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CASE REPORT

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Visceral leishmaniasis in non-endemic rural hilly region of Nepal: A case report

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Abstract

Visceral leishmaniasis is the most severe form of leishmaniasis, caused by the obligate intracellular protozoan parasites *Leishmania donovani* or *L. infantum*, transmitted by the bite of phlebotomine sand fly. Visceral leishmaniasis is a disease of lowlands and uncommon in highlands. We report a case of visceral leishmaniasis in 13-year-old female patient from a village of Arghakhanchi situated at an altitude of 1200 m.

KEYWORDS

hilly, Nepal, non-endemic, visceral leishmaniasis

1 | INTRODUCTION

Visceral leishmaniasis (VL), also known as Kala-azar is the most severe form of leishmaniasis, caused by obligate intracellular protozoan parasites *Leishmania donovani* or *L. infantum*, transmitted by the bite of phlebotomine sand fly.[1] Out of 200 countries, 98 countries are endemic to visceral leishmaniasis.[2] Every year, 50,000 to 90,000 new cases of visceral leishmaniasis occur worldwide.[2] In Southeast Asia Region (SEAR) countries, Kala-azar occurs predominantly in India, Bangladesh, and Nepal. Kala-azar is a major public health problem in Nepal.[3] Twelve districts in the eastern and central Terai regions bordering the northern state of Bihar, India, are endemic for Kala-azar.[3] Over 8.5 million people living in these endemic districts are at risk of Kala-azar.[3] However, in 2019, 23 districts were considered endemic in Nepal.[4] The highest number of Kala-azar cases was reported in 2003 and since then cases are in a decreasing trend and in 2019, 186 VL cases were found in Nepal.[4]

Visceral leishmaniasis is a disease of poverty and affects people of low socioeconomic status.[3] It is almost absent in highlands as higher altitudes negatively affect the distribution of vector.[5] The clinical symptoms include long-term, low-grade fever, muscle wasting, anemia, leukopenia, hepatosplenomegaly, polyclonal hyper-gammaglobulinemia, and weight loss.[6] Visceral leishmaniasis is fatal if left untreated in over 95% cases.[7]

Diagnosis can be made by demonstration of the parasites in splenic and/or bone marrow aspirate, serological tests using rk39 in enzyme-linked immuno-sorbent assay (ELISA) or rapid immunochromatography, direct agglutination test (DAT), immunoblotting, polymerase chain reaction (PCR), etc.[8] We report an indigenous case of visceral leishmaniasis in a 13-year-old female patient residing in non-endemic hilly regions of Nepal.

2 | CASE PRESENTATION

Here, we describe a 13-year-old female patient from Arghakhanchi district who presented to our local clinic with complaints of intermittent fever with chills and bouts of profuse sweating since 1 month. She had not been well despite few courses of antibiotics and antipyretics. Fever was happening at intervals and associated with lassitude and dry cough. She had no travel history to endemic areas. She was an orphan brought by her relatives who too belonged to a poor socioeconomic status.

She was pale and febrile to touch with a sick look, but well oriented to time, place, and person. She had low-grade temperature of 99.4°F, and was tachypneic and tachycardic. Saturation was maintained at 97% in room air. There was no icterus, lymphadenopathy, cyanosis, clubbing, and edema. Sternal tenderness was absent. Systemic evaluation of organ systems was remarkable with massive splenomegaly in the spleno-umbilical axis and mild hepatomegaly with liver palpable two fingers below the right midclavicular line.

Hematology revealed bicytopenia with moderate anemia (Hb of 5.2%) and mild leucopenia (TLC-3150, ANC count of 1386). Biochemistry profile revealed normal blood sugar and electrolytes. Erythrocyte sedimentation rate was 46 mm/h, and CRP was reactive. Alanine aminotransferase (ALT) and aspartate aminotransferase (AST) were 130 U/L and 143 U/L. Chest X-ray was normal. Electrocardiogram showed normal findings. Ultrasonography (USG) of abdominal revealed gross hepatosplenomegaly with the liver size of 16.2 cm and spleen size of 18.1 cm. rK-39 test was positive suggesting *Leishmania* infection. We ruled out HIV with negative Rapid Diagnostic Kit (RDT) kit, and tuberculosis (TB) with normal X-ray, and a negative purified protein derivative (PPD) test. Peripheral blood smear was conducted to rule out hematological malignancy. Lactate dehydrogenase (LDH) was only marginally elevated.

The patient was treated with single dose of liposomal amphotericin B single dose as per national guidelines and a transfusion of 2 units of packed red blood cells (RBCs). Follow-up was done at 2 weeks with a significant clinical improvement noted with increased hemoglobin level, reduction in size of liver to 11.2 cm, elevated AST and ALT returned to baselines, and marked reduction in spleen size by about 4 cm (from 18 cm to 14 cm).

3 | DISCUSSION

Visceral leishmaniasis is a disease of low altitudes. It is usually found below the altitudes of 600 m above sea level.[9] It is almost absent in highlands as higher altitudes negatively affect the distribution of vector.[5] Phlebotomine sandflies are generally characterized as thermophilic species, and temperature is an essential factor for their development and survival of different life stages. Hence, VL is restricted to warm climatic conditions, that is, mainly to the tropics and subtropics.[10] However, because of climate warming, phlebotomine sandflies could expand their potential range toward the north in Europe.[10] 98 countries are endemic to visceral leishmaniasis.[2] Over the last decade, a sharp increase in imported leishmaniasis cases has been reported in industrialized, non-endemic areas. Increased international travel, military activities, and immigration are primarily thought to be responsible.[11]

Our patient had no history of underlying heart disease, there was no murmur, and echocardiographic findings were normal which ruled out infective endocarditis. Similarly, we ruled out HIV with negative Rapid Diagnostic Kit (RDT) kit, and tuberculosis (TB) with normal X-ray, and a negative purified protein derivative (PPD) test. Leukemia another differential was ruled out since she had no history of bleeding disorder, bone pain, and lack of pancytopenia on laboratory findings; also, she responded well to amphotericin treatment. After ruling out other main differential diagnosis, we suspected visceral leishmaniasis and upon its work up rK-39 came to be positive which confirmed our diagnosis.

In the present case, we report an index case of VL from a non-endemic hilly region situated at an altitude of 1200 m. The patient and family members deny travel history for the past few years. Few similar case reports have been available from hilly region of Nepal in recent years. A case was reported from Doti district in 2011 with frequent relapses.[12] Detailed reporting of such indigenous cases is lacking.[4] This is suggesting an epidemiological shift taking place with new foci being reported from natives of non-endemic areas.

The VL elimination program of Nepal aims at reducing incidence to 1 per 10,000 at district level.[4] Liposomal amphotericin B at the dose of 10 mg/kg single dose over 2 h is the first line of treatment guidelines for VL as per

Epidemiology and Disease Control Division, Nepal.[13] However, government's program for elimination of leishmaniasis is restricted mostly in endemic districts. A trend of sporadic VL cases from non-endemic regions of the country challenge the aim of VL elimination. Active VL and entomological surveillance are likely to be needed in the hilly areas in near future if similar cases continue to be reported.

Rarity of the disease in non-endemic areas leads to delayed suspicion and care of patients with leishmaniasis. Tissue samples for diagnosis are risky and often unavailable in low-resource settings.[14] Rapid diagnostic tests (RDTs) are generally used in such settings.

4 | CONCLUSION

Visceral leishmaniasis is endemic in lowland regions. A high index of suspicion is needed in appropriate clinical setting even in high altitudes due to possible vector expansion to these areas.

AUTHOR CONTRIBUTIONS

KD and SS wrote the original manuscript, reviewed, and edited the manuscript. KB designed the study, reviewed, and edited the original manuscript. SS, KD, KB, SBT, and SN were involved in management of the patient and reviewed the manuscript.

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CONFLICT OF INTEREST

None.

ETHICAL APPROVAL

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CONSENT

Published with the written informed consent of the patient.

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