

Epidemiology and overall survival of patients with diffuse large B-cell lymphoma in the O'Higgins region, Chile

Abstract

Diffuse large B-cell lymphoma (DLBCL) is the most common subtype of non-Hodgkin lymphomas. Although overall survival has improved since introducing rituximab to the CHOP regimen, some socio demographic factors may affect the outcome. Because there are no descriptive data on patients treated in the O'Higgins region (Chile), which is characterized by being a mainly rural area, we consider how to describe the characteristics and survival of patients with DLBCL in the region. We conducted a retrospective study that included 106 patients and investigated the clinical and pathological features of the clinical records. We performed a subgroup analysis considering the stage, B symptoms, histological type, and status of BCL2, BCL6, and MYC. The baseline characteristics of the subgroups were compared using chi-square and Student's t-test. Survival analysis was performed using Kaplan Meier curves and compared by log-rank test. The results highlight that the probability of overall survival at 36 months was 67.7%, but differences were evidenced according to the stage (early-stage 90.5% and late-stage 71.8%); no differences were found in survival according to categorical age, B symptoms, cell origin and status of BCL2, BCL6, MYC. It is essential to develop association studies to determine factors that may affect the survival of patients residing in the region.

Keywords: diffuse large b-cell lymphoma, O'Higgins region, chile, survival

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Introduction

Diffuse large B-cell lymphoma (DLCL) is the most common subtype of all non-Hodgkin lymphomas, representing 30-40% of the total in Chile and the world.^{1,2} Since 2007, with the inclusion of rituximab to CHOP therapy (cyclophosphamide, doxorubicin, vincristine, and prednisone), there was a significant improvement in overall survival and progression-free survival at five years of up to 50-80%; however, the stage at diagnosis is an important prognostic factor.³ The O'Higgins region is located in the central macrozone of Chile, and approximately 65% is considered rural, with 53% of the population in non-urban territories.⁴ According to data from the United States of America, there is a difference in mortality between patients residing in different geographical areas, with those residing in non-urban areas having a higher risk.^{5,6} For these reasons, there is a need to describe the characteristics and survival of patients with DLBCL in the O'Higgins region.

Patients and methods

We conducted a retrospective study of incident cases of DLBCL treated at the Hematology Service of the Hospital Regional Libertador Bernardo O'Higgins (HRLBO) from 2017 to 2022. The information of the participants was obtained from the clinical registry, and the age at diagnosis, gender, symptomatology, and clinical stage according to the Ann Arbor classification was investigated, considering stages I and II an early disease and stages III and IV late. The subjects included in the research had a diagnosis confirmed by immunohistochemistry of DLBCL, and following the Hanns algorithm, the origin of the cell (germinal center B-cell like) was determined. We evaluated overall survival, defined as the time in months between histological diagnosis and the presentation of the death event or the date of the last information. We performed a subgroup analysis considering the stage, B symptoms, histological type (germinal center or non-germinal center), and according to the markers BCL2, BCL6, and MYC.

Patient data were analyzed using SPSS version 27. The continuous variables' mean and the categorical variables' percentages were determined. The baseline characteristics of the subgroups were compared using chi-square and Student's t-test. Survival analysis was performed using Kaplan Meier curves and compared by log-rank test. P-Value <0.05 was considered significant.

Results

A total of 106 patients, with a mean age of 64.42 years (standard deviation 13.7), were included in the study. The frequency of stages I, II, III, and IV at diagnosis was 22.4%, 26.3%, 21.1%, and 30.2%, respectively; however, this information was available in 76 patients. Table 1 describes the baseline characteristics of patients and tumor lesions.

When analyzing the characteristics by subgroups, it was evident that age was similar in the subjects in the early stage (64.8 years, SD 12.5) and late stage (61.9 years, SD 15.0). In addition, it was observed that in both groups, the frequency distribution of the variables categorical age, gender, the origin of tumor cells, LDH, blood count, BCL2, BCL6, and MYC status was similar (Table 2). As shown in Table 2, patients with late stages had a higher frequency of B symptoms (82.9%) compared to patients with early stages (48.6%) ($p=0.003$). The probability of overall survival at 36 months was 67.7%, while the survival of early and late-stage patients was 90.5% and 71.8% (Log Rank 0.025) (Figure 1). No differences were found in survival according to categorical age, B symptoms, cell origin, and BCL2, BCL6, and MYC status.

Discussion

The present study shows some characteristics of patients with DLBCL treated at the HRLBO, located in the city of Rancagua in the O'Higgins Region. The importance of the characterization of

our patients is due to the particularities of the region concerning the other regions of Chile for the following reasons: 1) The geographical location of the hospital requires that patients in the region must travel for medical care because it is the only public hospital in the region with a Hematology Service, 2) A significant proportion of the population resides in non-urban areas, and 3) There is considerable agricultural activity in the region. Several studies have determined that residing far from the specialized health center and in non-urban areas is associated with higher cancer mortality.⁷ According to the findings of the present study, more than half of the patients are diagnosed in the late stages; however, these results are consistent with those reported by Cabrera et al.⁸ for several regions of Chile; in this study, there is an essential regional heterogeneity, but the more significant contribution of patients from the Metropolitan region (1307/1883) stands out,⁸ being information that does not represent the regional particularities. Regarding agricultural activity, Lamure et al.⁹ found that patients with occupational exposure to pesticides had a lower 2-year overall survival (81%) than the unexposed group (92%) (AHR: 3.9; 95% CI: 1.5-10.0)⁹. Although the objective of this study was not to determine the association between survival and exposure to pesticides, it is a topic that will be developed in the future since, of the 16 regions of the country, more than half of the pesticides are consumed in the O'Higgins Region.¹⁰

Table 1 Baseline features of patients

Variable	n*	%/Mean
Age, years	106	
Mean (SD)		64.42 (13.7)
>60 (%)		66
Sex (%)	106	
Female		42.5
Male		57.5
B symptoms (%)	79	64.6
GCB/non-GCB profile (by Hans algorithm) (%)	105	
GCB		42.9
Non-GCB		57.1
BCL2 (%)	95	81.1
BCL6 (%)	71	50.7
MYC (%)	62	58.5
LDH (U/L), mean (SD)	37	303.7 (215.0)
WBC (x103/μL), mean (SD)	94	8.3 (5.0)
Hb (g/dL), mean (SD)	93	11.4 (2.5)
ANC (x103/μL), mean (SD)	93	5.9 (4.9)
Platelets (x103/μL), mean (SD)	92	254.4 (124.6)
Stage (%)	76	
I		22.4
II		26.3
III		21.1
IV		30.2

GCB, germinal center B-cell like; LDH, lactate dehydrogenase; WBC, white blood cells; Hb, hemoglobin; ANC, absolute neutrophil count; *, no lost values.

Table 2 Clinical and pathological features according to stage

Variable	n*	Early [n(%)]	Late [n(%)]	p-value
Age, years	76			
Mean (SD)		64.8 (12.5)	61.9 (15.0)	0.352
>60		26 (70.3)	23 (59.0)	0.304
Sex	76			
Female		19 (51.4)	13 (33.3)	0.112
Male		18 (48.6)	26 (66.7)	
B symptoms	70	17 (48.6)	29 (82.9)	0.003
GCB/non-GCB profile (by Hans algorithm)	76			
GCB		15 (40.5)	17 (43.6)	0.788
Non-GCB		22 (59.5)	22 (56.4)	
BCL2	69	26 (78.8)	32 (88.9)	0.252
BCL6	51	10 (45.5)	14 (48.3)	0.842
MYC	50	4 (15.4)	7 (29.2)	0.24
LDH (U/L), mean (SD)	32	239.2 (172.0)	310.0 (199.8)	0.29
WBC (x103/μL), mean (SD)	66	9.4 (6.4)	8.0 (7.2)	0.4
Hb (g/dL), mean (SD)	66	11.8 (2.2)	11.5 (2.7)	0.65
ANC (x103/μL), mean (SD)	66	6.5 (5.2)	5.5 (5.9)	0.463
Platelets (x103/μL), mean (SD)	64	255.8 (109.1)	242.6 (148.5)	0.69

GCB, germinal center B-cell like; LDH, lactate dehydrogenase; WBC, white blood cells; Hb, hemoglobin; ANC, absolute neutrophil count; *, no lost values.

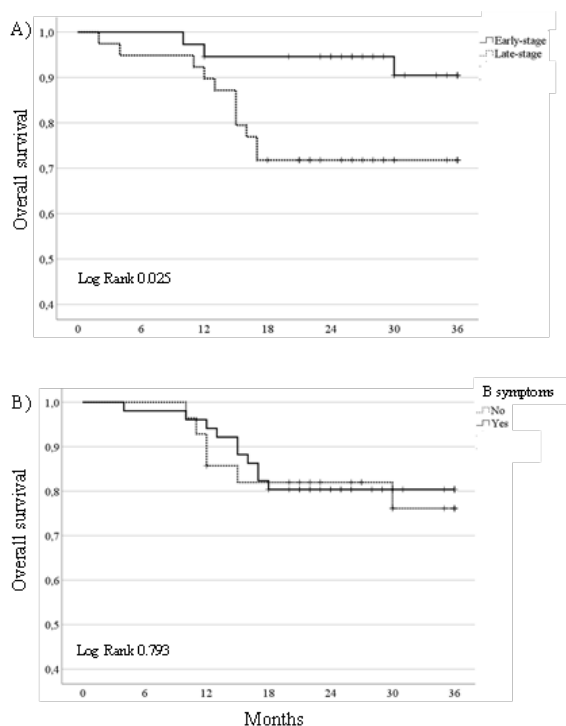


Figure 1 Overall survival at 3 years

A) Overall survival according to stage at diagnosis.

B) Overall survival according to the presence of symptoms B.

As shown in Table 1, the patients included in the study were characterized by a mean age of 64.2 years and a higher frequency of men. In addition, it was evidenced that 64.6% presented B symptoms at diagnosis, which contrasts with what was reported in Cuba by Sierra et al.¹¹ who determined a frequency of 85.7%.¹¹ Our results highlight the difference in overall survival according to the stage, being more significant in patients diagnosed in early stages and similar to those reported worldwide. Although we showed differences in the prevalence of B symptoms at diagnosis, being higher in the group of late-stage patients, this variable was not associated with overall survival (Figure 1). However, it is essential to note that currently, B symptoms are part of the IPI score that encompasses different variables and has better predictive capacity than the variables considered in isolation.¹² Although the study's aim was focused on the description of patients and their survival, it is crucial to develop association studies to determine the factors that may affect the survival of patients residing in the region.

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Conflicts of interest

The author declares that there is no conflict of interest.

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