ONCOLOGÍA
roe-solca.ec ORIGINAL ARTICLE

Characterization and survival of patients with Hodgkin's lymphoma. A 7-year report from a single center

Fanny Viviana Quinte Guaiña [1*], Rosa Nohemí Terán Terán [1], Rommel Espinoza de los Monteros [2]

1. Postgraduate in Internal Medicine, Faculty of Medicine, Pontifical Catholic University of Ecuador, Quito, Ecuador.
2. Hematology and Oncology Service, Carlos Andrade Marín Specialty Hospital, Ecuadorian Social Security Institute, Quito, Ecuador.

***Correspondence:**

vivianaquinte@yahoo.com

Ave 12 de Octubre 1076, Quito 170143, Departamento de postgrados, Facultad de Ciencias Médicas Pontifica Universidad Católica del Ecuador. Teléfono [593] 02 299-1700. Ext 1048

Conflict of interest: The authors declare that they have no conflict of interest.

Received: March 26, 2022
Accepted: July 2, 2022
Published: August 5, 2022
Editor: Dra. Evelyn Valencia Espinoza

Cite:
Quinte F, Terán R, Espinoza de Los Monteros R. Characterization and survival of patients with Hodgkin's lymphoma. A 7-year report from a single center. Rev. Oncol. Ecu 2022;32(2):141-156.

DOI: https://doi.org/10.33821/630

Abstract

Introduction: Hodgkin's lymphoma (HL) is a rare hematological neoplasm where neoplastic cells form a minority of the tumor and are surrounded by a reactive inflammatory medium that includes lymphocytes, eosinophils, neutrophils, histiocytes, and plasma cells. The present study aimed to describe a population with this pathology and its survival after 7 years of follow-up.

Methodology: This longitudinal study was carried out at the Carlos Andrade Marín Hospital, Quito, Ecuador, from 2013-2019, with a nonprobabilistic sample of patients with HL. Demographic, clinical, and laboratory variables, Ann Arbor classification, histological classification, treatment and response, mortality, and survival time were recorded. Descriptive statistics were used: bivariate and survival analyses.

Results: Seventy-three patients were analyzed, including 43 men (58.9%). The group of 61 to 70 years was the most prevalent, with 19 cases (26%). There was 1 case (4.1%) with HIV and 7 cases (9.6%) with immunosuppressants. B symptoms in 49 cases (67.1%). Enlarged lymph nodes were observed in 15 cases (20.5%). Bulky mass in 5 cases (6.8%). Twenty-two patients died (30.1%). After survival for 52.8 months, 83.6% received adriamycin, bleomycin, vincristine, and doxorubicin as 1st-line treatments, with complete remission in 61.7%. Ann Arbor stage IV with hazard ratio (HR): 3.47, (95% CI: 1.20 – 6.11, P = 0.04), lymphocyte depletion HR: 4.98 (95% CI: 1.31 – 9.47, P = 0.04). Hemoglobin < 10.5 g/dL HR: 2.40, (95% CI: 1.47 – 5.94, P = 0.03), albumin < 4 g/dL HR: 4.02, 95% CI: 1.94 – 7.26, P = 0.01) and lymphocytes < 600 cells/µL HR: 4.57, (95% CI: 1.85 – 11.28, P = 0.001).

Conclusion: The prevalence of HL was slightly higher in men, with a ratio of 1.1:1. The incidence was bimodal, between 31-40 years and between 61-70 years, with B symptoms and enlarged lymph nodes. Stages II and III (Ann Arbor) were the most frequent. Hemoglobin and albumin were lower in the deceased. First-line treatment resulted in complete remission in 61.7% of cases. The absence of B symptoms was related to more remarkable survival; advanced stages were related to worse survival; survival was higher in patients who achieved complete remission with the first line of treatment; and overall survival was lower than that found in developed countries.

Keywords:
DeCS: Hodgkin's Disease, AIDS-Related Lymphoma, Mortality, Hospital Mortality; Mortality Registry, Survival Analysis.

DOI: 10.33821/630

Introduction

Hodgkin lymphoma (HL) is a rare hematologic neoplasm where neoplastic cells form a minority of the tumor and are surrounded by a reactive inflammatory milieu that includes lymphocytes, eosinophils, neutrophils, histiocytes, and plasma cells [1]. Its distribution is bimodal, with the first peak at 20 years of age and the second in those over 55 years of age. The exact etiology is not known, but associated factors, such as Epstein Barr virus (EBV) infection, family history of HL, and immunosuppression, have been found [2]. The incidence of HL is increased after solid organ transplantation, a history of rheumatoid arthritis (RA), systemic lupus erythematosus (SLE), and sarcoidosis [1].

The World Health Organization (WHO) recognizes two main types of HL: classical and predominantly nodular lymphocytes (PLNs). Classic HL accounts for more than 90% of cases and includes nodular sclerosis (NS), mixed cellularity (MC), lymphocyte-rich (RL), and lymphocyte-depleted (DL) variants. The PLN variant makes up approximately 5% of cases [3].

HL can manifest as painless lymphadenopathy; 50 to 80% of patients have a mass in the mediastinum, and others have dyspnea, cough, or obstruction of the superior vena cava. Systemic symptoms occur in more than 25% of patients, such as fever, night sweats, and weight loss (unintentional decrease of more than 10% of body weight over six months) [4].

In order of frequency, patients present with supra-diaphragmatic lymphadenopathy, followed by retroperitoneal and inguinal lymphadenopathy. Other sites, such as the spleen, liver, lungs, and bone marrow, may also be affected. A definitive diagnosis is histopathological, in which it is necessary to identify Reed-Sternberg (RS) cells [2].

The general objective of this study was to carry out epidemiological, clinical characterization, and survival analyses of patients with HL evaluated in a specialty hospital over seven years.

Materials and methods

Study design

The present study is observational, descriptive, retrospective, and cross-sectional.

Study area

The study was conducted in the hematology and oncology department of the Carlos Andrade Marín Specialty Hospital of the Ecuadorian Institute of Social Security in Quito, Ecuador. The study period was from January 1, 2013, to December 31, 2019.

Universe and sample

The population was made up of patients admitted to the hospitalization of the institution. The sample calculation was nonprobabilistic for census-type convenience, in which all possible analyzable cases are included.

Participants

Adult patients with a histological diagnosis of Hodgkin's lymphoma admitted to the institution were included. Records with incomplete data were excluded from the analysis.

Variables

Sociodemographic variables were included: age, sex, ethnicity, and origin. Clinical variables: comorbidities, immunosuppressive treatment, family history of lymphoma, B symptoms, history of HIV, onset symptoms, Ann Arbor classification, presence of chest mass, histological classification (WHO); Paraclinical variables: T lymphocytes, hemoglobin, platelets, albumin, creatinine. First-line treatment and response, second-line treatment and response, third-line treatment and response, radiotherapy, mortality, and survival time.

Procedures, techniques, and instruments.

The data were collected from the clinical history in a form designed exclusively for that purpose. The institutional electronic system was used for case investigation. The following root codes of the ICD-10 international classification related to Hodgkin lymphoma (C81) were used. The database was coded with serial numbers, thus protecting the confidentiality of the information and identity of the patients.

Bias avoidance

To guarantee the reliability of the information, the researchers were trained in data collection, and a double checklist was used to include all cases. The data were validated and curated by the researchers FVQG and RNTT. To avoid possible interviewer, information, and memory biases, the data were guarded at all times by the principal investigator with appropriate guidelines and records. Observation and selection bias was avoided by applying the participant selection criteria. All the clinical and paraclinical variables of the hemodialysis sessions of the period above were recorded. Two researchers independently analyzed each record in duplicate, and the variables were recorded in the database once their agreement was verified.

Statistical analysis

Initially, a descriptive univariate analysis of the sample is performed, and survival analysis is presented in a secondary analysis. In the bivariate analysis, 2 x 2 tables were used to compare the proportions of qualitative variables. The chi-square test and the odds ratio (OR) were used for statistical interpretation. The p value as a significant measure was less than 0.05, and the Kaplan–Meier method was used for survival analysis. The statistical package used was SPSS version 21.0 for PC (Armonk, NY: IBM Corp.) licensed by the Pontificia Universidad Católica del Ecuador.

Results

Study participants

The study included 73 analyzable cases (Figure 1).

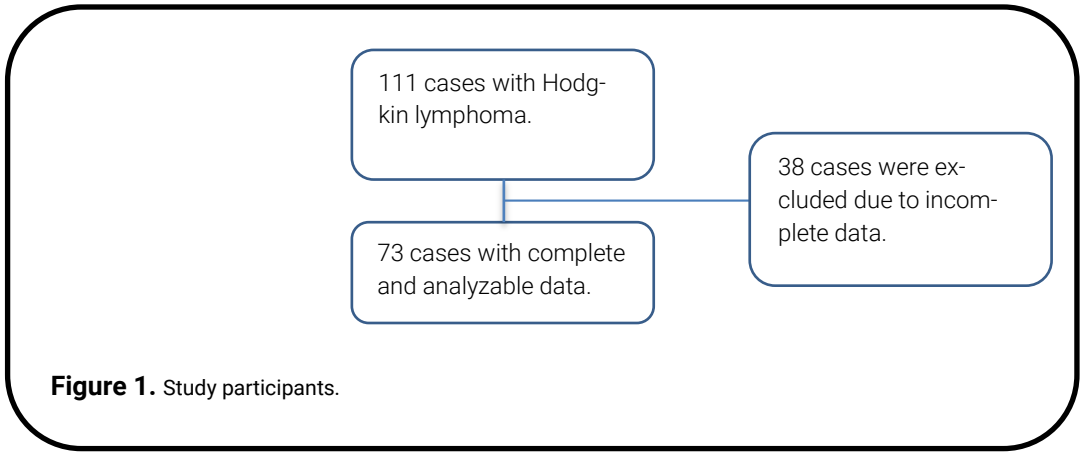

Figure 1. Study participants.

Sample characterization

There were 43 men (58.9%) and 30 women (41.1%). The most prevalent group was 61 to 70, with 19 cases (26%) (Table 1). Sixty-eight cases (93.2%) were of mestizo (Hispanic) ethnicity, 3 were Afro-Ecuadorian (4.1%), one was an indigenous patient (1.4%), and 1 was an Anglo-Saxon patient (1.4%). Seven cases were from the Ecuadorian coast (9.6%), 65 cases were from the mountains (89%), and 1 case was from the east (1.4%). A total of 75.3% of the participants did not present with diseases prior to the diagnosis of HL. A total of 75.3% of the patients were screened for HIV, and 4.1% were reactive to this virus. A total of 9.6% (7 cases) received treatment with immunosuppressants. A total of 9.6% (7 cases) had a family history of neoplasms.

Table 1. Comorbidities and pathological antecedents in the study group.

	n=73	Percentage	Accumulated percentage
Age			
18 to 30 years	12	16.4%	16.4%
31 to 40 years	17	23.2%	39.6%
41 to 50 years	6	8.2%	47.8%
51 to 60 years	6	8.2%	56.3%
61 to 70 years	19	26.0%	82.3%
71 to 80 years	10	13.6%	95.9%
>81 years	3	4.1%	100.0%
Previous comorbidities			
Autoimmune diseases	2	2.8%	2.8%
AIDS	3	4.1%	6.9%
Mellitus diabetes	4	5.4%	12.3%
Arterial hypertension	3	4.1%	16.4%
Chronic obstructive pulmonary dis-	2	2.7%	19.1%
Neoplasms	4	5.4%	24.5%
None	55	75.3%	100%

AIDS: Acquired Immunodeficiency Virus

Symptoms

At the time of diagnosis, 67.1% of the patients showed B symptoms, and 20.5% had enlarged lymph nodes. 6.8% showed a bulky mass (Table 2).

Table 2. Clinical manifestations and imaging findings of patients with Hodgkin's lymphoma.

	n=73	Percentage	Accumulated percentage
B-symptoms	49	67.1%	67.1%
adenomegaly	15	20.5%	87.6%
bulky dough	5	6.8%	94.4%
Fatigue	4	5.4%	99.8%
Abdominal pain	2	2.7%	*
Bone pain	1	1.4%	*

* Independent events, some patients have more than one symptom.

Laboratory

The average leukocyte count was 6,690 cells/µL; their ranges were between 3,650 and 9,730 cells/µL. The average number of lymphocytes was 1.537 cells/µL, ranging from 0.660 to 2.40 cells/µL. The mean hemoglobin was 13.1 g/dL, where the minimum was 10.61 g/dL, and the maximum was 15.89 g/dL. In the participants who survived, the mean hemoglobin was 13.61 g/dL and 11.94 g/dL in the deceased, showing significant differences between both means (*P* = 0.008). The general platelet count was 354.191 cells/µL, with a minimum count of 300.53 cells/µL and a maximum count of 407.85 cells/µL (Table 9). The mean serum albumin value was 3.53 g/dL, with ranges between 2.7 and 4.3 g/dL. In the survivors, the mean albumin was 3.70 g/dL (ranging between 2.91-4.49 g/dL) and 3.16 g/dL (ranging between 2.33-3.99 g/dL) in the deceased, with significant differences in the means in both groups (*P* =0.010).

Bivariate analysis

The analysis of the group of deceased patients of 22 cases (30.1%) was compared with the group of living patients of 51 (69.9%). The laboratory variables hemoglobin and albumin were statistically lower in the deceased group (Table 3).

Table 3. Clinical manifestations and imaging findings of patients with Hodgkin's lymphoma.

Parameter	Alive n=51	Deceased n=22	t*/X2	P*
Leukocytes (cells/µL x 10^3)	6.77 ± 3.03	6.52 ± 3.16	0.320	0.750
Lymphocytes (cells/µL x 10^3)	1.64 ± 0.79	1.31 ± 1.01	1,508	0.136
Hemoglobin (g/dL)	13.61 ± 2.39	11.94 ±2.38	2,747	0.008*
Platelets (cells/µL x 10^3)	403.55 ± 630.78	239.77 ± 143.22	1,200	0.234
Albumin (g/dL)	3.70 ± 0.79	3.16 ± 0.83	2,636	0.010
Creatinine (mg/dL)	1.05 ± 1.14	1.27 ± 1.5	-0.703	0.484
Age >61 years	19 (36.8%)	13 (62.7%)	3,910	0.048
sex woman	22 (43.1%)	8 (36.4%)	0.291	0.589
Family history of neo	6 (11.8%)	1 (4.5%)	0.924	0.336
With comorbidities	11 (21.6%)	7 (31.8%)	2,485	0.478
Treatment with immunosuppres-	6 (11.8%)	1 (4.5%)	0.924	0.336
B-symptoms	32 (62.7%)	17 (77.3%)	1.47	0.225
Bulky	4 (7.8%)	1 (4.5%)	0.262	0.609

The T Value: applies to variables in scale; the $X^{2\,value}$ applies to proportions.

Age over 61 years was more prevalent in the deceased group; in the rest of the categorical variables, there were no statistically significant differences (Table 3: last six rows). The most frequent histological type was mixed cellularity (MC), representing 43.8%, followed by the nodular sclerosis variant (NS), at 28.7%. The patients who died presented the most histological variants of BC, followed by lymphocyte depletion (50% and 27.3%, respectively). According to the response to treatment, there were significant differences in the cases of the group of deaths from first-line treatment and their complete remission (Table 4).

Table 4. Histological type and treatment concerning the mortality of patients with Hodgkin's lymphoma.

Parameter	Alive n=51	Deceased n=22	t*/X2	P*
Lymphocyte-predominant nodular	5 (9.8%)	4 (18.2%)	3,620	0.460
Rich in lymphocytes	1 (2.0%)	1 (4.5%)		
nodular sclerosis	21 (41.2%)	6 (27.4%)		
mixed cellularity	21 (41.2%)	11 (50.0%)		
lymphocyte depletion	3 (5.9%)	0		
Classification Ann Arbor				
Stage I	5 (9.8%)	1 (4.5%)	3,255	0.354
Stage II	20 (39.2%)	6 (27.3%)		
Stage III	15 (29.4%)	6 (27.3%)		
Stage IV	11 (21.6%9	9 (40.9%)		
1st line treatment				
ABVD*	49 (96.1%)	12 (54.5%)	19,301	0.001
Other	2 (3.9%)	10 (45.5%)		
Response to 1st line treatment				
complete remission	43 (84.3%)	2 (9.1%)	39,638	0.003
partial remission	3 (5.9%)	2 (9.1%)		
Progression	5 (9.8%)	18 (81.8%)		
2nd line treatment				
Yes	5 (9.8%)	2 (9.1%)	0.009	0.924
None	46 (90.2%)	20 (90.9%)		
Type of 2nd line treatment				
ICE	2 (33.3%)	1 (50%)	0.444	0.801
DHAP	1 (16.7%)	0 (0%)		
ESHAP	3 (50.0%)	1 (50%)		
Response to 2nd line treatment				
complete remission	1 (20%)	0 (0%)	2.1	0.35
partial remission	2 (40%)	0 (0%)		
Progression	2 (40%)	2 (100%)		
Radiotherapy				
Nope	35 (68.6%)	16 (72.7%)	0.123	0.726
Yes	16 (31.4%)	6 (27.3%)		

*ABVD: Adriamycin, bleomycin, vinblastine, dacarbazine, **ICE: ifosfamide, carboplatin, etoposide, DHAP: cytarabine, cisplatin, dexamethasone, ESHAP: etoposide, methylprednisolone, cytarabine, cisplatin.***Pearson Chi-Square

Overall survival

The median survival was 52.8 months (95% CI: 43.11 – 62.56). In patients between 31 and 40 years of age, survival was 31.5 months (95% CI: 19.6 – 43.4); 28.3 months (95% CI: 4.6 – 52.1) in the group of 41 to 50 years; 25.2 months (95% CI: 14 – 36.4) in patients between 61 and 70 years old and three months (95% CI: 0 – 7.1) in those older than 81 years, with no significant

difference between the strata (*P* = 0.092). There were no differences in survival by sex. Patients with B symptoms had a survival of 49.7 months (95% CI: 38.1 – 61.3), without B symptoms of 55.9 months (95% CI: 41.2 – 70.6) (Figure 2).

Patients with stage III and IV disease had an increase in mortality of 19.4% and 19.8%, respectively; at 40 months, patients with stage IV disease had a mortality of 47.9%; at 60 months, the mortality was 61.15% (*P* = 0.033) (Figure 3).

Patients with stage IV disease (Ann Arbor) had a survival of 36.2 months (95% CI: 21.3 – 51.0), and those with stage III disease had a survival of 53.8 months (95% CI: 37.2 – 70.5) (Table 5). Patients with complete remission had a survival of 77.3 months (95% CI: 70.9 – 83.7), patients with partial remission of 36.7 months (95% CI: 11.6 – 61.8), and patients with progression of 20.2 months (95% CI: 9.7 – 30.6) (Table 5). Patients who did not receive radiotherapy (RT) had a median survival of 50.3 months (95% CI: 39.4 – 61.3), and those who received RT had a median survival of 54.6 months (95% CI: 36.8 – 72.4) (*P* = 0.657) (Table 5).

Cox regression.

Previous treatment with immunosuppressants increases the probability of death, HR: 1,594, family history of Lymphoma HR: 3,379, the presence of B symptoms at the time of diagnosis HR: 1.615, patients with Ann Arbor stage IV have an HR: 3.474, patients with the histological type of DL had HR: 4.975, patients with hemoglobin <10.5 g/dL, HR: 2,395, albumin <4 g/dL, HR: 4.020, lymphocytes < 600 cells/µL had HR: 4. 572. Partial remission with the first line of treatment increased mortality with an HR of 9.331 and disease progression with an HR of 23.299 (Table 6).

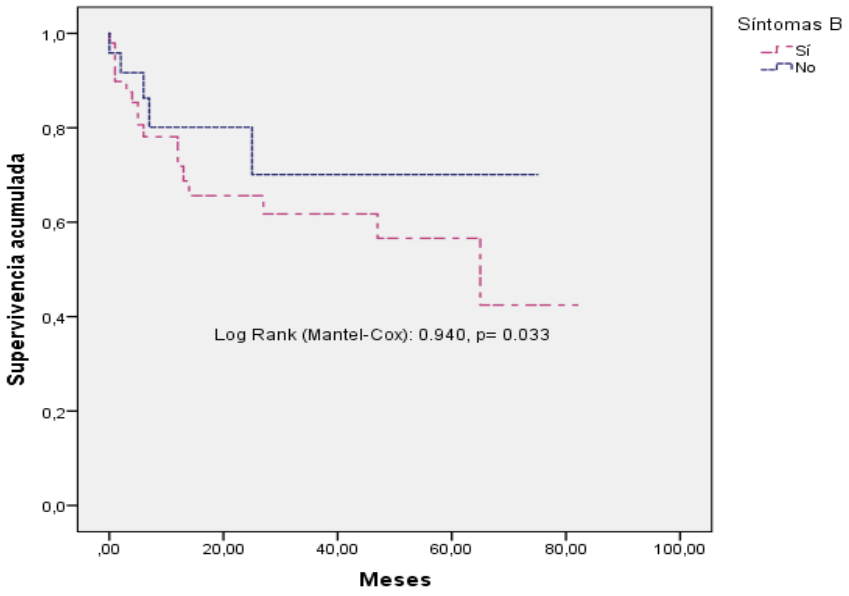

Figure 2. Survival analysis according to symptoms B.

Table 5. Survival concerning study variables.

Variable	Mean	CI 95%	
		Lower limit	Upper limit
Age			
18 to 30 years	17.3	6.1	28.4
31 to 40 years	31.5	19.6	43.4
41 to 50 years	28.3	4.6	52.1
51 to 60 years	18.3	0.0	38.4
61 to 70 years	25.2	14.0	36.4
71 to 80 years	15.6	1.1	30.1
Older than 81 years	3.0	0.0	7.1
Sex			
Female	46.3	34.1	58.5
Male	52.0	39.8	64.2
B-symptoms			
Yes	49.7	38.1	61.3
No	55.9	41.2	70.6
Ann Arbor Classification			
Stage I	58.0	29.1	86.9
Stage II	61.7	47.6	75.8
Stage III	53.8	37.2	70.5
Stage IV	36.2	21.3	51.0
Response to first-line treatment			
Complete remission	77.3	70.9	83.7
Partial remission	36.7	11.6	61.8
Progression	20.2	9.7	30.6
Radiotherapy			
No	50.3	39.4	61.3
Yes	54.6	36.8	72.4

CI: confident interval

Discussion

In this study, the proportion of men was 58.9%, similar to previous studies in Spain [5] and Latin America [6], with 459 patients and 6800 cases with 62% and 55% men, respectively. Clearly, HL has been described as a male-predominant disease. According to SEER, the life-time risk of developing the disease is 0.26% in men and 0.22% in women.

According to the American study [7], with 41,405 cases, there was a greater prevalence between 20-29 years (23.8%), followed by 30-39 years (19%), which differs from the present study, where the most affected were 61-70 years (26%), followed by 31-40 years (23.2%), in contrast to the present findings, in a Latin American cohort [8], with 75 patients, in which the most affected group was between 18 -38 years (68%). It is known that in industrialized countries, the presentation is bimodal, while in developing countries, the incidence is high in childhood and decreases with age, which differs markedly in the present study because it does not consider the pediatric population. In this study, 93.2% of patients self-identified as hispanic.

Table 6. COX regression with survival concerning study variables.

Risk factor	HR	CI 95%		p
		Lower limit	Upper limit	
Sociodemographic, history, and clinical presentation				
Male sex	1.263	0.527	3.027	0.601
Treatment with immunosuppressants	1.594	1.112	4.006	0.045
Family history of Hodgkin lymphoma	3.379	1.451	5.291	0.024
Presence of B Symptoms	1.615	1.027	3.671	0.034
Classification Ann Arbor				
Stage I	1.682	0.223	12.659	0.614
Stage II	1.737	0.678	4.448	0.250
Stage III	1.942	0.368	3.408	0.100
Stage IV	3.474	1.202	6.112	0.036
histological type				
Lymphocyte-predominant nodular	2.096	0.698	6.296	0.187
Rich in lymphocytes	1.654	0.220	12.410	0.625
nodular sclerosis	1.265	0.493	3.244	0.425
mixed cellularity	1.754	0.455	2.444	0.302
lymphocyte depletion	4.975	1.313	9.472	0.041
Laboratory parameters				
Hemoglobin < 10.5 g/dL	2.395	1.466	5.941	0.029
Albumin < 4 g/dL	4.020	1.936	7.257	0.011
Leukocytes > 15,000 cells/µL	2.885	0.446	11.648	0.057
Lymphocytes < 600 cells/µL	4.572	1.853	11.282	0.001
Response to first-line treatment and other treatments				
partial remission	9.331	1.306	16.683	0.026
Progression	23.299	5.384	44.826	0.002
Radiotherapy	1.235	0.482	3.161	0.660

HR: Hazard Ratio, CI: Confidence Interval

In the present study, 89% of the patients referred to the Sierra region as their place of residence, most of them residing in Quito since the Carlos Andrade Marín Hospital is the area of influence.

Regarding comorbidities prior to the diagnosis of HL, the present study highlighted arterial hypertension and diabetes mellitus 2, whose frequency is close to what was previously found [8], with 5.4% hypertensive and 2.7% diabetic but different from what was previously found. As evidenced in an English population [9] with 7,420 patients, at least 5% had arterial hypertension, and 15% had diabetes. At least 9.3% of the Ecuadorian population suffers from high blood pressure and 7.6% from diabetes, which explains these results.

A total of 4.1% of the patients had HIV infection, which is consistent with the American descriptive study [10], with 22,355 cases, of which 3.79% were PLW; different from what was reported in Africa [11], with 219 patients with HL, 17% were HIV seropositive due to the general prevalence of HIV in that population.

In the present investigation, 4% of the patients presented autoimmune diseases, including rheumatoid arthritis (RA) and systemic lupus erythematosus, with no statistical association with HL. Several studies have shown that the use of immunosuppressants promotes the appearance of neoplasms, especially in late periods, according to a systematic review [12]: it is indicated that the use of immunosuppressants is related to an increased risk of cancer. In this sense, in a Swedish study with 12,656 cases of RA, the risk of presenting HL with the use of

corticosteroids was HR 0.5 [95% CI: 0.3–0.8] and with methotrexate (HR 0.9 [95% CI 0.9–1.0]) [13]. The present study showed that 9.5% of patients received immunosuppressants.

Familial HL represents 4.5% of all cases; in adolescents and young adults, there is a 99-fold increased risk among monozygotic twins and a 7-fold increased risk among siblings. In the present cohort, a lower percentage was obtained (2.7%); a Nordic descriptive study involving 57,475 first-degree relatives of 13,922 HL patients reported a 5.4- to 5.8-fold increased risk of HL in first- and second-degree relatives, respectively. This difference may be because the results we compared were obtained from a database [14].

At least two-thirds of the patients had B symptoms, different findings from previous reports [6] of 26.6%, which depends on the earlier diagnosis, and most of the patients in this study were older than 60 years, in whom the predominance of B symptoms is known as an atypical presentation.

A total of 20.5% of the patients debuted with enlarged lymph nodes, which differs markedly from the Mexican study [15], with 2278 patients, with a prevalence of 71.4%, and from an Iraqi study [16], with 103 cases, where the frequency was 71.4%. An explanation in which painless adenopathies at the local level are not a manifestation for which patients usually consult.

The bulky mass influences prognosis and treatment planning; according to some reports, the prevalence is 30-50% [1, 8]; in this investigation, it was 7.8%, which the small number of study participants could have influenced.

According to the World Health Organization, 95% of cases are classic HL, and 5% are NLPHL; the first group includes EN (70% of cases), CM (20% of cases), rich in lymphocytes (5% of cases), and lymphocyte depletion (5% of cases). In the present report, the most frequent histological types were BC, representing 43.8%, followed by the EN variant 28.7%, which differs from a previous study with reports between 44% and 51% [18-20].

In the present study, 35.6% were classified as stage II, and 28.7% as stage III, which is close to that cited by Cabrera et al. [19], who described that stage II was present in 36% and stage III in 28%, but it is different from what was previously found [6], in which 27.7% were classified as stage II, and 14.8% were classified as stage III.

Regarding laboratory studies, in the present study, hemoglobin was 12.77 g/dL, lymphocytes 1,537 µL x 10, platelets 321,000 µL, and albumin 3.5 g/dL; close averages have been previously reported [21], similar to what is done in other countries [22-23]. With the ABVD scheme, complete remission was 61.6%, similar to that found in a Latin American study [24], in which 57% achieved remission.

A total of 30.1% of the patients were treated with radiotherapy (RT); reported RT use ranged from 22.7% to 45.05% [15, 25].

At month 45, survival was 60%, notably far from what was found in a population-based study, which included nine SEER cancer registries (16,488 cases), in which survival was 80% [26]. In the present group, there was a delay in the start of treatment and its irregularity.

The survival of patients who achieved complete remission with first-line treatment was 90%, similar to that described by Jaime - Perez et al. [24], with survival between 73.8-89.2%.

With the factors involved in the increase in mortality, the study by Yu et al. [18] determined that the presence of B symptoms increases the risk of mortality with an HR of 2.13 (P = 0.029), which is somewhat lower than that found in the present study, where B symptoms increase the risk of death with an HR of 1.615 (95% CI: 1.027 – 3.671; P = 0.034). In contrast, Jaime et al. [24] described an increase in mortality with an HR of 0.38 (P = 0.22).

The increased mortality risk could be because most patients with B symptoms are older than 45 years, which constitutes an additional unfavorable prognostic factor. The advanced stage of Ann Arbor increases the risk of death with an HR of 3.474, CI 95%: 1.202 – 6.112; *P* = 0.036), which is close to what was found in the study by Biasoli et al., 2016, with 674 cases, where the advanced stage was associated with an increased risk of mortality with an HR: 2.6; 95% CI: 1.26-5.51; *P* = 0.01, Ebied et al., [25], who found advanced stages increased the probability of death with HR 1.98, 95% CI: 1.68–2.34; *P* <0.0001.

In addition, patients with the histological type of lymphocyte depletion also showed a significant increase in the probability of death during follow-up (HR 4.975, 95% CI: 1.313 – 9.472; *P* = 0.041); the risk was more significant than that indicated in previous work [6], where the probability of death had HR 3.39 95% CI: 1.49–7.71; *P* =0.01. Previous treatment with immunosuppressants increased the probability of death at follow-up, with an HR of 1.594 (95% CI: 1.112 – 4.006, *P* = 0.045).

The increased mortality risk is also related to the use of immunosuppressive drugs. In this study, the exposure time was not considered, so these data cannot be extrapolated to our population.

Conclusions

The prevalence of HL was slightly higher in men than in women, with a ratio of 1.1:1. The incidence by age had two peaks, between 31-40 years and between 61-70 years. Diabetes and hypertension were the significant comorbidities prior to diagnosis. The most frequent symptomatology was B symptoms, and the second most frequent clinical manifestation was enlarged lymph nodes. A bulky mass was described in less than 10% of the participants. The most common histological types were CM and EN. Stages II and III (Ann Arbor) were the most frequent. The average hemoglobin and albumin levels were lower in the deceased. For first-line treatment, ABVD was used, with complete remission in 61.7% of cases. The absence of B symptoms was related to more remarkable survival; advanced stages were related to worse survival; survival was higher in patients who achieved complete remission with the first line of treatment; survival was not affected by the use of radiotherapy; and overall survival was lower than that found in developed countries.

Editor's note

Revista Oncología Ecu remains neutral with respect to jurisdictional claims on published maps and institutional affiliations..

Abbreviations

HL: Hodgkin lymphoma.
HIV: human immunodeficiency virus.
EBV: Epstein Baar virus.
WHO: World Health Organization.
RT: Radiotherapy.
ABVD: adriamycin, bleomycin sulfate, vincristine sulfate, dacarbazine.
Gy: Grays.
SG: Overall survival.
OR: odds ratio.
ECOG: Eastern Cooperative Group of Oncology.

Administrative information

Additional Files

The authors declare none.

Acknowledgments

The authors thank all the people of the institutions who collaborated in the development of this research.

Author contributions

Fanny Viviana Quinte Guaiña: conceptualization, validation, visualization, methodology, project management, writing: original work.

Rosa Nohemí Terán Terán: conceptualization, data curation, formal analysis, fundraising, research, resources, software.

Rommel Espinoza de Los Monteros: Writing: Review and editing, Supervision, Validation, visualization, methodology.

All authors read and approved the final version of the manuscript.

Financing

The authors did not receive any financial recognition for this research work. Expenses incurred in studies and laboratory tests constitute the usual expense of patients admitted to the institution and did not constitute an additional expense. The authors subsidized the administrative costs of this research.

Availability of data and materials

Data availability is available upon request to the corresponding author. No other materials were reported.

Statements

Ethics committee approval

It does not apply to observational studies with databases or medical records reviews.

Consent to publication

This does not apply to studies that do not publish explicit images such as CT scans, MRIs, and physical exam images.

Conflicts of interest

The authors declare that they have no conflict of interest or competence.

References

1. Shanbhag S, Ambinder RF. Hodgkin lymphoma: A review and update on recent progress. CA Cancer J Clin. 2018 Mar;68(2):116-132. DOI: 10.3322/caac.21438. Epub 2017 December 1. PMID: 29194581 ; PMCID: PMC5842098.

2. Ansell SM. Hodgkin Lymphoma: Diagnosis and Treatment. Mayo Clin Proc. 2015Nov;90(11):1574-83. DOI: 10.1016/j.mayocp.2015.07.005. PMID: 26541251.

3. Wahed A, Quesada A, Dasgupta A. Chapter 14-Hodgkin lymphoma. Hematology and Coagulation (Second Edition) A Comprehensive Review for Board Preparation, Certification, and Clinical Practice. Academic Press, Elsevier, 2020, pages 217-225. DOI: 10.1016/B978-0-12-814964-5.00014-0

4. Wang HW, Balakrishna JP, Pittaluga S, Jaffe ES. Diagnosis of Hodgkin lymphoma in the modern era. Br J Hematol. 2019Jan;184(1):45-59. DOI: 10.1111/bjh.15614. Epub 2018 November 8. PMID: 30407610 ; PMCID: PMC6310079.

5. Solans M, Serra L, Renart G, Osca-Gelis G, Comas R, Vilardell L, Gallardo D, Marcos-Gragera R. Incidence and survival of Hodgkin lymphoma patients in Girona (Spain) over three decades: a population-based study. Eur J Cancer Prev. 2017 Sep;26 Joining forces for better cancer registration in Europe: S164-S169. DOI: 10.1097/CEJ.0000000000000383. PMID: 28590273.

6. Arevalo-Zambrano M, Molina-Pimienta L, Fernandez-Avila D. Demographic Characteristics and Prevalence of Hodgkin Lymphoma in Colombia Based Upon Database of Health Care System. Clinical Lymphoma Myeloma and Leukemia, 19(September), S309–S310. https://doi.org/10.1016/j.clml.2019.07.276

7. Borchmann S, Müller H, Engert A. Hodgkin Lymphoma has a seasonal pattern of incidence and mortality that depends on latitude. Sci Rep. 2017 Nov 2;7(1):14903. DOI: 10.1038/s41598-017-14805-y. PMID: 29097683 ; PMCID: PMC5668282.

8. Quintero Sierra Y, Teruel Herrero A, Hernández Padrón C, Concepción Fernández Y, Romero González A, Macia Pérez I. Characterization of Hodgkin lymphoma in adult patients. Cuban Journal of Hematology, Immunology and Hemotherapy, 2019;35(3):1–39. SCIELO: 300006

9. Fowler H, Belot A, Ellis L, Maringe C, Luque-Fernandez MA, Njagi EN, et al. Comorbidity prevalence among cancer patients: a population-based cohort study of four cancers. BMC Cancer. 2020 Jan 28;20(1):2. DOI: 10.1186/s12885-019-6472-9. PMID: 31987032 ; PMCID: PMC6986047.

10. Shiels MS, Koritzinsky EH, Clarke CA, Suneja G, Morton LM, Engels EA. Prevalence of HIV Infection among US Hodgkin lymphoma cases. Cancer Epidemiol Biomarkers Prev. 2014 Feb;23(2):274-81. DOI: 10.1158/1055-9965. EPI-13-0865. Epub 2013 December 10. PMID: 24326629 ; PMCID: PMC3946161.

11. Swart L, Novitzky N, Mohamed Z, Opie J. Hodgkin lymphoma at Groote Schuur Hospital, South Africa: the effect of HIV and bone marrow infiltration. Ann Hematol. 2019 Feb;98(2):381-389. DOI: 10.1007/s00277-018-3533-0. Epub 2018 November 5. PMID: 30397846.

12. Hemminki K, Huang W, Sundquist J, Sundquist K, Ji J. Autoimmune diseases and hematological malignancies: Exploring the underlying mechanisms from epidemiological evidence. Semin Cancer Biol. 2020 Aug;64:114-121. DOI: 10.1016/j.semcancer.2019.06.005. Epub 2019 June 7. PMID: 31181268.

13. Hellgren K, Baecklund E, Backlin C, Sundstrom C, Smedby KE, Askling J. Rheumatoid Arthritis and Risk of Malignant Lymphoma: Is the Risk Still Increased? Arthritis Rheumatol. 2017 Apr;69(4):700-708. DOI: 10.1002/art.40017. PMID: 27992692.

14. Kharazmi E, Fallah M, Pukkala E, Olsen JH, Tryggvadottir L, Sundquist K, Tretli S, Hemminki K. Risk of familial classical Hodgkin lymphoma by relationship, histology, age, and sex: a joint study from five Nordic countries. Blood. 2015 Oct 22;126(17):1990-5. DOI: 10.1182/blood-2015-04-639781. Epub 2015 August 26. PMID: 26311361.

15. Rivas-Vera S, Ramírez-Ibarguen A, Figueroa-Acosta R, Ledesma-Osorio Y. Hodgkin lymphoma: burden of the disease in Mexico. Construction of a proxy measure with administrative data of the National Health System. Mexican Gazette of Oncology, 2019;18(4):1–6. DOI: 19000188

16. Shamoon RP, Ali MD, Shabila NP. Overview and outcome of Hodgkin's Lymphoma: Experience of a single developing country's oncology center. PLoS One. 2018 Apr 12;13(4):e0195629. DOI: 10.1371/journal.pone.0195629. PMID: 29649329 ; PMCID: PMC5896958.

17. Qi S, Milgrom S, Dabaja B, Tsang R, Levis M, Ricardi U, Lopez-Alonso R, Dann EJ, Ng A, Yahalom J. Two distinct prognostic groups in advanced-stage Hodgkin lymphoma revealed by the presence and site of bulky disease. Blood Adv. 2020 May 12;4(9):2064-2072. DOI: 10.1182/bloodadvances.2019001265. Erratum in: Blood Adv. 2021 July 13;5(13):2793. PMID: 32396621 ; PMCID: PMC7218436.

18. Yu WY, Geng M, Hao J, Chen M, Zhang SJ, Wang J, Mi JQ. Clinical Features and Prognosis Analysis of Hodgkin Lymphoma: A Multicenter Retrospective Study Over a Decade of Patients in China. Clin Lymphoma Myeloma Leuk. 2017 May;17(5):274-282. DOI: 10.1016/j.clml.2017.02.005. Epub 2017 February 17. PMID: 28292586.

19. Cabrera C, Puga L, Torres V, Salinas M. Evaluation of Hodgkin's lymphoma treatment with ABVD scheme in Chile. Medical Journal of Chile 2019;147(4):437–443. DOI: 400437.

20. Juntikka T, Malila N, Ylöstalo T, Merikivi M, Jyrkkiö S. Epidemiology of classic and nodular lymphocyte predominant Hodgkin lymphoma in Finland in 1996-2015. Act Oncol. 2020 May;59(5):574-581. DOI: 10.1080/0284186X.2019.1711166. Epub 2020 January 7. PMID: 31910680.

21. Lee J, Hue SS, Ko SQ, Tan SY, Liu X, Girard LP, et al. Clinical impact of the cell-of-origin classification based on immunohistochemistry criteria and Lymph2Cx of diffuse large B-Cell lymphoma patients in a South-east Asian population: a single center experience and review of the literature. Expert Rev Hematol. 2019 Dec;12(12):1095-1105. DOI: 10.1080/17474086.2019.1677152. Epub 2019 October 19. PMID: 31592693.

22. Martínez C, Moreno M, Cortés M, Domingo E, García R, Jarque I, et al. GELTAMO Clinical Practice Guideline for the TREATMENT OF PATIENTS WITH HODGKIN'S LYMPHOMA. Spanish Society of Hematology and Hemotherapy. Treelogy Medical Marketing SL (2019) ISBN: 978-84-09-11251-7

23. Zhang H, Song Y, Liu A, Yang H, Cen X, Zhu J, Wen J. Baseline Characteristics of 412 Hodgkin's Lymphoma Patients Diagnosed between July 2015 and May 2018: A Report from China Lymphoma Patient Registry (CLAP). Blood 2018;132 (Supplement 1): 5362. DOI: 112755

24. Jaime-Pérez J, Gamboa-Alonso C, Padilla-Medina J, Jiménez-Castillo R, Olguín-Ramírez A, Gutiérrez-Aguirre, Cantú-Rodríguez, Gómez-Almaguer D. High frequency of primary refractory disease and low progression-free survival rate of Hodgkin's lymphoma: a decade of experience in a Latin American center. Brazilian Journal of Hematology and Hemotherapy, 2017;39(4):325–330. DOI: 2017.08.001

25. Ebied A, Thanh Huan V, Makram OM, Sang TK, Ghorab M, Ngo HT, Iraqi A, Kamel MG, Dang TN, Vuong N, Hirayama K, Huy N. The role of primary lymph node sites in survival and mortality prediction in Hodgkin lymphoma: a SEER population-based retrospective study. Cancer Medicine, 2018;7(4):953–965. DOI: 4.1280

26. Mukhtar F, Boffetta P, Dabo B, Park JY, Tran CTD, Tran TV, Tran HT, Whitney M, Risch HA, Le LC, Zheng W, Shu XO, Luu HN. Disparities by race, age, and sex in the improvement of survival for lymphoma: Findings from a population-based study. PLoS One. 2018 July 11;13(7):e0199745. DOI: 10.1371/journal.pone.0199745. PMID: 29995909 ; PMCID: PMC6040734.