Research Article ISSN 2639-8478

Cancer Science & Research

Diffuse Large B-Cell Lymphoma in Nepal: Analysis of Clinicopathological Features, Management, and Survival Outcome in Retrospective Cohort

Ajaya Kumar Jha[1]* and Arvind Kumar Sinha[2]

[1]*Department of Hematology and Medical Oncology, Vayodha Hospital, Nepal.*

[2]*Department of Pathology, Vayodha Hospital, Nepal.*

***Correspondence:**
Dr. Ajaya Kumar Jha, Consultant Hematologist, Department of Hematology and Medical Oncology, Vayodha Hospital, Nepal, ORCID: https://orcid.org/0009-0000-4086-5525.

Received: 22 Sep 2026; **Accepted:** 28 Oct 2026; **Published:** 08 Nov 2026

Citation: Ajaya Kumar Jha, Arvind Kumar Sinha. Diffuse Large B-Cell Lymphoma in Nepal: Analysis of Clinicopathological Features, Management, and Survival Outcome in Retrospective Cohort. Cancer Sci Res. 2026; 9(4): 1-5.

ABSTRACT

Introduction: *Diffuse large B-cell lymphoma (DLBCL) is the most common subtype of non-Hodgkin lymphoma (NHL) and represents a clinically and biologically heterogeneous group of aggressive lymphoid malignancies. Despite advances in chemo-immunotherapy, relapse and refractory disease remain important challenges, particularly where access to advanced diagnostics and treatment modalities are limited.*

Objective: *To describe the clinicopathological characteristics, treatment modalities, and treatment outcomes of adult patients diagnosed with DLBCL at a tertiary care center in Nepal.*

Methodology: *This retrospective cohort study included adult patients diagnosed with DLBCL and treated at Vayodha Hospital between January 2018 and December 2023. Patients were followed until December 2025. Demographic characteristics, clinical presentation, disease distribution, staging and treatment modalities were reviewed from medical records. Treatment outcomes, including relapse and mortality, were analyzed. A total of 35 adult patients were included.*

Results: *The mean age at presentation was 45 years, with an age range of 21–76 years. The male-to-female ratio was 1.18:1. Sixteen patients (46%) were between 40 and 60 years of age. Twenty-five patients (71%) presented within 1–3 months of symptom onset. B symptoms were documented in 14% of patients. Nodal disease was present in 20 patients (57%), while 15 patients (43%) had extranodal disease. Extranodal sites included the gastrointestinal tract, tonsil, thyroid, spine and testis. Bulky disease was observed in 14% of patients, commonly involving the axilla and mediastinum. Contrast-enhanced computed tomography was used for staging and response assessment in 80% of patients, while positron emission tomography-computed tomography was used in 20%. Stage II disease constituted the largest group (71%), while 23% had advanced-stage disease. Cyclophosphamide, doxorubicin, vincristine and prednisolone (CHOP)-based therapy was administered to 18 patients (51%), whereas 17 patients (49%) received rituximab-based treatment. Eleven patients (31%) experienced relapse and four (11%) died from refractory or progressive disease. Thirty-one patients (88%) remained alive and were followed up. The mean duration of follow-up was 72.3 months (range 8–96 months).*

Conclusion: *In this Nepalese cohort, DLBCL commonly presented during the fifth decade of life, with nodal disease being more frequent than extranodal disease. Although the majority of patients received treatment, almost one-third experienced relapse. Financial limitations affecting access to advanced investigations and treatment may influence management. Relapsed DLBCL remains a significant therapeutic challenge, particularly where transplantation and other advanced treatment options are unavailable.*

Keywords
Diffuse large B-cell lymphoma, Non-Hodgkin lymphoma, Treatment outcome, Relapse, Nepal.

Introduction
Non-Hodgkin lymphoma (NHL) represents a diverse group of hematological malignancies arising from lymphoid cells. Diffuse large B-cell lymphoma (DLBCL) is the most common subtype of NHL and is characterized by considerable clinical, pathological and molecular heterogeneity [1]. DLBCL accounts for a substantial proportion of aggressive lymphomas and approximately 40% of NHL worldwide. Although it may occur at any age, it is more frequently diagnosed in older adults, with the typical age of presentation reported in the mid-60s.

DLBCL is an aggressive lymphoma with a potentially curable clinical course when appropriately diagnosed and treated [2]. The introduction of immunochemotherapy, particularly rituximab-containing regimens, has significantly improved long-term disease control and survival. Nevertheless, a proportion of patients develop primary refractory disease or relapse after initial treatment [3]. Management of relapsed or refractory DLBCL remains challenging, particularly in settings where access to advanced diagnostic procedures, transplantation, cellular therapies and newer targeted treatments are limited.

In Nepal, information regarding the clinical characteristics and treatment outcomes of patients with DLBCL remains relatively limited treatment [4]. Local data are important because patient demographics, disease presentation, access to diagnostic facilities, treatment practices and socioeconomic factors may differ from those reported in high-income countries [5].

The present study was undertaken to describe the demographic and clinical characteristics, disease distribution, staging, treatment modalities and outcomes of adult patients with DLBCL treated at a tertiary care center in Nepal.

The objective of this study was to evaluate the clinical characteristics, treatment modalities and outcomes of patients diagnosed with DLBCL at our center.

Materials and Methods
Study design and setting
This was a retrospective cohort study conducted at Vayodha Hospital, Kathmandu, Nepal. The study was based on a review of medical records of adult patients diagnosed with DLBCL and treated at the institution.

Study population
Adult patients diagnosed with DLBCL between January 2018 and December 2023 were included. A total of 35 patients were enrolled. Patients were followed from the time of initial diagnosis through December 2025.

Data collection
Relevant information was retrospectively extracted from available clinical records. The variables available for analysis included age, sex, duration of symptoms, presence of B symptoms, nodal or extranodal presentation, extranodal anatomical sites, bulky disease, imaging modality used for staging and response assessment, disease stage, treatment regimen, relapse, mortality and follow-up status.

Diagnosis and Disease Classification
The diagnosis of NHL was established by histopathological examination of lymph node or extra nodal tissue biopsy specimens. Histological classification was based on the World Health Organization (WHO) classification of lymphoid neoplasms. Immunohistochemistry was performed for final diagnosis of DLBCL. Disease staging was performed according to the Ann Arbor staging system using contrast-enhanced computed tomography (CECT) 80% of patients, while PET-CT was used in 20% where financially feasible.

Treatment
Patients were treated using CHOP-based or rituximab-based regimens according to the treatment received during the study period and the clinical circumstances of individual patients. Eighteen patients (51%) received CHOP-based treatment, whereas seventeen patients (49%) received rituximab-based treatment.

Patients who experienced relapse were treated with a standard salvage regimen based on dexamethasone, high-dose cytarabine and cisplatin (DHAP). None of the relapsed patients underwent transplantation.

Outcome measures
The principal outcomes assessed were relapse, death due to refractory or progressive disease, survival status at the end of follow-up and duration of follow-up.

Statistical analysis
Descriptive statistics were used to summarize the demographic, clinical and treatment characteristics of the study population. Categorical variables were expressed as frequencies and percentages, while age and follow-up duration were summarized using mean and range. The available source data did not provide sufficient information to perform comparative statistical analyses or time-to-event survival analysis.

Ethical consideration
This study was based on retrospective review of clinical records. Information regarding institutional ethical approval, waiver of informed consent and ethics committee reference number was not included in the supplied study summary and should be added before journal submission, according to the requirements of the target journal.

Results

Demographic characteristics

A total of 35 adult patients with DLBCL diagnosed between January 2018 and December 2023 were included in the analysis. The mean age at diagnosis was 45 years, with a range of 21–76 years. There was a slight male predominance, with a male-to-female ratio of 1.18:1.

The largest age group was 40–60 years, comprising 16 patients (46%). Twenty-five patients (71%) had a symptom duration of 1–3 months at the time of evaluation.

Table 1: Demographic and clinical characteristics of patients with DLBCL.

Characteristic	Finding
Total patients	35
Mean age	45 years
Age range	21–76 years
Male: female ratio	1.18:1
Age 40–60 years	16 (46%)
Symptom duration 1–3 months	25 (71%)
B symptoms	5 (14%)
Nodal presentation	20 (57%)
Extranodal presentation	15 (43%)
Bulky disease	5 (14%)

Clinical Presentation

Nodal disease was more common than extranodal disease. Twenty patients (57%) presented with nodal involvement, whereas 15 patients (43%) had extranodal disease.

The extranodal sites documented in the study included the gastrointestinal tract, tonsil, thyroid, spine and testis. Bulky disease was identified in 14% of patients. The axilla and mediastinum were the common sites of bulky disease.

B symptoms were documented in 14% of patients.

Disease staging and Imaging

CECT was the principal imaging modality used for disease staging and response assessment, accounting for 80% of evaluations. PET-CT was used in 20% of patients.

Stage II disease represented the largest proportion of patients, accounting for 71% of the cohort. Approximately 23% of patients had advanced-stage disease.

Table 2: Disease distribution and staging.

Variable	Finding
Nodal disease	20 (57%)
Extranodal disease	15 (43%)
Bulky disease	5 (14%)
CECT for staging/response	28 (80%)
PET-CT for staging/response	7 (20%)
Stage II disease	25 (71%)
Advanced-stage disease	8 (23%)

Treatment pattern

CHOP-based treatment was administered to 18 patients (51%), while 17 patients (49%) received rituximab-based treatment.

Patients who relapsed received DHAP-based salvage treatment. None of the relapsed patients underwent transplantation.

Table 3: Treatment characteristics.

Treatment characteristic	Patients
CHOP-based regimen	18 (51%)
Rituximab-based treatment	17 (49%)
Relapsed patients treated with DHAP	11 (31%)
Transplantation among relapsed patients	None

Treatment outcome

During follow-up, 11 patients (31%) experienced relapse. Four patients (11%) died from refractory or progressive disease.

At the end of the reported follow-up, 31 patients (88%) were alive and under follow-up. The mean duration of follow-up from initial diagnosis was 72.3 months, with a range of 8–96 months.

Table 4: Treatment outcomes.

Outcome	Finding
Relapse	11 (31%)
Death from refractory/progressive disease	4 (11%)
Alive and followed up	31 (88%)
Mean follow-up duration	72.3 months
Follow-up range	8–96 months

Discussion

This retrospective cohort provides a clinical snapshot of DLBCL among adults treated at a tertiary care hospital in Nepal. The study included 35 patients diagnosed over a six-year period, with follow-up extending through December 2025. The principal findings were a relatively young mean age at presentation, a slight male predominance, predominance of nodal disease, frequent presentation with stage II disease, substantial use of CHOP-based treatment, and relapse in approximately one-third of patients [6].

The mean age at presentation in this cohort was 45 years, with patients ranging from 21 to 76 years. Nearly half of the patients were between 40 and 60 years of age. This represents a comparatively younger age profile than the age commonly reported for DLBCL in Western populations, where the disease is predominantly encountered among older adults [7]. The younger age distribution observed in this cohort may reflect differences in population demographics, referral patterns, access to healthcare or the relatively small sample size [8]. However, the present study alone cannot establish the reasons for this difference.

There was a slight male predominance, with a male-to-female ratio of 1.18:1 [9]. This finding is compatible with the generally recognized male predominance observed in many lymphoma cohorts. However, the relatively small sample size should be considered when interpreting this observation.

The duration of symptoms was relatively short in most patients. Seventy-one percent reported symptoms for 1–3 months before evaluation [10]. This may reflect the aggressive clinical behavior of DLBCL, where rapidly progressive lymphadenopathy or other disease manifestations can lead patients to seek medical evaluation [11]. At the same time, the study does not provide information regarding delays attributable to patient factors, referral pathways or access to diagnostic services.

Nodal disease was the predominant pattern of presentation, occurring in 57% of patients, while extranodal disease accounted for 43% [12]. The gastrointestinal tract, tonsil, thyroid, spine and testis were documented as extranodal sites. The relatively high proportion of extranodal presentation highlights the importance of considering DLBCL in patients presenting with masses or lesions outside conventional lymph-node stations [13].

B symptoms were documented in 14% of patients. Bulky disease was present in 14%, with the axilla and mediastinum reported as common sites. Because detailed laboratory parameters and prognostic scores were not available in the source dataset, the relationship between these clinical characteristics and treatment outcome could not be assessed [14].

An important finding was the predominance of CECT over PET-CT for staging and response assessment. CECT was used in 80% of patients, while PET-CT was available or used in only 20%. This difference may reflect resource and financial limitations. High cost and limited availability of PET-CT in Nepal restrict its routine use. Consequently, clinicians continue to rely primarily on CECT, which, although widely available, may underestimate disease burden and treatment response in some patients.

The original study specifically identifies financial restrictions as an important factor influencing the adoption of advanced investigations and treatment modalities [15].

Stage II disease accounted for 71% of the cohort, while 23% had advanced-stage disease. Disease staging plays a crucial role in determining prognosis and treatment strategy. Although early-stage presentation may reflect increasing awareness and improved referral pathways, a considerable proportion of patients still presented with advanced disease, likely due to delayed healthcare seeking, limited access to specialized oncology services, and financial barriers.

Treatment patterns demonstrate a transition toward immunochemotherapy, although conventional CHOP-based treatment remained common [16]. Eighteen patients (51%) received CHOP-based therapy, whereas 17 (49%) received rituximab-based treatment. The difference may reflect the availability and affordability of rituximab during the study period. The source study emphasizes financial restriction as a factor affecting treatment selection.

Relapse represented a major challenge in this cohort. Eleven patients, corresponding to 31%, experienced relapse. Relapsed patients received DHAP-based salvage treatment, but none underwent transplantation. This finding illustrates an important limitation in the management of relapsed DLBCL in resource-constrained settings. Although salvage chemotherapy can be used in appropriate patients, access to high-dose therapy and autologous stem-cell transplantation may influence the potential for durable disease control [17]. Relapse remains one of the major challenges in lymphoma management, particularly where access to salvage chemotherapy, autologous stem cell transplantation, CAR-T cell therapy, and novel targeted agents is limited [18-20]. In high-income countries, patients with relapsed or refractory NHL increasingly benefit from advanced therapeutic options, whereas such treatments remain largely inaccessible in Nepal because of financial and infrastructural limitations [18,19].

Four patients (11%) died from refractory or progressive disease, while 31 patients (88%) remained alive and were followed up. The mean follow-up duration was 72.3 months, ranging from 8 to 96 months. Although these findings provide useful descriptive information, the available data do not allow calculation of overall survival, progression-free survival, event-free survival or survival according to disease stage or treatment regimen. Future studies should prospectively collect these variables and use Kaplan–Meier and multivariable survival analyses.

The findings of this study have implications for lymphoma care in Nepal. Improvement in access to advanced imaging, comprehensive pathological and molecular characterization, affordable immunotherapy and standardized management of relapsed or refractory disease may contribute to improved outcomes. Establishment of institutional or national lymphoma registries could also provide more robust epidemiological and outcome data.

Limitations

This study has several limitations. First, it was a retrospective study based on medical records and therefore depended on the completeness and accuracy of existing documentation. Second, the sample size was relatively small, with only 35 patients. Third, the study was conducted at a single center, which limits generalizability to the broader Nepalese population.

Detailed pathological and molecular characteristics, genetic abnormalities, and other prognostic biomarkers, were not available in the supplied dataset. Similarly, laboratory prognostic parameters and International Prognostic Index scores were not discussed for risk characterization and treatment outcome separately which may be good scope for future study.

Finally, information regarding ethical approval and informed consent was not included in the supplied summary and should be incorporated into the final submission after verification.

Conclusion

DLBCL in this Nepalese cohort commonly presented during the fifth decade of life, with a slight male predominance and nodal disease as the most frequent presentation. Stage II disease constituted the largest reported group. Both CHOP-based and rituximab-based treatment were used, while approximately one-third of patients experienced relapse.

The findings suggest that financial limitations may influence access to advanced diagnostic investigations and treatment modalities. Management of relapsed DLBCL remains particularly challenging, as reflected by the use of salvage chemotherapy without transplantation in the relapsed patients.

Larger multicenter prospective studies are needed in Nepal to characterize the pathological and molecular profile of DLBCL, determine prognostic factors, evaluate treatment response and survival outcome in large cohort.

Acknowledgements

The authors may acknowledge the Department of Hematology and Medical Oncology, Department of Pathology, Vayodha Hospital, and other individuals or institutions who contributed to the study.

References

1. Berhan A, Almaw A, Damtie S, et al. Diffuse large B cell lymphoma DLBCL epidemiology pathophysiology risk stratification, advancement in diagnostic approaches and prospects narrative review. Discov oncol. 2025; 16: 184.
2. Shi Y, Xu Y, Shen H, et al. Advances in biology diagnosis and treatment of DLBCL. Ann Hematol. 2024; 103: 3315-3334.
3. Feugier P. A review of rituximab, the first anti-CD20 monoclonal antibody used in the treatment of B non-Hodgkin's lymphomas. Future oncol. 2015; 11: 1327-1342.
4. Epperla N, Kumar A, Abutalib SA, et al. ASTCT clinical practice recommendations for transplantation and cellular therapies in diffuse large B cell lymphoma. Transplant Cell Ther. 2023; 29: 548-555.
5. De Souza JA, Hunt B, Asirwa FC, et al. Global health equity cancer care outcome disparities in high middle and low-income countries. J Clin Oncol. 2016; 34: 6-13.
6. Vassilakopoulos TP, Michail M, Papageorgiou S, et al. Identification of very low-risk subgroups of patients with primary mediastinal large B-cell lymphoma treated with R-CHOP. Oncologist. 2021; 26: 597-609.
7. Chiappella A, Castellino A, Nicolosi M, et al. Diffuse large B-cell lymphoma in the elderly: standard treatment and new perspectives. Expert Rev Hematol. 2017; 10: 289-297.
8. Mullin DS, Stirland LE, Buchanan E, et al. Identifying dementia using medical data linkage in a longitudinal cohort study Lothian Birth Cohort 1936. BMC psychiatry. 2023; 23: 303.
9. Simons K, Bradfield O, Spittal MJ, et al. Age and gender patterns in health service utilisation Age-Period-Cohort modelling of linked health service usage records. BMC Health Serv Res. 2023; 23: 480.
10. Atlas SJ, Deyo RA, Keller RB, et al. The Maine Lumbar Spine Study Part II 1-year outcomes of surgical and nonsurgical management of sciatica. Spine. 1996; 21: 1777-1786.
11. Roschewski M, Phelan JD, Jaffe ES. Primary large B-cell lymphomas of immune-privileged sites. Blood. 2024; 144: 2593-2603.
12. Møller MB, Pedersen NT, Christensen BE. Diffuse large B-cell lymphoma clinical implications of extranodal versus nodal presentation–a population-based study of 1575 cases. Br J Haematol. 2024; 124: 151-159.
13. Chen SY, Ji MM, Xu PP, et al. Primary extranodal diffuse large B-cell lymphoma Molecular features treatment and prognosis. Aging and Cancer. 2022; 3: 133-146.
14. Sharma A, Fidias P, Hayman LA, et al. Patterns of lymphadenopathy in thoracic malignancies. Radiographics. 2004; 24: 419-434.
15. Kumar P, Damle NA, Bal C. Role of F18-FDG PET/CT in the staging and restaging of esophageal cancer a comparison with CECT. Indian J Surg Oncol. 2011; 2: 343-350.
16. Skafi M, Caserta S, Vigna E, et al. Frontline therapy in diffuse large B-cell lymphoma evolving standards biological insights and future directions. Eur J Haematol. 2026; 116: 522-534.
17. Tonino SH, van Gelder M, Eldering E, et al. R-DHAP is effective in fludarabine-refractory chronic lymphocytic leukemia. Leukemia. 2010; 24: 652-654.
18. Crump M, Neelapu SS, Farooq U, et al. Outcomes in refractory diffuse large B-cell lymphoma. Blood. 2017; 130: 1800-1808.
19. Sarkozy C, Sehn LH. Management of relapsed/refractory diffuse large B-cell lymphoma. Hematology Am Soc Hematol Educ Program. 2018; 2018: 209-216.
20. Philip T, Guglielmi C, Hagenbeek A, et al. Autologous bone marrow transplantation as compared with salvage chemotherapy in relapses of chemotherapy-sensitive NHL. N Engl J Med. 1995; 333: 1540-1545.

© 2026 Ajaya Kumar Jha, et al. This article is distributed under the terms of the Creative Commons Attribution 4.0 International License