Real-World Outcomes of Diffuse Large B-Cell Lymphoma: A 7-Year Retrospective Cohort Study from a Tertiary Care Center in a Low- and Middle-Income Country

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INTRODUCTION

Diffuse large B-cell lymphoma (DLBCL) is the most common non-Hodgkin lymphoma (NHL) subtype, comprising 30–40% of all NHL cases worldwide[2,3]. In Pakistan, NHL ranks as the 7th most common malignancy, accounting for 3.9% of new cancer diagnoses[1]; a Pakistani cross-sectional study similarly reported DLBCL as the most common lymphoma subtype, comprising 69% of NHL cases[27]. DLBCL carries a reported 5-year survival of 60–70%[5], and 30–40% of patients become refractory to or relapse after treatment. Diagnosing and managing DLBCL in a resource-limited setting such as Pakistan poses unique challenges, including limited infrastructure, diagnostic access, and high treatment costs, that may adversely affect outcomes in this otherwise potentially curable disease[10].

AIM

To report the presentation, treatment patterns, and outcomes, including response rates, progression-free survival (PFS), and overall survival (OS), of adult patients with DLBCL treated over a 7-year period at a single tertiary cancer center in a low- and middle-income country, and to identify variables influencing these outcomes.

METHOD

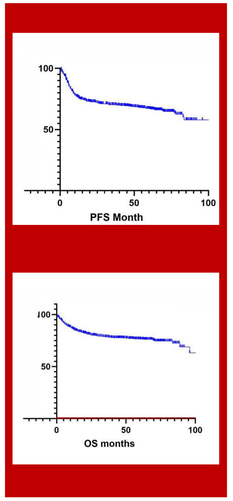
- Retrospective cohort study at Shaukat Khanum Memorial Cancer Hospital & Research Centre, Lahore, Pakistan (Jan 2015–Dec 2021)
- Adults (≥18y) with confirmed DLBCL; excluded low-grade, transformed high-grade, primary mediastinal B-cell, and Burkitt lymphoma
- Response assessed per Lugano classification (CR / PR / SD / PD)[26]
- First-line therapy: CHOP-based chemotherapy ± rituximab (R-CHOP); DA-EPOCH-R for double-hit lymphoma
- Salvage therapy: ICE or GDP ± rituximab, followed by ASCT if eligible
- PFS and OS estimated by Kaplan–Meier method; multivariable Cox regression for independent prognostic factors

CONCLUSIONS

Our cohort represents a relatively young population (median age 34 years) with a high burden of advanced-stage disease at presentation. Despite resource limitations, survival outcomes (5-year OS 76.4%, 5-year PFS 67.2%) were comparable to international literature. Rituximab exposure and non-bulky disease were independently associated with improved survival on multivariable analysis, underscoring the importance of expanding access to standard therapies in low-resource settings.

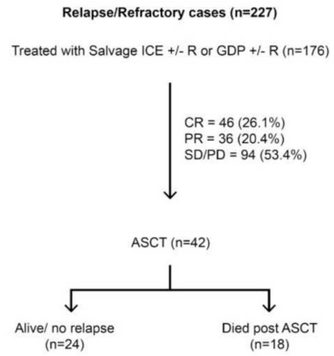
Results

- 964 patients treated 2015–2021; median age 34 years (range 18–82); M:F ratio 2.1:1
- Advanced-stage (Ann Arbor III–IV) disease in 55.6%; early-stage in 33.9%
- 76.1% received rituximab as part of first-line chemotherapy
- End-of-treatment response: CR 68.5%, PR 7.7%, PD 10.9%
- 23.5% of patients relapsed or were primary refractory; 176 received salvage chemotherapy (ORR 46.6%)
- 42 patients (18.5% of relapsed/refractory cohort) proceeded to ASCT
- 5-year OS was 62% after ASCT vs. 26% with salvage chemotherapy alone
- Median follow-up 50 months; 5-year PFS 67.2%, 5-year OS 76.4%
- On multivariable analysis, rituximab exposure was independently associated with improved OS (HR 0.61, 95% CI 0.44–0.87, p=0.005) and PFS (HR 0.63, 95% CI 0.47–0.84, p=0.002); bulky disease was independently associated with worse OS and PFS

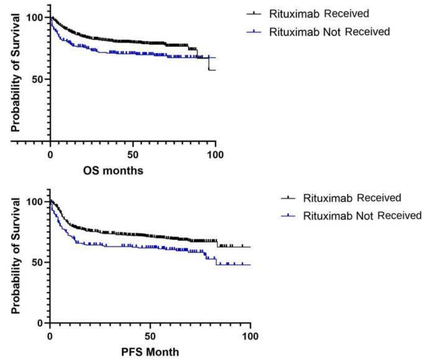


Kaplan–Meier curves for progression-free survival (PFS, top) and overall survival (OS, bottom) from initiation of first-line chemotherapy in the overall cohort (n=964). 5-year PFS 67.2%; 5-year OS 76.4%.

Characteristic	n (%)	Characteristic	n (%)
Median age	34 y (range 18–82)	IPI 0–2 (low/low-int) vs ≥3	626 (64.9%) / 316 (32.8%)
Male sex	654 (67.8%)	Bulky disease (>7.5 cm)	427 (44.3%)
Advanced stage (III–IV)	536 (55.6%)	Nodal vs extranodal disease	580 (60.2%) / 384 (39.8%)
Early stage (I–II)	327 (33.9%)	B symptoms present	509 (52.8%)
Rituximab exposure	733 (76.1%)	Complete response	660 (68.5%)
Primary refractory	127 (13.2%)	ORR to salvage therapy	82/176 (46.6%)
Relapsed disease	100 (10.4%)	Proceeded to ASCT	42 (18.5% of R/R)
5-year PFS (overall)	67.2%	5-year OS (overall)	76.4%
5-year OS post-ASCT	62%	5-year OS, salvage only	26%



Flow of relapsed/refractory patients through salvage chemotherapy and ASCT.



Overall survival (A) and progression-free survival (B) with vs. without rituximab exposure.

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