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Relapsed Lymphoma Treatment and Outcome: A Real Challenge in a Resource-Poor Country

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Abstract

Despite favorable outcome of Hodgkin lymphoma approximately 25% of patient's experience relapse or refractory to initial treatment. Non-Hodgkin Lymphoma is clinically and biologically a diverse group of disease ranging from indolent to aggressive clinical course. Diffuse large B cell variant is clinically aggressive course while follicular, Marginal zone lymphoma are indolent. Response rate to conventional chemotherapy is more than fifty percent however in significant proportion do relapse. Several factors are considered for adopting salvage regimen including autologous bone marrow transplant. Novel emerging treatment are also under current practice. A retrospective clinic -pathological profile and treatment outcome of relapsed lymphoma cases at Vayodha Hospital from January 2022 to February 2026. Retrospective chart review of patients diagnosed as relapsed lymphoma and got treated were enrolled in the study over 50 months' period. Total of 20 adult patients were enrolled in the study. Biopsy was done in all cases and disease classification was done according to histomorphology and immunohistochemistry. Staging was done by PET CT/CECT. From January 2022 to February 2026, twenty cases were registered with relapsed lymphoma. Mean age of presentation was 42.5 years (range 21-72 years). Male: female ratio was 2.3:1. During this period four patients with Hodgkin lymphoma and sixteen patients with Non-Hodgkin Lymphoma relapsed. Biopsy was done in all and further subtyping was done on the basis of histomorphology and immunohistochemistry. Staging and response evaluation of treatment was done by PET CT in 55% while contrast enhanced CT was done in 45%. All Hodgkin lymphoma were treated with ABVD regimen prior to relapse while Non-Hodgkin lymphoma was treated with Rituximab based regimen in majority 75%. Median time to relapse was 36 months. Majority (80%) was documented as late relapse and nodal disease in 55%. Extra nodal were 45% and sites were Brain & spine (25%), orbit, bone marrow, gastrointestinal tract, nasopharynx and spleen. Diffuse large B cell histology was found in 56%. Mantle cell (19%), T cell rich B cell (12.5%), Follicular and MALT lymphoma each 6% are other histological types. Chemotherapy based salvage regimen was used in 80% and autologous bone marrow transplant after salvage was opted in 10% and remaining 10% was treated with only palliative care. DHAP (Dexamethasone, Ara-C, Cisplatin) regimen was used in 45%. Outcome analysis revealed 70% alive and deaths were recorded in 30% due to progressive and refracto-

ry disease. Mean duration of follow up since first diagnosis was 64.5 months (range: 8 - 96 months). Relapse poses significant challenges in resource poor country. Limited diagnostic facilities and poor patient finance poses difficulty in planning treatment strategy. Standard salvage followed by bone marrow transplant is limited due financial constraint and limited facility as well.

Keywords: Lymphoma; Bone marrow transplant; Non-Hodgkin lymphoma and Nepal

Introduction

Lymphoma is a heterogeneous group of hematological malignancies broadly classified into Hodgkin lymphoma (HL) and Non-Hodgkin lymphoma (NHL) [1-2]. Although advances in chemotherapy, immunotherapy, and hematopoietic stem cell transplantation have significantly improved survival, disease relapse remains a major cause of treatment failure and mortality [3]. Approximately 20-40% of patients with aggressive NHL and 10-20% of patients with HL experience relapse or refractory disease after first-line treatment, necessitating salvage chemotherapy and, where feasible, autologous stem cell transplantation [4, 5]. Early diagnosis and timely management of relapsed lymphoma are essential to improve long-term survival.

In low- and middle-income countries such as Nepal, the management of relapsed lymphoma is challenging because of limited access to advanced diagnostic facilities, positron emission tomography-computed tomography (PET-CT), stem cell transplantation, novel targeted therapies, and financial resources [6, 7]. Consequently, treatment decisions are often influenced by resource availability, leading to variations in clinical practice and patient outcomes. Despite the increasing burden of lymphoma, published data on the clinicopathological characteristics, treatment patterns, and outcomes of relapsed lymphoma in Nepal remain limited.

This study aimed to describe the demographic and clinical characteristics, histopathological subtypes, treatment modalities, and clinical outcomes of patients with relapsed lymphoma managed at a tertiary care hospital in Kathmandu, Nepal. The findings are expected to provide local evidence to support clinical decision-making and improve lymphoma management in resource-limited settings [8].

Materials and Methods

A retrospective observational study was conducted at the Department of Hematology/Medical Oncology, Vayodha Hospital, Kathmandu, Nepal, including patients diagnosed with relapsed lymphoma between January 2022 and February 2026. Adult patients (≥18 years) with histologically confirmed Hodgkin lymphoma or Non-Hodgkin lymphoma who experienced disease relapse after achieving complete remission following first-line treatment were included. Patients with incomplete medical records or refractory disease without documented remission were excluded.

Demographic, clinical, pathological, treatment, and outcome data were retrieved from hospital medical records using a standardized data collection form. Histopathological diagnosis was confirmed by lymph node biopsy and immunohistochemistry, while disease staging at relapse was performed using the Lugano Classification based on positron emission tomography-computed tomography (PET-CT) or contrast-enhanced computed tomography, where available. Descriptive statistical analysis was performed using the IBM SPSS Statistics version 26.0. Continuous variables were summarized as mean ± standard deviation or median (interquartile range), and categorical variables were expressed as frequencies and percentages. As this retrospective study used anonymized hospital records, the requirement for individual informed consent was waived in accordance with institutional policy.

Results

A total of 20 patients with relapsed lymphoma were included in the study. The mean age of the patients was 42.5 years (range: 21-72 years), with a male predominance (male: female ratio, 2.3:1). Non-Hodgkin lymphoma (NHL) accounted for 16 (80.0%) cases, while Hodgkin lymphoma (HL) comprised 4 (20.0%) cases. Diffuse large B-cell lymphoma (DLBCL) was the most common histological sub-

type among NHL cases. The baseline demographic and clinical characteristics of the study participants are presented in Table 1. The median time to relapse following completion of first-line treatment was 36 months. Most patients (80.0%) experienced late relapse, whereas 20.0% had early relapse. Extra nodal involvement at relapse was observed in 45.0% of patients, with lymph nodes remaining the most frequent site of disease involvement. The distribution of lymphoma subtypes, disease stage, and relapse characteristics is summarized in Table 2.

Salvage chemotherapy was administered to 16 (80.0%) patients, with the DHAP regimen being the most frequently used protocol. Two patients (10.0%) subsequently underwent autologous stem cell transplantation, while the remaining two patients (10.0%) received palliative or supportive care because of advanced disease, poor performance status, or financial constraints. Treatment modalities are presented in Table 3.

At the last follow-up, 14 (70.0%) patients were alive, whereas six (30.0%) had died because of progressive disease. Patients who received salvage chemotherapy followed by autologous stem cell transplantation demonstrated better clinical outcomes than those managed with chemotherapy alone, although formal comparative statistical analysis was limited by the small sample size. Overall treatment outcomes are summarized in Table 4.

Variable	***n (%)***
Age, years	
Mean ± SD	42.5 ± 15.4
Range	21–72
Sex	
Male	14 (70.0)
Female	6 (30.0)
Male: Female ratio	2.3:1
Lymphoma type	
Hodgkin lymphoma	4 (20.0)
Non-Hodgkin lymphoma	16 (80.0)
Most common NHL subtype	
Diffuse large B-cell lymphoma (DLBCL)	9 (56.3*)
Other NHL subtypes	7 (43.7*)
**Percentage calculated among NHL cases (n = 16).*	

Table 1: Baseline demographic and clinical characteristics of patients with relapsed lymphoma (N = 20).

Variable	***n (%)***
Median time to relapse	36 months
Early relapse (<12 months)	4 (20.0)
Late relapse (≥12 months)	16 (80.0)
Extra nodal involvement	9 (45.0)
Nodal disease only	11 (55.0)
Histopathological confirmation	20 (100.0)
Staging performed using PET-CT/CT	20 (100.0)

Table 2: Disease characteristics at relapse.

Treatment modality	*n (%)*
Salvage chemotherapy	16 (80.0)
DHAP regimen	10 (50.0)
Other salvage regimens*	6 (30.0)
Autologous stem cell transplantation	2 (10.0)
Palliative/supportive care	2 (10.0)
**Includes ICE, GDP, ESHAP, or other salvage chemotherapy regimens according to clinician discretion.*	

Table 3: Treatment modalities for relapsed lymphoma.

Outcome	*n (%)*
Alive at last follow-up	14 (70.0)
Death due to progressive disease	6 (30.0)
Overall survival at last follow-up	70.0%
Patients receiving transplantation	2 (10.0)
Patients managed without transplantation	18 (90.0)

Table 4: Clinical outcomes of patients with relapsed lymphoma.

Discussion

This retrospective study provides one of the few institutional reports describing the clinicopathological characteristics, treatment patterns, and clinical outcomes of patients with relapsed lymphoma in Nepal. The findings demonstrate that Non-Hodgkin lymphoma (NHL), particularly Diffuse Large B-cell Lymphoma (DLBCL), was the predominant subtype among relapsed cases, with most patients experiencing late relapse and receiving salvage chemotherapy as the principal treatment modality. Although the majority of patients remained alive at the last follow-up, access to autologous stem cell transplantation (ASCT) and novel therapies was limited, highlighting the challenges of managing relapsed lymphoma in resource-constrained settings.

The predominance of NHL (80%) observed in this study is consistent with global epidemiological data, where NHL accounts for approximately 85-90% of all lymphoma cases [9]. Among NHL subtypes, DLBCL remains the most common aggressive lymphoma worldwide and represents the largest proportion of relapsed disease requiring second-line treatment [10]. Previous international studies have similarly reported that approximately one-third of patients with DLBCL experience relapse or refractory disease despite achieving an initial response to standard immunochemotherapy.

The relatively young mean age of 42.5 years observed in the present study differs from reports from Europe and North America, where the median age at diagnosis of DLBCL is generally between 60 and 70 years. This younger age distribution has also been described in several South Asian countries and may reflect differences in population demographics, genetic susceptibility, environmental exposures, healthcare-seeking behavior, and referral patterns [11]. Younger patients are generally expected to tolerate intensive salvage chemotherapy better and are more likely to be considered candidates for high-dose chemotherapy followed by ASCT. However, socioeconomic barriers and limited transplantation facilities frequently restrict access to these potentially curative treatments in low-resource settings.

An important finding of this study is that most patients experienced late relapse, with a median relapse interval of 36 months. Late relapse is generally associated with a more favorable prognosis than early relapse or primary refractory disease because these patients are more likely to retain chemo sensitive disease and respond to salvage chemotherapy [12]. International studies have consistently demonstrated superior survival among patients with late relapse compared with those who relapse within the first year after completion of primary treatment. The predominance of late relapse in our cohort may partially explain the encouraging overall

survival observed during follow-up despite limited access to advanced therapeutic options.

Salvage chemotherapy represented the cornerstone of treatment in the present study, with the DHAP regimen being the most commonly administered protocol. This finding is consistent with international recommendations, which consider platinum-based salvage chemotherapy regimens such as DHAP, ICE, GDP, and ESHAP as acceptable options for patients with relapsed aggressive lymphoma who are eligible for subsequent ASCT [13]. Current evidence suggests that no single salvage regimen has demonstrated clear superiority over others; rather, treatment selection depends on previous therapy, toxicity profile, physician experience, drug availability, and patient fitness.

Despite the widespread use of salvage chemotherapy, only a small proportion of patients in this study underwent ASCT. This observation reflects the reality of lymphoma management in many low- and middle-income countries, where transplantation services remain limited because of financial constraints, inadequate infrastructure, donor availability, and restricted access to specialized hematology centers. International guidelines recommend ASCT as the standard consolidation strategy for patients with chemo sensitive relapsed lymphoma because it provides durable disease control and improved long-term survival [14]. However, successful implementation of this approach depends not only on disease biology but also on the availability of specialized healthcare resources [15].

Limitations

The retrospective design and small sample size limit the generalizability of the findings. Survival outcomes and prognostic factors could not be analyzed due to incomplete follow-up data.

Conclusion

Relapsed lymphoma remains a significant therapeutic challenge in Nepal, particularly in resource-limited healthcare settings where access to advanced diagnostics, novel therapies, and autologous stem cell transplantation is limited. In this study, Non-Hodgkin lymphoma, especially Diffuse Large B-cell Lymphoma, was the predominant subtype among relapsed cases. Most patients experienced late relapse and were managed with salvage chemotherapy, while only a small proportion underwent stem cell transplantation because of financial and infrastructural constraints. Despite these limitations, encouraging survival outcomes were observed among patients who received appropriate salvage treatment. Strengthening early diagnosis, standardized treatment protocols, multidisciplinary care, and timely referral for transplantation could further improve patient outcomes. Expansion of transplantation services, improved access to newer targeted therapies, and increased financial support for cancer care are essential to optimize lymphoma management in Nepal. Larger multicenter prospective studies are warranted to validate these findings and provide evidence for national treatment guidelines and health policy development.

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Conflict of Interest

The author declares no conflict of interest.

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