CLINICAL AUDIT

https://doi.org/10.3126/njms.v10i2.80477

Challenges and Changing Trends in Visceral Leishmaniasis: A Study at Bheri Hospital, Nepal

Rajan Pande[1], Pragya Gautam Ghimire[2], Prasanna Ghimire[3], Roma Bora[4], Raju Jayshwal[5]

[1]Chief Consultant Physician, Department of Internal Medicine, Bheri Hospital, Banke, Nepal.
[2]Associate Professor, Department of Pathology, Nepalgunj Medical College and Teaching Hospital, Banke, Nepal
[3]Associate Professor, Department of Radiology, Nepalgunj Medical College and Teaching Hospital, Banke, Nepal
[4]Professor, Department of Pediatrics, Nepalgunj Medical College and Teaching Hospital, Banke, Nepal
[5]Resident, Department of Radiology, Manipal College of Medical College, Pokhara, Nepal

Received: October 23, 2024 **Accepted: May 20, 2025** **Published: June 30, 2025**

Cite this paper: Pande R, Ghimire PG, Ghimire P, Bora R, Jayshwal R. Challenges and Changing Trends in Visceral Leishmaniasis: A Study at Bheri Hospital, Nepal. *Nepal Journal of Medical Sciences*. 2025;10(2):20: 82- 89 https://doi.org/10.3126/njms.v10i2.80477

ABSTRACT

Introduction: Visceral Leishmaniasis (VL) is one of the major public health problems of Nepal and is almost a fatal disease if not managed timely. VL cases have been reported in Nepal since 1980. The Government of Nepal is committed to reducing VL morbidity and mortality and to eliminating this disease through early case detection and treatment via effective diagnostic and treatment facilities at hospitals and health facilities through various trainings on revised national guidelines and treatment protocol, review meetings, disease surveillance, indoor residual spraying in priority affected areas by 2026. The study was conducted to investigate the current challenges and evolving trends in the epidemiology, clinical presentation, diagnosis, and management of visceral leishmaniasis at Nepal, with the goal of informing improved healthcare strategies and control measures.

Methods: This prospective hospital-based study was conducted in the Department of Medicine, Bheri Hospital, Nepal, from July 2016 to June 2018. Data were entered in Excel and analyzed using SPSS 18th version. Descriptive data were presented in a pie chart and table with frequency and percentages.

Results: A total of 60 patients were diagnosed with VL during the study period. Males comprised 52 (87%) and females 8 (13%) patients. Eighty-eight percent (53) of patients were above 15 years of age and twelve percent (7) were below 15 years. The median age was found to be 28 years. Twenty (33%) patients belonged to hilly regions, 31 (52%) were from Terai and 9 (15%) patients belonged to mountains. Our result shows that VL is not only found in the South and East but also prevalent in the North and West, it is not only seen in the Terai region but also found in hills and mountain regions. Relapse after treatment with liposomal amphotericin B was seen in 10 (16.7%) cases.

Conclusions: VL is a chronic protozoal infection requiring specific and expensive treatment, having near 100% mortality if not treated in time. Relapses made the disease further challenging. Reporting cases from so-called nonendemic areas has made this disease more challenging. Urgent revision of treatment protocol is needed for appropriate management of visceral leishmaniasis and to prevent relapse and expansion of dedicated kala-azar elimination program in a new emerging geographical area is demanding.

Keywords: *Liposomal amphotericin B; Chronic protozoal infection; Kala-azar.*

Corresponding Author: Dr. Pragya Gautam Ghimire, Associate Professor, Department of Pathology, Nepalgunj Medical College and Teaching Hospital, Banke, Nepal. Email Id: drpragya@gmail.com

INTRODUCTION

Visceral Leishmaniasis (VL) or Kala-azar is one of the major public health problems of Nepal. It is caused by Leishmania donovani and transmitted by sand flies (phlobotomus spp.). Humans are the only known reservoir (anthroponotic transmission) in Nepal.[1] It is almost a fatal disease if not managed timely.[2]

Nepal, India, Bangladesh, Brazil, and Sudan constitute over 90% global burden of Visceral Leishmaniasis with South Asia having an approximate burden of 60%. Every year an estimated 200-300 cases are reported in Nepal, especially from VL-endemic Southern and eastern Terai parts where 12 Nepalese districts adjoining Bihar state of India which is also highly VL endemic [3,4,5] VL has been reported in Nepal since 1980. The eastern part of the country mainly has a disease burden. Previously, twelve districts of Eastern Terai mainly Siraha, Dhanusa, and Mahottari were endemic areas of the country whereas cases have also been reported from other parts of the country. Now, forty-two districts are endemic to Kala-azar.

The Government of Nepal is committed to reducing VL morbidity and mortality and to eliminating this disease through early case detection and treatment via effective diagnostic and treatment facilities at hospitals and health facilities through various trainings on revised national guidelines and treatment protocol, review meetings, disease surveillance, indoor residual spraying in priority affected areas by 2026.[6] For early diagnosis of VL cases, now rapid diagnostic tests (rK39) to detect antibodies to recombinant antigen rK39 are available which are highly sensitive and specific.[7] There are many therapeutic options available for the treatment of kala-azar. VL is a disease of poor people mostly affecting the individuals living in mud or grass-covered houses. [8,9] The aim of study is early detection and management of visceral leishmaniasis.

MATERIALS AND METHODS

This prospective hospital-based study was done in the Department of Medicine, Bheri Hospital, Nepal, from July 2016 to June 2018. Bheri Hospital is a referral hospital with 150 beds. Patients who are suspected of VL from various parts of Western Nepal and nearby hospitals are referred to our hospital for confirmation of diagnosis and to give free drugs to the patients. Patients having fever for more than 14 days, weight loss, splenomegaly, positive rk39 test, and pancytopenia or bi-cytopenia were included in our study. All the patients were HIV-negative.

Patients with no history of travel to endemic areas were also included in our study. After confirmation of the diagnosis patients were treated with liposomal amphotericin B (5mg/kg/d for 3 days) days) or Liposomal amphotericin B 10mg/kg single dose as per National protocol for the treatment of visceral leishmaniasis. Two cases were treated with miltefosine due to the unavailability of liposomal amphotericin B at that time. Relapsed cases were referred to a higher center for further management. Data were entered in Excel and analyzed in SPSS 18th version. Descriptive data were presented in a pie chart and table with frequency and percentage.

RESULTS

A total of 60 patients were diagnosed with VL during the study period. Males comprised 52 (87%) and females 8 (13%) patients. Eighty-eight percent (53) of patients were above 15 years of age and twelve percent (7) were below 15 years. The median age was found to be 28 years. Twenty (33%) patients belonged to hilly regions, 31 (52%) were from Terai and 9 (15%) patients belonged to mountains. Our result shows

that VL is not only found in the South and East but also prevalent in the North and West, It is not only seen in the Terai region but also found in hills and mountain regions. Recent travel history to different state of India was seen in 26 patients (43 %) out of 60 patients. Out of a total of 60 patients included in the study, fever was observed in all patients (100%), indicating it was the most consistent clinical feature. Weight loss was reported in 58 patients (97%), making it another highly prevalent symptom. Skin pigmentation and hepatomegaly were each noted in 31 patients (52%), suggesting a moderate frequency of these signs. Abdominal distension was present in 39 patients (65%), while pallor was seen in 54 patients (90%). Splenomegaly was detected in 59 patients (98%), making it the second most common clinical finding after fever. Relapse was seen in 10 (16.7%) cases. Among relapsed cases, 9 (90 %) were initially treated with liposomal amphotericin B. Only one (10 %) relapse was seen while treatment with miltefosine. Bone marrow aspiration for confirmation of diagnosis of relapse was done in all 10 relapsed cases. One (10 %) patient died during the treatment. Positive rk39 test was observed in all 60 (100%) patients.

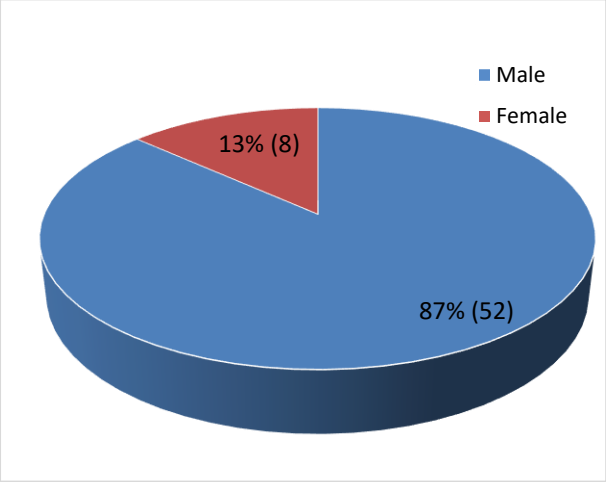

Figure 1: Sex Distribution of patients

Table 2: Clinical Features of VL patients(n=60)

Clinical Features	Number (n)	Percentage (%)
Fever	60	100
Weight Loss	58	97
Skin Pigmentation	31	52
Abdominal Distension	39	65
Pallor	54	90
Splenomegaly	59	98
Hepatomegaly	31	52

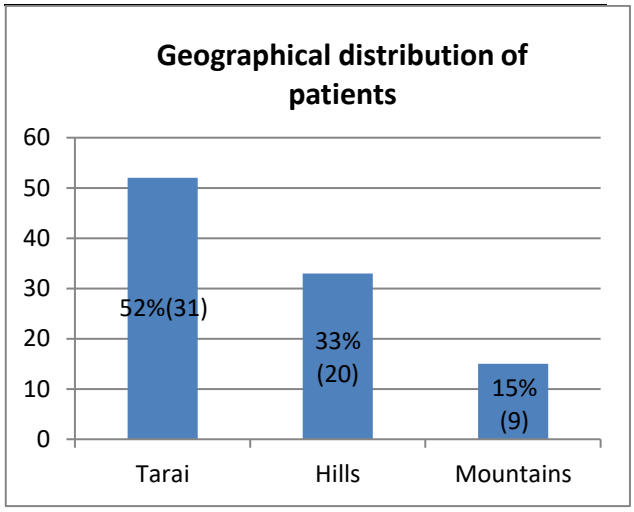

Figure 2: Geographical distribution of patients

DISCUSSION

This study highlights the evolving epidemiology and challenges of visceral leishmaniasis (VL) in Nepal. Historically, VL was regarded as a Terai problem, but cases are now increasingly being reported from hilly and even mountainous regions, suggesting new areas of concern. This increases the complexity of the elimination strategies and requires stronger surveillance systems and resource distribution. As is typical with VL, fever, headache, weight reduction, splenic enlargement, and anemia were the most prevalent clinical signs. Still, the 16.7% relapse

rate even after liposomal amphotericin B treatment is very troubling and raises issues such as drug resistance or treatment failure. VL being a public health problem our government has made considerable efforts to eliminate this disease from the country [10,11]. Despite the best efforts of the government in the form of provision of free diagnostic and treatment facilities elimination of the disease is very challenging because it is also reported from the nonendemic regions of the country. Kala Azar is seen throughout the globe affecting about 89 countries. Asia, Africa, America, and the Mediterranean region are endemic for VL. [12,13] Approximately 350 million people are at risk of developing VL, and around 12-15 million people are infected throughout the world. This disease causes 70,000 deaths and 1.5-2 million new cases reported every year of VL.[14] Nepal is one of the 13 high-burden disease countries (Bangladesh, China, Ethiopia, Georgia, India, Kenya, Paraguay, Somalia, South Sudan, Spain, Sudan, and Uganda).[15]Once thought as a panacea for the treatment of VL, 16.7% of patients relapsed even after treatment with liposomal amphotericin B. Recently there has been a report of a new variant (Yeti) of VL which may be postulated to be the cause of drug resistance to liposomal amphotericin B[16]. Many people from Western Nepal go to Uttarakhand to earn their livelihood working there as masons and live in poor muddy housing conditions. Uttarakhand is not a labeled VL endemic zone so cases of VL are also missed from this state too. Uttarakhand, Western, and hilly mountainous parts of Nepal share a common ecological niche. This may be one of the causes of case reporting from different districts of Uttarakhand, Western and hilly mountainous part of Nepal. Eastern Nepal, Bihar, and Bangladesh have common social and living conditions. Similar study conducted in the eastern part of Nepal and found domestic animals to be potential reservoir hosts [17]. So further research is required for the estimation burden of zoonotic transmission of VL. Many drugs are available for the treatment of VL, Oral Miltefosine Paromomycin, and Liposomal Amphotericin B. [18,19] In our country we use a single dose of Liposomal Amphotericin B(10mg/kg) or Injection Liposomal Amphotericin B(5mg/kg/day) for three days and in relapse cases go for a higher dose of Liposomal Amphotericin B or Paromomycin and Miltefosine.

Our study showed a male preponderance with 87% of cases being males and the rest 13% being females which is also supported by other studies as well. The cause of male preponderance may be the disease being prevalent in masons that go outside to earn their livelihood, living in poor housing conditions are usually males. Eighty-eight percent (53) of patients were above 15 years of age and twelve percent (7) were below 15 years. A similar type of age distribution is also seen in a study conducted at the Institute of Medicine, Kathmandu.[1] Past study in Algeria found VL to be affecting all age groups mainly males. [20] They observed 31.41% of patients in the age group of 10-19 years and 25.7% of patients were less than 9 years of age. Thirty-three (33%) of our patients belonged to the hilly region, 31 (52%) were from the terai and 9 (15%) patients belonged to the mountains. A similar type of geographical distribution is also seen in a past study who observed 28% of patients belong to endemic areas and 72% from nonendemic areas.[10] Seventy percent of their patients belong to hilly regions, 20% belong to terai and the rest 10% belong to mountains. All of our patients had fever followed by splenomegaly (98%), weight loss (97%), and pallor (90%). Similar clinical picture also observed in past study, fever in all of their patients whereas weight loss and pallor were seen in 94% and 50% of their patients respectively.[21] All of our patients had positive rk39 tests, whereas 80% of

patients had positive rk39 tests remaining 20% were diagnosed by demonstration of LD bodies in the bone marrow in past study.[22] The government of Nepal has given single dose liposomal Amphotericin B (10mg/kg) or (5mg/kg/dose) for 3 consecutive days regimen. There are 1/5th relapse within one year so to continue the same regimen is controversial.

This is the only drug approved by the U.S Food and Drug Administration (FDA) for the treatment of VL with the regimen of 3mg/kg/daily from day 1 to day 5 and then on the 14th and 21st day (Total dose of 21mg/kg). However, the total dose requirement for different regions of the world varies widely. In Asia, it is 10-15mg/kg, In Africa 18mg/kg, and in the Mediterranean/American region >20mg/kg. The daily dose is flexible (1-10mg/kg). In a study in India, a single dose of 10mg/kg and cure rate of infection in 96% of the patients. [23] Institute of Tropical Medicine (ITM) in Antwerp and BP Koirala Institute of Health Science (BPKIHS) has reported a new variant of the VL parasite in the Indian subcontinent.[24] A similar strain was also reported from remote Nepalese highlands. These parasites are labeled as (Yeti) variants due to their geographical origin.[16]

An increase in cases originating from nonendemic regions and treatment relapse underscores the importance of changing national treatment guidelines, improving diagnostic capabilities, and broadening vector control measures. Improving education and access to healthcare in newly endemic areas is crucial for the fulfillment of VL elimination objectives for the year 2026.

This study was limited by its single-center design, small sample size, and lack of long-term follow-up. Diagnostic limitations and the absence of environmental or vector-related data may have affected the comprehensiveness and generalizability of the findings.

CONCLUSIONS:

VL is a chronic protozoal infection that requires specific and expensive treatment, having nearly 100% mortality if not treated in time. Relapses in standard National guidelines guided single dose of Liposomal Amphotericin B(10mg/kg) or Liposomal Amphotericin B(5mg/kg/day) for three days made the disease further challenging. Reporting cases from so-called non-endemic areas has made this disease more challenging. Nepal Government has provided free VL diagnosis and drugs at public health facilities making it accessible to the patient and helping to reduce the disease burden. Urgent revision of the National kala-azar treatment protocol is needed for appropriate management of visceral leishmaniasis and to prevent relapse and expansion of dedicated kala-azar elimination program in new emerging geographical areas is demanding. Visceral leishmaniasis remains a significant public health challenge in Nepal, with changing epidemiological patterns and increasing cases in previously non-endemic hilly and mountainous regions. Despite the use of standard treatment, relapse rates remain a concern. Early diagnosis, timely treatment, and revised national protocols are essential for effective disease control. Strengthening surveillance, expanding healthcare access, and targeting emerging endemic areas are crucial steps toward achieving the national goal of VL elimination by 2026.

CONFLICT OF INTEREST

None

SOURCES OF FUNDING

None

REFERENCES

1. Joshi DD, Sharma M, Bhandari S. Visceral Leishmaniasis in Nepal during 1980-2006. J Common Dis 1986; 38:139-48.

2. Andrade-Narváez FJ, Vargas-González A, Canto-Lara SB, et al. Clinical picture of cutaneous leishmaniases due to Leishmania mexicana in the Yucatan peninsula, Mexico. Mem Inst Oswaldo Cruz.2001;96(2):163-7. [DOI]

3. Epidemiology and Diseases Control Division, Government of Nepal, Ministry of Health and Population, Department of Health Services. Annual Health Report- Kala Azar. 2016-17;134-8.

4. World Health Organization. Report of the Fifth Consultative Meeting on Leishmania/HIV Co-infection. Addis Ababa, Ethiopia, 2007. March 20-22:

5. Joshi A, Narain JP, Prasittisuk C et al. Can visceral leishmaniasis be eliminated from Asia? J Vector Borne Dis.2008;45:105-11. [DOI]

6. World Health Organization. Regional strategic framework for the elimination of kala-azar from the South-East-Asia Region (2005-15). WHO SEAR, New Delhi, India, 2005.

7. Singh SP, Reddy DC, Rai M, Sundar S. Serious underreporting of visceral leishmaniasis through passive case reporting in Bihar, India. Trop Med Int Health,2006; 11: 899-905. [DOI]

8. Joshi A. Kala-azar status in SEA Region. Current disease burden. Available: http//www.searo.who.int/EN/Section10/Section2163_1668.htm, Accessed 14 January 2019.

9. Alvar J, Yactayo S, Bern C. Leishmaniasis and poverty. Trends Parasitol, 2006;22:552-7. [DOI]

10. Pun SB, Sato T, Pandey K, Pandey BD. Changing trends in visceral leishmaniasis. 10 years' experience at a referral hospital in Nepal. Trans R Soc Trop Med Hyg. 2011;105:550-4. [DOI]

11. Shaw J. The leishmaniases-survival and expansion in a changing world. A mini-review. Mem Inst Oswaldo Cruz.2007;102:541-7. [DOI]

12. Boelaert M, Meheus F, Sanchez A, Singh SP, Vanlerberghe V. The poorest of the poor: a poverty appraisal of households affected by visceral leishmaniasis in Bihar, India. Trop Med Int Health 2009;14:639-44. [DOI]

13. Reithenger R, Dujardin J, Louzir H. Cutaneous Leishmaniasis. Lancet Infect Dis 2007;(9):581-96. [DOI]

14. Kashif M, Manna PP, Akhter Y. Screening of novel investors against leishmania donovani calcium ion channels to fight leishmaniasis. Infect discord drug target 2016;16-21. [DOI]

15. Bravo F, Sanchet MR. New and re-emerging cutaneous infectious diseases in Latin America and other geographic areas. Dermatol Clin. 2003;21(4):655-68. [DOI]

16. Cuypers B, Berg M, Imamura H et al. Integrated genomic and metabolomic profiling of ISC1, an emerging Leishmania donovani population in the Indian subcontinent. Infection, Genetics and Evolution.[DOI]

17. Bhattarai NR, Van der Auwera G, Rijal S et al. Domestic animals and epidemiology of visceral leishmaniasis. Emerg Infect Dis. 2010;16:231-7. [DOI]

18. Bhattaacharya SK, Sinha PK, Sundar S, Thakur CP,Jha TK. Phase 4 trial of miltefosine for the treatment of Indian Visceral leishmaniasis. J Infect Dis 196:591-8. [DOI]

19. Sundar S, Jha Tk, Thakur CP, Bhattacharya SK, Rai M. Oral miltefosine for the treatment of Indian Visceral leishmaniasis. Trans R Soc Troop Med Hyg 2006; 100(Suppl1);26-33. [DOI]

20. Khezzani B, Bouchemals: Demographic and spatiotemporal distribution of cutaneous leishmaniasis in the soup oasis (Eastern south of Algeria): Results of 13-year Acta Trop. 2017;166:74-80. [DOI]

21. Bern C, Joshi AB, Jha SN et al. Factors associated with leishmaniasis in Nepal: bed - net use is strongly protective: Am.J.Trop. Med.Hyg.63: (34);2000 pp.184-8. [DOI]

22. Pun SB, Pandey K, Shah R. A series of case reports of autochthonous visceral leishmaniasis, mostly in non-endemic hilly areas of Nepal. Am.J.Trop Hyg. 2013 feb 6; 88(2);227-9. [DOI]

23. Sundar S. Leishmaniasis. In: Kasper DL, Hauser SL, Jameson JL, Fauci AS, Longo DL, Loscalzo DL, Loscalzo J. Harrisons Principles of Internal Medicine. 19th ed. McGraw Hill Education;2012. p.1387-94

24. Bhattarai NR, Rai K, Uranw S, Khadka DK, etal. Can cutaneous leishmaniasis provoke a resurgence of kala-azar in the Indian subcontinent? BMC Infect Dis. 2025 Feb 26;25(1):281. [DOI].