Clinical Characteristics, Treatment Patterns, and Healthcare Costs of Diffuse Large B-Cell Lymphoma in Colombia: A Real-World Evidence Study

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Background

Diffuse large B-cell lymphoma (DLBCL) is an **aggressive hematologic** malignancy with an estimated 150,000 new cases annually, worldwide[1,2]. Although rituximab-based regimens are established as the standard of care and have significantly improved survival, a proportion of patients still develop **relapse or refractory (R/R) disease**[3,4]. These patients often require specialized diagnostic testing, advanced imaging, and novel therapeutic strategies to improve outcomes. Evidence from high-income countries indicates that R/R DLBCL is a major driver of healthcare resource use with a **significant economic burden**[5-13]. However, real-world evidence on DLBCL in Latin America, particularly in Colombia, remains scarce.

Objective

To describe the clinical characteristics of patients with DLBCL treated at a reference cancer center in Colombia and to assess the relationship between clinical variables and direct healthcare costs.

Methods

A retrospective observational study based on secondary data use was conducted between July 2022 and September 2025 at the Luis Carlos Sarmiento Angulo Cancer Treatment and Research Center (CTIC) in Bogotá, Colombia

Population

- Patients aged ≥18 years with a diagnosis of histopathologically confirmed DLBCL.

Data sources

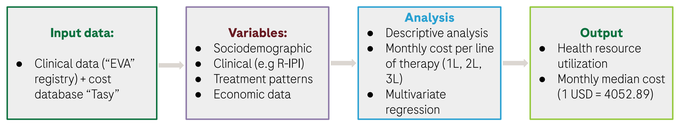
- Patient-level data from the CTIC's institutional registry "EVA" were linked to an administrative claims database (Tasy).
- EVA is an ongoing clinical registry that captures real-world data from routine clinical practice at CTIC.

Variables

- Sociodemographic and clinical variables included sex, age, disease history, prognostic scores (International Prognostic Index [IPI], Revised International Prognostic Index [R-IPI] and International Prognostic Index for the Central Nervous System [CNS-IPI]), clinical staging (Ann Arbor and Lugano classifications), and performance status (Eastern Cooperative Oncology Group [ECOG]). Treatment patterns across lines were also assessed.
- Treatment response was assessed using PET/CT scans after 2-3 cycles (intermediate assessment) or after 4-6 cycles (final assessment).
- Healthcare resource use included dates of service, procedures, and administered treatments, while costs were based on recorded healthcare cost.

Statistical analysis

- Descriptive analyses were conducted for sociodemographic, clinical variables, and treatment patterns. Healthcare utilization was assessed by estimating monthly median costs by line of therapy (first-, second-, and third-line) and service category.
- Costs are presented in US dollars (USD), using a conversion rate of 1 USD = 4,052.89 COP.
- Multivariate linear regression models were used to evaluate the relationship between prognostic clinical variables (R-IPI and treatment response) and healthcare resource use, adjusting for sex, healthcare insurance regimen, and comorbidities.
- Statistical analyses were performed using R Studio®.



Results

Sixty-nine patients were included (median age: 68 years; Q1-Q3: 56-76), and 55% were males. According to the Hans algorithm classification, 71% were classified as germinal center B-Cell (GCB) subtype and 29% were non-germinal center (non-GCB). Most patients presented with advanced-stage disease **(Table 1)**. Most patients had a good performance status **(Figure 1)**, despite presenting with advanced-stage disease (Figure1). Extranodal involvement was observed in 67% of patients, most commonly affecting the gastrointestinal tract (30.0%) **(Figure 2)**.

Figure 1. ECOG performance

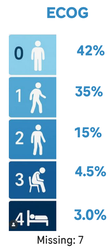


Figure 2. Extranodal involvement

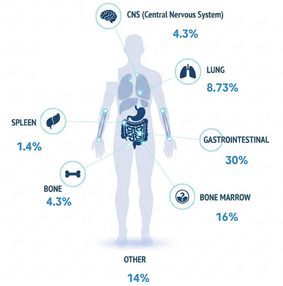


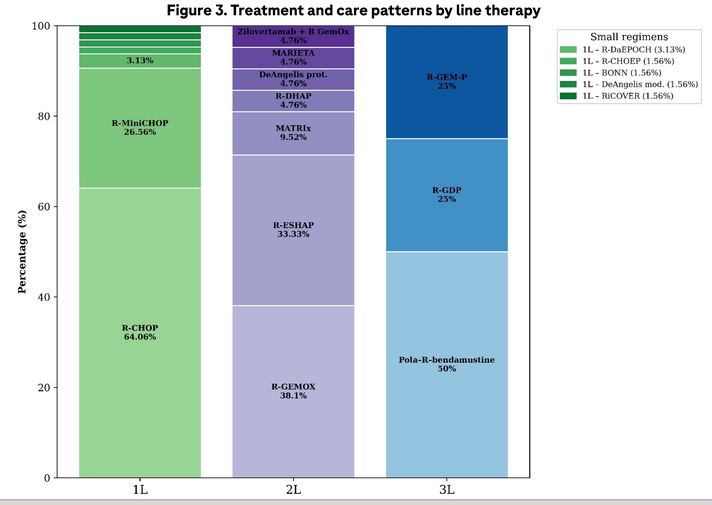
Table 1. Clinical characteristics

Ann Arbor classification	
I	13%
II	7.8%
IIB	3.1%
III	7.8%
IIIB	7.8%
IV	42%
IVB	19%
Lugano classification	
I	13%
II	10%
III	17%
IV	55%
Unknown	4.3%
IPI	
Low risk (0 to 1 points)	12%
Low-intermediate risk (2 points)	31%
High-intermediate risk (3 points)	34%
High risk (4 to 5 points)	24%
R-IPI	
Very good (0 points)	5.1%
Good (1 to 2 points)	37%
Poor (3 to 5 points)	58%
CNS-IPI	
Low risk (0 to 1 point)	12%
Intermediate risk (2 to 3 points)	64%
High risk (4 to 5 points)	24%

Treatment patterns

- Five patients were censored due to treatment initiation at another institution. Nevertheless, these patients received subsequent lines of therapy at CTIC and were included in the analysis.
- R-CHOP was the most frequently administered regimen in first-line (1L), while R-platinum-based regimens were most commonly used in the relapse/refractory (R/R) setting **(Figure 3)**.
- The duration of each treatment line, defined as the time from first to last administration, had a median of 107 days (Q1–Q3: 78.5–114) in 1L, 61 days (Q1–Q3: 25.5–70.8) in 2L, and 102 days (Q1–Q3: 83.7–129) in 3L.
- After 1L, nine patients (14%) experienced clinical relapse, 12 (18.7%) had refractory disease and 12 (18.7%) died before clinical assessment by PET/CT scan.

Figure 3. Treatment and care patterns by line therapy



Healthcare Resource Utilization (HCRU) and costs

Direct costs were primarily driven by **medications, supplies and hospitalizations**. While total accumulated cost decreased as patients progressed through subsequent lines due to cohort attrition, per-patient resource use increased significantly. After adjusting for individual follow-up time, the monthly median cost in the **2L (USD 7,147.7)** and **3L (USD 5,953.6)** settings was approximately **threefold higher than in 1L (USD 2,006.7) (Table 2).**

Multivariate regression models in 1L showed that patients who died or were censored before final PET/CT assessment incurred in **7.2-fold higher costs** compared with those achieving complete response (CR), corresponding to an additional monthly cost of **USD 28,330.8** ($p < 0.05$). This difference was likely related to the fact that most of these patients presented with advanced-stage disease. Furthermore, patients with refractory disease on final PET/CT scan had **7.6-fold higher cost** and incurred an additional monthly cost of **USD 11,582.3** compared with patients with CR; however, this difference was not statistically significant ($p = 0.2$) **(Table 2).**

Table 2. Multivariable regression model assessing the association between PET/CT scan final response and direct healthcare cost in first-line therapy

Variable	Relative cost (vs reference)	CI 95%	Monthly Cost Increase (USD)	95% confidence interval
Final PET/CT (Reference: Complete response)				
Death or censored	7.2	2.8 to 18.3	28,330.8	14,648.1 to 42,013.5
Partial response	1.5	0.4 to 5.8	2,962.5	-16,374.6 to 22,299.6
Progressive disease	2.8	1.1 to 6.9	2,505.4	-10,693 to 15,703.7
Refractory disease	7.6	2.6 to 22.7	11,582.3	-4,394.6 to 27,559.3

R-IPI, as an additional prognostic variable, suggests that patients in the Good and Very Good categories had lower costs compared with the Poor category (0.6 and 0.2 times, respectively). However, these differences did not reach statistical significance ($p > 0.05$). Similarly, among control variables, 3L treatment was associated with 2.3-fold higher direct costs compared with 1L, although this difference was not statistically significant. In both analyses, the number of patients was limited, particularly in advanced treatment lines, and may have been further affected by missing data, potentially influencing statistical significance.

Key points

- Most patients presented with advanced-stage disease and extranodal involvement.
- Rituximab-based regimens were the most frequently used in 1L and 2L; however, approximately 30% of patients experienced disease progression across these lines.
- Across all lines of therapy, the primary drivers of healthcare resource utilization and direct medical costs were pharmacological treatments, medical supplies, and hospitalizations.
- In 1L, patients who died or were censored before PET/CT assessment incurred a 7-fold increase in monthly direct costs compared with those achieving complete response (CR). .

Conclusions

Our study shows that, despite current treatment strategies, at least a third of patients with DLBCL experience suboptimal response and disease progression, highlighting a persistent unmet clinical need. R/R disease and inadequate response to initial therapy are associated with substantially higher costs in subsequent lines, reflecting the growing economic burden of progression. These findings underscore the importance of improving disease control early in the treatment pathway to reduce progression and mitigate the costs associated with advanced disease.

References