

Prevalence of Human Immunodeficiency Virus Among Visceral Leishmaniasis in Gadarif State-Sudan

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Abstract:-Visceral leishmaniasis is widely distributed in different environment, but more in areas with poverty and immigration rehousing projects, due to civil war and domestic issues beside of finding the main causative agent, which is sandy fly, which infect human with infection causing parasite (L.donovani), and HIV infection with regular causes can be co-exists with VL. This study aims to check HIV infection among VL infected subjects in Gadarif state. Every subject involved in this study, beside of kala-zar centers in different villages agreed to be checked later for HIV, they were 200 who tested for VL, 63 (31.5%) were positive VL, further test for HIV conducted and it was only positive in 1 (1.6%) subject. That result indicated for low frequency of co-infection of VL/HIV, which is a good thing.

Keyword:- HIV, Leishmania Donovanii, Co-Infection.

I. INTRODUCTION

The World Health Organization estimates that approximately 37 million people are currently living with HIV/AIDS¹. Human immunodeficiency virus (HIV) infection is a major public health problem globally; there are about 36.9 million people living with HIV and 2.0 million new infections are reported per year². The major burden of the disease is in sub-Saharan Africa, followed by Southeast Asia, the Americas, Europe, Western Pacific, and the Eastern Mediterranean area³. The disproportionately high HIV prevalence throughout the region suggest the lack of appropriate interventions to protect women (who considered more suspected to gain HIV infection more than men in early age) and to meet their sexual and reproductive health needs⁴. Furthermore, marked male female differences in sexual debut, age disparate sex, and transactional sex, multiple partners and partner concurrency, low condom use and sexually transmitted infections contribute to adolescent girls and young women's vulnerability to HIV⁵⁻⁶.

The World Health Organization estimates that from about 900,000 to 1.3 million new cases of leishmaniasis are reported per year; of these, approximately 0.2–0.4 million are of

visceral leishmaniasis (VL)⁷⁻⁸. Leishmaniasis is endemic in over 98 countries and territories. It affects mainly some of the poorest people on earth, and is associated with malnutrition, population displacement, poor housing, a weak immune system, and lack of financial resources⁷⁻⁹. The spread of the disease is linked to environmental changes such as deforestation, building of dams, irrigation schemes, and urbanization⁷. Civil wars, social unrest, forced displacements, migration, poverty and malnutrition, each contributing to emerging or re-emerging outbreaks of VL⁸⁻¹⁰⁻¹¹⁻¹²⁻¹³. More than 90% of global VL cases occur in six countries: Bangladesh, Brazil, Ethiopia, India, South Sudan, and Sudan and 96% of VL occur in Brazil⁷⁻⁸⁻¹⁴. The East African countries of Sudan, South Sudan, Ethiopia, Kenya, Uganda and Somalia compose one of the main geographic areas hardest hit by VL, where it is mostly caused by *Leishmania donovani*. Phlebotomine sand flies are widely distributed across East Africa and various subgenera have been reported¹⁶. Suspected vectors of *L. donovani* in East Africa include *Phlebotomus (Larrousius) orientalis*, *Phlebotomus (Synphlebotomus) martini*, *Phlebotomus (Anaphlebotomus) rodhaini* and *Phlebotomus (Synphlebotomus) celiae*¹⁷⁻¹⁸. Furthermore, *Leishmania donovani* has been reported as responsible for both cutaneous leishmaniasis and mucosal leishmaniasis in East Africa¹⁹⁻²⁰⁻²¹. The VL transmission cycle caused by *L. donovani* in East Africa is generally considered to be anthroponotic (AVL)²². The AVL reservoir is comprised of humans with active infection from VL or post-kala-azar dermal leishmaniasis. However, some reports have suggested that a second zoonotic VL (ZVL) cycle is also present in some areas, in which dogs or rodents are also major animal reservoirs²⁰⁻²³. ZVL caused by either *Leishmania infantum* or *Leishmania archibaldi* has also been observed in East Africa, such as the village of Barbar El Fugara in Al Qadarif, eastern Sudan, on the border with Ethiopia²⁰. The visceral kala-azar in Asia, is characterized by prolonged fever, splenomegaly, hepatomegaly, substantial weight loss, progressive anemia, pancytopenia, and hypergammaglobulinemia and is complicated by serious infections. It is the most severe form of the disease and, left untreated, is usually fatal²⁴⁻²⁵⁻²⁶⁻²⁷.

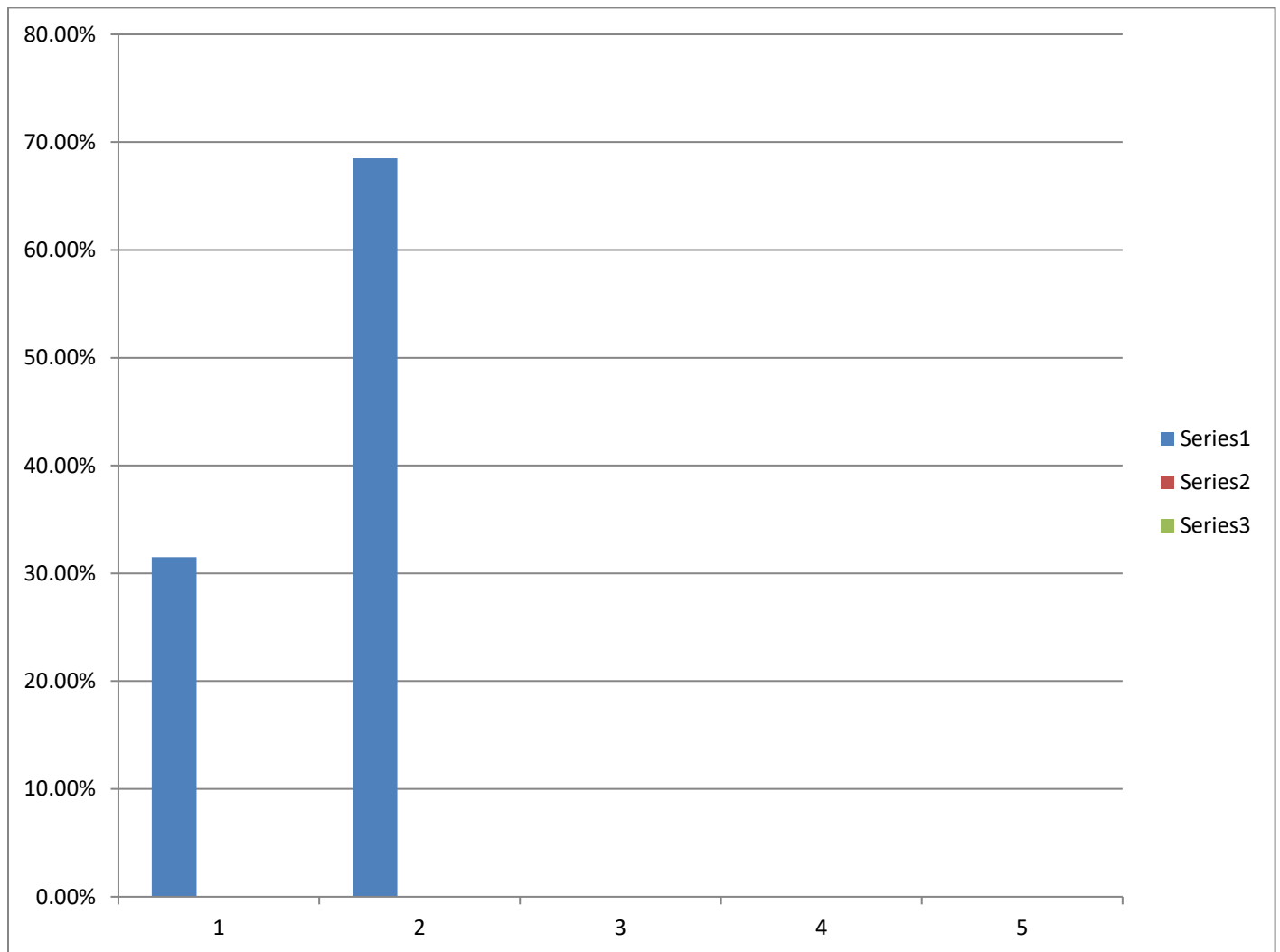
II. MATERIAL AND METHOD

This cross sectional study involved 200 residents of boarder villages of Gadarif state, the living status of those villages indicated for poor and low life style due to poverty and rehousing program due to moving of people from different areas because of the war and instability locations. Their mean±SD of age was (11.70±10.0) years, whole blood samples were collected under hygienic condition, allowed to clot formation and then serum separated and they were tested for visceral leishmaniasis, which conducted viadetection of parasite antigen in blood samples by specific antileishmanial antibodies, immunochromatography test (ICT). ELISA kit used in HIV screening was Diagnostic trade mark, which

conducted as two steps of incubation antigen(sandwich) enzyme immune assay kit, which uses polystyrene micro well strips pre-coated with recombinant HIV antigens, which later are detector for HIV positivity when whole procedure completed as the protocol describes it’s steps.

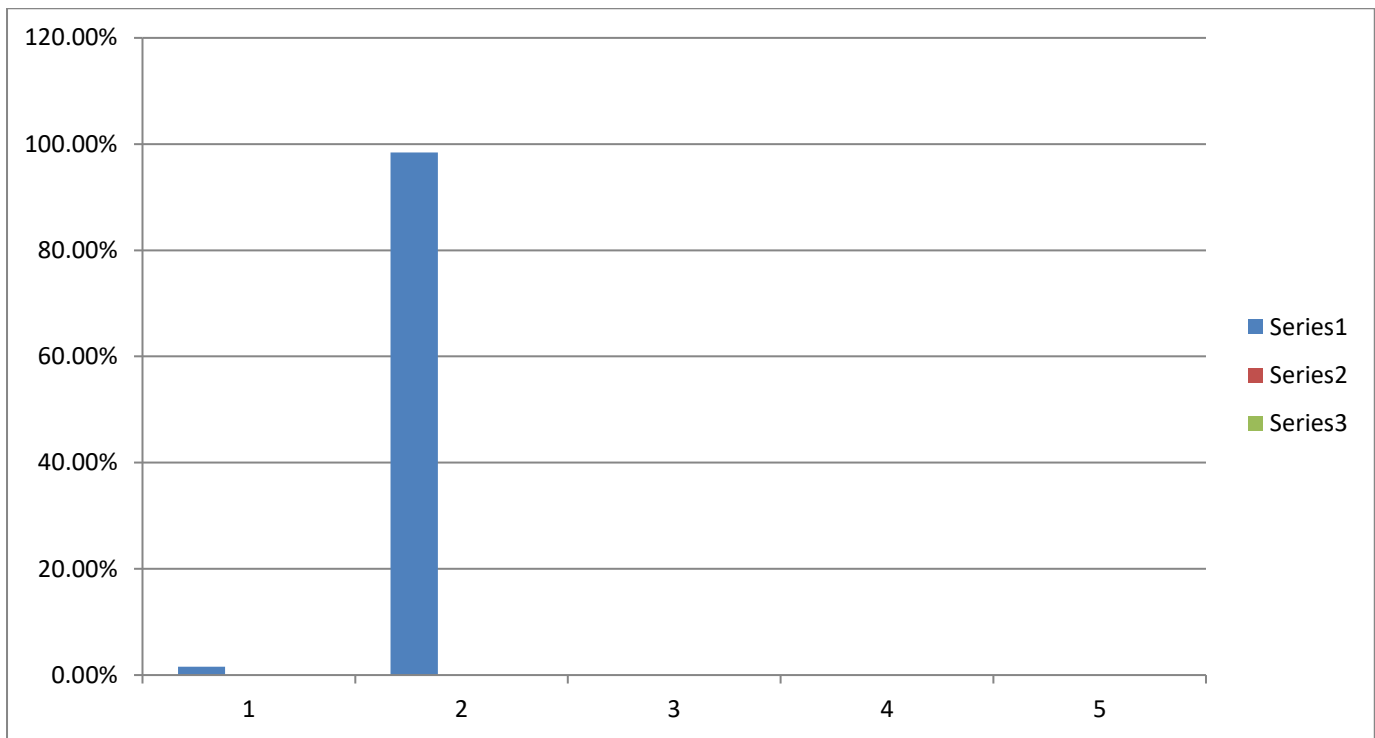
III. RESULT

200 residents were enrolled in VL testing, Kala-zar hospital in Gadarif. 63 (31.5%) of tested subjects were positive for VL as in figure 3-1, they further enrolled in screening of HIV by means of enzyme linked immune assay (ELISA), 1 (1.6%) brought a positive result of HIV as in figure 3-2, she was a female, she didn’t has a history of travelling in between areas nor blood transfusion for emergency needs.



1= positive VL and 2=Negative VL

Figure 1. Comparison of VL Positive to Negative VL Tested Subjects



1=positive HIV (1.6%) and 2= negative HIV (98.4%)

Figure 2. Positive and Negative HIV Result among VL

IV. DISCUSSION

The devastating impact of HIV/AIDS is unprecedented, with more than 33 million individuals now infected globally²⁸. In addition to 2 million deaths occurring annually as a result of HIV/AIDS, its regional economic, health, and social impacts have been well documented. The pandemic continues to affect the livelihoods of individuals, families, and communities, especially in sub-Saharan Africa. In regions of the world most affected by HIV/AIDS, the pandemic is occurring in the context of massive environmental and societal changes. Global climate change, human industry, and shifting patterns of migration because of poverty, inequality, and conflict are dramatically altering the social and natural environment of those regions most affected and may play a key role in driving and sustaining the pandemic²⁹⁻³⁰. In this study, leishmaniasis and HIV co-infection found in trace percentage of infected people, this in agreement with several studies, one of them mentioned that leishmaniasis – human immunodeficiency virus (HIV) co-infection can manifest itself as tegumentary or visceral leishmaniasis. Almost 35 countries have reported autochthonous co-infections. Visceral leishmaniasis is more frequently described³¹. And also an Ethiopian study did observed the same finding but in high frequency, as conducted among subjects with co-infection and symptoms they were

presented, the study suggested that they were due to having HIV rather than leishmania and that what makes death rate increased among co-infected patients³². An European observation also commented on VL/HIV co-infection and it revealed that, VL cases in Mediterranean area account for 5%–6% of the global burden. Cases of Leishmania/HIV co-infection have been reported in the Mediterranean region, mainly in France, Italy, Portugal, and Spain. Since highly active antiretroviral therapy was introduced in 1997, a marked decrease in the number of co-infected cases in this region has been reported³³.

V. CONCLUSION

In infected villages of Gadarif state, visceral leishmaniasis is present due to transmitter agent and suitable environment for its survival, co-infection with HIV found in trace percentage, that may be to raised awareness whether morally or hygienic and these factors definitely if they spread enough, would protect people against a lot.

VI. RECOMMENDATION

Limitation of immigration and raise people life style should be planned, as they could be cause of environmental changes locally that limit endemic disease disorders.

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