection, which was similar to a previous study conducted in Brazil [(9)]. Moreover, this study reported that more than one third (41.4%) of the study participants were malnourished.

In our study Almost three quarters of the study participants didn't undergo HIV test, majority (94.3%) of participants didn't undergo TB test, majority (84.3%) of the study participants didn't undergo hepatitis B test. While minority (1.4%) of study participants documented as hepatitis B positive, majority (82.9%) of the study participants didn't undergo hepatitis C test. This was similar to study conducted in Gadarif State, Sudan [(10)].

This study showed that the majority (88.6%) of the study participants were having hemoglobin levels of less than 10 g/dl, which almost similar to other studies [10–13]. Leukopenia, TWBCs less than 2500 in this study was reported by 34.8% and neutropenia less than 500 was found in only 5.7% in contrast to the report by Sampaio et al in Brazil [9] where neutropenia and severe leukopenia was reported among pediatric cases. Neutropenia, however, was reported in 49% of cases in other study [11]. Our study reported that platelet count less than 50000 was found among 25.7% of cases; similar to other studies in Sudan [10]. Sampaio et al in Brazil [9] confirmed the presence of bleeding in Children with Visceral Leishmaniasis where severe thrombocytopenia (platelet count <50,000/mm3) among paediatrics cases of VL was reported. Moreover, Rai et al [12] highlighted this in Pakistan.

This study documented that almost three quarters (72.9%) of the study participants were on combination therapy and the majority (88.6%) of the study participants were discharged in a good condition. Death was reported in 8.6% cases and that almost similar other studies [9].

In conclusion, the study showed that our patients have similar demographic and clinical presentation with slight change in some parameters. There is a need for early detection of different patterns of presentations of VL among pediatrics patients in Sudan, a factor which can reduce the burden of the disease and consequently reduces child morbidity and mortality. However, this raise the need for raising awareness at school level, the age where the disease is presented itself. Further researches need to be done to explore co-infection with HIV, hepatitis B, hepatitis C and TB among children with VL.

References

1. Sundar S. Visceral leishmaniasis. Trop Parasitol. 2015;5(2):83–85.
2. Torres-Guerrero E, Quintanilla-Cedillo MR, Ruiz-Esmenjaud J, Arenas R. Leishmaniasis: a review. F1000Res. 2017; 6:750.
3. Directorate of Disease Control, National leishmania Control Programme: Lesihmania Treatment Protocol in Sudan, 2016 (Unpublished document)

4. Maxfield L, Crane JS. Leishmaniasis. [Updated 2019 Jun 14]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2019 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK531456/
5. Varma N, Naseem S. Hematologic changes in visceral leishmaniasis/kala azar. Indian J Hematol Blood Transfus. 2014;26(3):78–82.
6. D. M. Bryceson, Leishmaniasis, in Manson's Tropical Diseases, G. Cook, Ed (2),1212–1243
7. E. E. Zijlstra and A. M. El-Hassan, Leishmaniasis in Sudan. Visceral leishmaniasis. Transactions of the Royal Society of Tropical Medicine and Hygiene, 2011, (9) 27–58
8. Sigdel B, Bhandary S, Rijal S. Epistaxis in visceral leishmaniasis with hematological correlation. Int J Otolaryngol. 2012; 2012:809056
9. Sampaio MJ, Cavalcanti NV, Alves JG, Filho MJ, Correia JB. Risk factors for death in children with visceral leishmaniasis. PLoS Negl Trop Dis. 2017;4(11): e877.
10. Amna El-Sadig El–Safi,etal. Hematological Profile of Patients with Visceral Leishmaniasis at Al-Gaderf State – Sudan; Vol. 2, No. 3, 2018, pp. 31-39 http://www.aiscience.org/journal/cmj ISSN: 2381-7631 (Print); ISSN: 2381-764X (Online).
11. Petrela R, Kuneshka L, Foto E, Zavalani F, Gradoni L. Pediatric visceral leishmaniasis in Albania: a retrospective analysis of 1,210 consecutive hospitalized patients (1995-2009). PLoS Negl Trop Dis. 2010;4(9):e814.
12. Rai ME, Muhammad Z, Sarwar J, Qureshi AM. Haematological findings in relation to clinical findings of visceral Leishmaniasis in Hazara Division. J Ayub Med Coll Abbottabad. 2018 Jul-Sep;20(3):40-3
13. Sigdel B, Bhandary S, Rijal S. Epistaxis in visceral leishmaniasis with hematological correlation. Int J Otolaryngol. 2012; 2012:809056. doi: 10.1155/2012/809056. Epub 2012 Jan 4. PMID: 22272206; PMCID: PMC3261463.

Knowledge, attitude, and practice about inhaled steroids among asthmatics attending to Alshaab teaching hospital

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