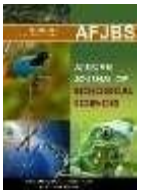
https://doi.org/10.48047/AFJBS.6.13.2024. 1883-1895

African Journal of Biological Sciences



Retrospective study of Hodgkin's and non-Hodgkin's lymphoma in the University Hospital Centre of Batna (Eastern Algeria) : Epidemiological, clinical and biological aspects

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Article History

Volume 6, Issue 13, 2024

Received: 18June 2024

Accepted: 02July 2024

doi:*10.48047/AFJBS.6.13.2024.* 1883-1895

ABSTRACT

Background : Lymphomas are defined as cancers of lymphoid tissue. Both Hodgkin's lymphoma (HL) and non-Hodgkin's lymphoma (NHL) are types of lymphoma. Numerous studies carried out over the past two decades indicate a trend towards an increase in the incidence of lymphomas (especially NHL) worldwide (Baris and Zahn, 2000 ; Bosly and Coiffier, 1997). The epidemiological, clinical and biological features of lymphoma are little studied in Algeria.

Aim : To study the epidemiological, clinical and biological characteristics of lymphomas in the hematology department at the University Hospital Center (HUC) of Batna (Algeria).

Methods : This is a descriptive retrospective study on the records of 24 patients aged over 14 years with lymphoma, treated in the same department. The analysis revealed an average age of 40 years, men are more frequently affected than women (15 men/9 women), the sex- ratio is 1.66.

Results : Our results reveal that there are 2 types of lymphoma, HL (58%) followed by NHL (42%). 62% were males and 38% females (sex ratio M/F= 1.66). The median age 29.21 years for HL and 51.7 years for NHL. Adenopathies for HL and especially abdominal pain for NHL were the main reasons for consultation. A predominance of stage IV (43%) followed by stage III (21%) for HL and a predominance of stage IV with (40%) followed by stage III (10%) for NHL. Cervical and axillary adenopathies (25%) were the most abundant for HL but for NHL were abdominal adenopathies with 34%. Secondary hepatic localization was predominant for HL and NHL. A predominance of the scleronodular type with 50% for HL and large B-cell NHL was predominant with 60%. Serology of HepatitisB, C and human immunodeficiency virus (HIV) was negative. Biologically, a predominance of hyperleukocytosis, polynuclear neutrophilic leukocytosis, lymphopenia and hypoalbuminemia were present in the majority of HL and NHL cases.

Conclusion : This study allowed us to establish an epidemiological profile of lymphoma and to study its characteristics within our region Batna. The identification of characteristics with prognostic value could allow a better therapeutic adaptation for our patients.

Keywords : Hodgkin's lymphoma, non-Hodgkin's lymphoma, Epidemiological, clinical and biological aspects, University Hospital Center (HUC) of Batna.

1. INTRODUCTION

The lymphatic system is a complex network of ducts and lymph nodes essential to the body's immune defense system. Hematological malignancies are cancers that affect the cells of the bloodstream, including those of the lymphatic system. Among these cancers, lymphomas are a common form of cancer and represent the fifth most common cancer worldwide. Their incidence has increased over the last few decades. Lymphomas affect an essential component of the body's immune system, the lymphatic system (Burnett et al., 1994).

Lymphomas are classified into two main types : "Hodgkin's lymphoma" and "non-Hodgkin's lymphoma". Each type has distinct characteristics in terms of clinical presentation, epidemiology, biology and treatment. Hodgkin's lymphoma (HL), first described by Thomas Hodgkin in 1832, is characterized by the presence of Reed-Sternberg cells in the lymph nodes. It represents around 10% of lymphoma cases and mainly affects young adults (Eddine et al., 2017). In contrast, non-Hodgkin's lymphoma (NHL) regroups different forms of malignant proliferation of the lymphoid system that develop outside the bone marrow (Jiménez-Ubieto et al., 2017). Non-Hodgkin's lymphomas present great heterogeneity in terms of clinical presentation, anatomopathology, immunology and cytogenetics, leading to significant prognostic differences between different forms of the disease (Swerdlow et al., 2016). Advances in oncology research have led to a better understanding of the biological mechanisms underlying lymphomas, as well as improved management (Shankland et al., 2012).

The aim of this work is to establish an epidemiological study of this disease in the hematology department of Batna Hospital University Center (HUC) in order to obtain significant information on these types of lymphoma and improve our understanding of their evolution and their clinical and biological characteristics.

2. METHODS

Patients and methods : This is a descriptive retrospective study on the files of 24 patients (archived from 2020, up to 2022) with Lymphoma, treated by hematologists in the hematology department at the Batna University Hospital (Algeria). In this study, we included all adult patients with Lymphoma, diagnosed by specialist doctors in the hematology department, at different stages of the disease. Patients are aged betwen 14 and 74 years, of both genders and coming from different regions of eastern Algeria.

Data collection : Patient files were used as a data source, and a pre-established form was used to collect the main clinical characteristics of each patient. This form included information such as geographical data (identity, date and place of birth, place of residence and care, date of diagnosis), anthropological data (age and sex), clinical data, reasons for consultation, biological data and evolutionary aspects. Our data were entered and analyzed using Microsoft Excel, and tables and graphs were also produced using thesame software to facilitate analysis and presentation of results.

3. RESULTS

3.1. Distribution of patients by lymphoma type

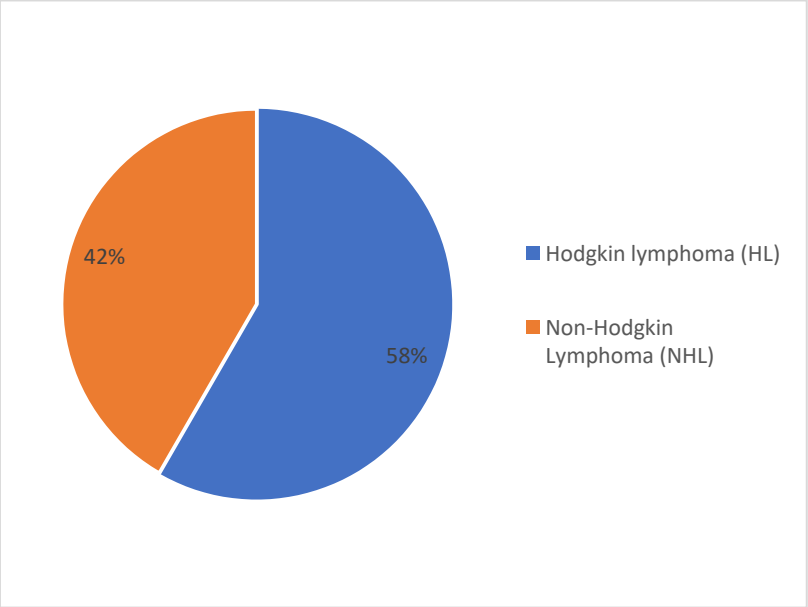

Figure 1. Distribution of patients by lymphoma type

The results in figure I indicate that there is 2 types of lymphoma, the most frequent being Hodgkin's lymphoma (HL) (58%) 14 cases followed by non-Hodgkin's lymphoma (NHL) (42%) 10 cases.

3.2. Distribution of patients by sex

This distribution is shown in Table 1.

Table 1. Distribution of patients by sex

Sex	Number			Percentage %		
	HL	NHL	Total	HL	NHL	Total
Male	8	7	15	57	70	62
Female	6	3	9	43	30	38
Total	14	10	24	100	100	100

According to Table 1, the masculine gender was predominant with 62% (HL and NHL combined). In fact, out of 09 women (38%), we had 15 men (62%) (M/F ratio 1.66).

3.3. Distribution of patients by age of disease discovery

This distribution is shown in Table 2.

Table 2. Distribution of patients by age of disease discovery

	HL		NHL	
Age group	**Number**	**Percentage %**	**Number**	**Percentage %**
[0 - 9]	**0**	**0**	**0**	**0**
[10 - 19]	**2**	**14**	**1**	**10**
[20 - 29]	**4**	**29**	**1**	**10**
[30 - 39]	**7**	**50**	**0**	**0**
[40 - 49]	**0**	**0**	**1**	**10**
[50 - 59]	**0**	**0**	**3**	**30**
[60 - 69]	**1**	**7**	**3**	**30**
[70 - 79]	**0**	**0**	**1**	**10**
Total	**14**	**100**	**10**	**100**

For the distribution of HL patients by age group, Table 2 shows a frequency peak in the population aged [30; 39] years, (50%) with 7 cases and an average age of 32.71 years. Regarding the age distribution of NHL patients, our results show a peak in the population aged [50; 59] and [60; 69] (30%) with 3 cases in each age group, with an average age of 59.33 for both age groups combined.

3.4. Family antecedents

Only one patient with HL had a cousin with Hodgkin lymphoma.

3.5. Distribution of patients by family situation

This distribution is presented in Table 3.

Table 3. Distribution of patients by family situation

Family situation	**Number**		**HL+NHL**	**Percentage %**		**Total %**
	HL	**NHL**		**HL**	**NHL**	
Married	**7**	**8**	**15**	**50**	**80**	**62**
Single	**7**	**2**	**9**	**50**	**20**	**38**
Total	**14**	**10**	**24**	**100**	**100**	**100**

The results show that married people in the studied population are the most affected, with a frequency of 62% (7 cases for HL + 8 cases for NHL) compared with single people, whose frequency is 38% (7 cases for HL + 2 cases for NHL).

3.6. Distribution of patients by consanguinity

Consanguinity results are detailed in Table 4.

Table 4. Distribution of patients by consanguinity

Consanguinity	Number		Percentage %	
	HL	NHL	HL	NHL
Yes	2	1	14	10
No	10	7	72	70
Not mentioned	2	2	14	20
Total	14	10	100	100

Consanguinity was not mentioned in the files of 4 cases (14% for HL and 20% for NHL). For the rest of the population, 10 cases of HL (72%) and 7 cases of NHL (70%) descended from non-consanguineous marriages and 3 cases from consanguineous marriages (2 for HL and 1 for NHL).

3.7. Distribution of patients according to discovery circumstances

The distribution of this result is indicated in Table 5.

Table 5. Distribution of patients according to discovery circumstances

HL			NHL		
Discovery circumstances	Number	Percentage %	Discovery circumstances	Number	Percentage %
Adenopathies	9	39	Adenopathies	1	5
Asthenia	2	9	Paresthesia	2	11
Cough	4	17	Fever	2	11
Nocturnal sweats	1	4	Asthenia	1	5
Pruritus	1	4	Nocturnal sweats	1	5
Pain	3	13	Weight loss	2	11
Weight loss	3	13	Pain	6	32
			Splenomegaly	2	11
			Rest dyspnea	1	5
			Vomiting	1	5

Concerning the circumstances in which HL was diagnosed in the patients in this study, 9 patients (39%) were discovered to have adenopathy. For the NHL patients in our study, pain especially abdominal was the most frequent reason for discovery, accounting for 6 cases (32%).

3.8. Distribution of patients by evolutionary stage at diagnosis

The different evolutionary stages according to the Ann Arbor classification are shown in figure 2.

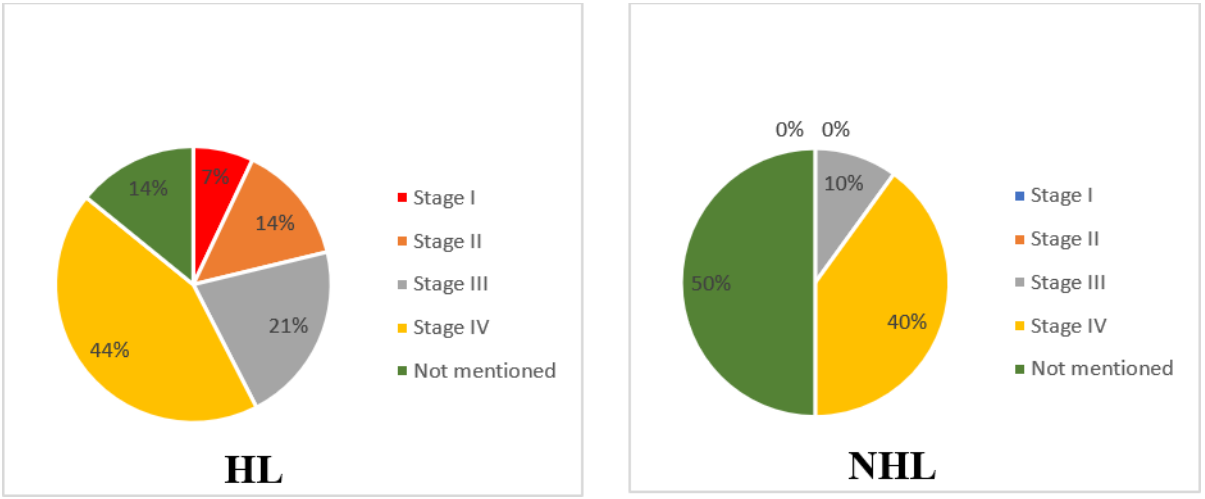

Figure 2. Distribution of patients by evolutionary stage at diagnosis

For patients with HL, the Ann Arbor classification shows a predominance of stage IV with 06 patients (43%), followed by stage III with 3 patients (21%), then stage II with 2 patients (14%) and lastly stage I with a single patient (7%). In our serie of 10 NHL patients, the stage was not mentioned in 50% of patients (5 cases), which may influence the results. Stage IV predominated with 04 patients (40%), followed by stage III with 1 patient (10%).

3.9. Distribution of patients by adenopathy localization

The localization of adenopathies is illustrated in Table 6.

Table 6. Distribution of patients by adenopathy localization

Adenopathy localization	HL		NHL	
	Number	Percentage %	Number	Percentage %
Axillary	6	25	1	8
Abdominal	2	8	4	34
Cervical	6	25	3	25
Mediastinal	5	21	3	25
Sus clavicular	5	21	1	8

Table 6 shows the distribution of our patients (LH) according to adenopathy localization, with cervical and axillary adenopathy (25%) being the most abundant, followed by mediastinal and sus clavicular adenopathy (21%) and abdominal adenopathy (8%). Concerning NHL patients, according to our results, abdominal adenopathies 34% (4 cases) are the most abundant followed by mediastinal and cervical adenopathies 25% (3 cases) and lastly axillary and sus clavicular adenopathies 8% (1 case).

3.10. Distribution of patients by secondary localization

Table 7 presents the secondary localizations identified after extension workup.

Table 7. Distribution of patients by secondary localization

HL			**NHL**		
Functional signs	**Number**	**Percentage %**	**Functional signs**	**Number**	**Percentage %**
Medullary invasion	**1**	**7**	**Medullary invasion**	**1**	**10**
lung damage	**2**	**14**	**Venous thrombosis**	**1**	**10**
Intestinal damage	**1**	**7**	**Prostatic hypertrophy**	**1**	**10**
Ovarian cyst	**1**	**7**	**Kidney damage**	**1**	**10**
Hepato-splenomegaly	**3**	**21**	**Intestinal damage**	**1**	**10**
Hepatomegaly	**2**	**14**	**Splenomegaly**	**1**	**10**
Hepatic steatosis	**3**	**21**	**Hepato-splenomegaly**	**2**	**20**
Hepatic angioma	**1**	**7**	**Hepatic angioma**	**1**	**10**
Total	**14**	**100**	**Cholestasis syndrome**	**1**	**10**
			Total	**10**	**100**

The data recorded in Table 7 indicate that secondary location of the liver is the most frequent in patients with HL : hepato-splenomegaly (21%; 3 cases), hepatic steatosis (21%; 3 cases), hepatomegaly (14%; 2 cases) and hepatic angioma (7%; 1 case). In patients with NHL, secondary location of the liver is also the most frequent, asin patients with HL.

3.11. Distribution of patients by histological type

This distribution is summarized in figure 3.

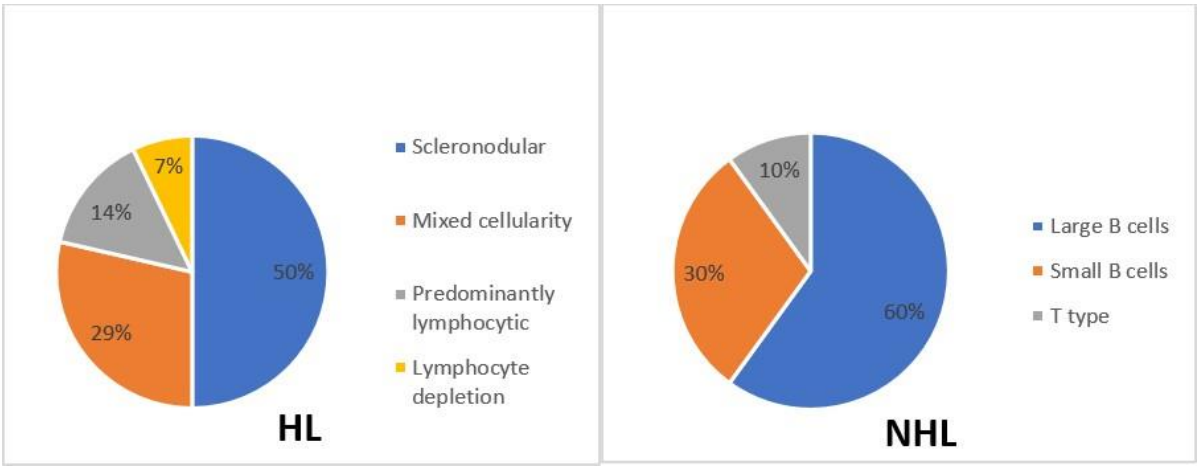

Figure 3. Distribution of patients by histological type

For HL, based on figure 3, the scleronodular type predominates, with 50% (7 cases) of cases, followed by the mixed cellularity type with 29% (4 cases) and then the two types : predominantly lymphocytic (lymphocyte- rich) and lymphocyte depletion with 14% (2 cases) and 7% (1 case) successively. For NHL, figure III reveals that large B-cells predominates in this population, with 6 cases representing 60%, followed by small B-cells (30%) with 3 cases, and T type with 10% (1 case).

3.12. Serology

All patients were tested for hepatitis B and C, and human immunodeficiency virus (HIV). 100% were negative.

3.13. Distribution of patients to most remarkable biological test results

Biological results are reported in Table 8.

Table 8. Distribution of patients according to most remarkable biological test results

Biological test results	%	
	HL	NHL
White blood cells (WBC) (> normal values)	57	50
Neutrophil Polynuclear Cells (NPC) (> normal values)	64	50
Lymphocytes (< normal values)	75	78
Albumin (< normal values)	50	50

We note from the results in Table 8 that hyperleukocytosis (high WBC level) is observed in 8 patients with HL (57%) and 5 patients with NHL (50%). The majority of patients were found to have polynuclear neutrophilic leukocytosis (increased NPC level) : 64% for HL patients and 50% for NHL patients. Decreased lymphocyte levels or lymphopenia were observed in 9 patients with HL (75%) and 7 patients with NHL (78%). Half the patients with HL and NHL presented hypoalbuminemia.

4. DISCUSSION

In this study we investigated the epidemiological, clinical and biological aspects of Hodgkin's and non- Hodgkin's lymphoma in the hematology department of Batna Hospital University Center (HUC). We mainly report here that HL was more frequent than NHL. Our results are not in accordance with studies in the literature, which showed a predominance of NHL (Peh et al., 2000 ; Omoti and Halim, 2005).

Studies on HL and NHL have shown that lymphoma affects men more than women (Peh et al., 2000 ; Mitterlechner et al., 2006). Our results confirm these studies. Male predominance in these studies has been explained by men's significant exposure to occupational and environmental risk factors than women, such as smoking, alcohol consumption and UV exposure. Some Anglo-Saxon authors have explained this predominance by certain hypotheses of the protection of the female sex by the X chromosome (Virchow, 1849).

Concerning age, studies realized in Algeria have shown a frequency peak between 20-25 years of age for LH and two peaks for LNH, under 35 and around 60 years of age (Boujerra, 2009). In Africa, a frequency peak hasbeen observed between 26-34 years for LH and between 15 -24 for LNH (Diop et al., 2010). This age distribution is different from that found in the USA, where incidence increases with age. This difference may belinked to variations in population structure, but it may also be due to different etiological factors.

The results of the family situation have no impact on the disease, but it is apparently important in terms of support and morale. 62% of the patients in our study were lucky enough not to have to face the disease alone.
In this cohort, only one patient had a family history of Hodgkin's lymphoma. He had a cousin with Hodgkin lymphoma. In complex pathologies such as lymphoma, there are no clearly defined major predisposition genes with high penetrance. Epidemiological analyses show that there are risk factors based on family history, with an increased risk of lymphoma if there is a family history of lymphoma, or of other hematological diseases, with an increased risk for each lymphoma subtype. The risk of developing lymphoma is multiplied by 10 if there is a history of this disease in the ascendants. This may suggest the presence of a multifactorial genetic predisposition, with the need to identify these responsible genes and their variants, which would increase susceptibility to lymphoma (Messaoud, 2016).

As for consanguinity, the majority of our patients descended from non-consanguineous marriages (over 70%). A Moroccan study (Khaddouj et al, 2022) showed that the generation of consanguineous parents has a higher risk of non-communicable diseases such as cancer. Other studies have shown that consanguinity has little or no influence on the occurrence of lymphoma.

Our results on the discovery circumstances for HL are in line with the literature. In Diakite's (2010) series, the disease was revealed in 100% of cases by adenopathy. In most series, the discovery circumstances were dominated by adenopathies (Carde and Cosset, 1988; Chevalier et al., 1987).

In our analysis of the distribution of patients with HL according to evolutionary stage, our results are in line with those of the national study (Abad et al., 2012), with a few differences concerning stage II. However, the results of our series of NHL patients were not very similar.

Our HL results confirm that cervical adenopathies are the most frequent. But the results of NHL patients with the most abundant abdominal adenopathies are not similar to the literature (Diakite, 2010 ; Khanfir et al., 2007 ;Abad et al., 2012).

Our data indicate that secondary location of the liver is the most frequent in patients with HL and NHL. For HL, these results differ from those found by Tcheuffa in 2006, when digestive localization was preponderant at 37.8% (17/45 cases). Digestive localizations are the most important extraganglionic sites affected in malignant lymphomas (Chassagne-clément, 1999; Ruskone-Fourmestraux, 2004). With regard to NHL, our results are not identical to those of Tolo and colleagues in 1999, whose splenic secondary localization was the most frequent. Other studies show that digestive localizations were the most dominant (Chassagne-clément, 1999; Ruskone-Fourmestraux, 2004). In contrast, bone marrow was the most affected organ in other research (Achour Bouakaz and Belarouci, 2016; Badaoui, 2012).

Our HL patients showed a predominance of the scleronodular type (50%). Our results are very close to those of the study by Sam and Boudjellal in 2017 and again by Sennour and Mechenouai in 2017. The predominantly lymphocytic type appears to be predominant in other African regions, such as Togo (Diop et al., 2010). Our findings of NHL with a majority large B cells histological type are in accord with the results of (Boujerra, 2009). In Sidi bel Abbas (Western Algeria), mantle cell lymphoma is the most frequent type, followed by burkitt's lymphoma and follicular lymphoma (Moulessehoul et al., 2009). Burkitt lymphoma is predominant in Dakar (Diop et al., 2010). In Togo, diffuse large cell lymphoma is the most common (Amégbor et al., 2010).

In this study, serology for hepatitis B, C and HIV was negative in 100% of cases. In this study, serology for hepatitis B, C and HIV was negative in 100% of cases. Determining serology in patients with lymphoma is carried out at the moment of a diagnostic management for two reasons. Firstly, because of the risk of staff contamination associated with certain procedures, such as the placement of a central or peripheral approach, or the performance of various biopsies. Secondly, the therapeutic management of patients with malignant lymphoma and HIV infection is different, given the immunosuppression associated with HIV.

Based on our biological results, the hyperleukocytosis observed in 57% of HL and 50% of NHL increases the bad prognosis of these patients. These results are very similar to those found by Razi and Afoutni in 2016. The polynuclear neutrophilic leukocytosis observed in 64% of HL patients and 50% of NHL patients was explained by the action of IL1 on medullary granular precursors, whence the importance of inflammation in Hodgkin's and non-Hodgkin's lymphomas (Razi and Afoutni, 2016). The majority of patients (93%) in Razi and Afoutni's 2016 study presented lymphopenia. This decrease in lymphocyte count was also observed in the majority of patients in our study. As soon as techniques were developed to quantify lymphocyte populations in peripheral blood, it was revealed that patients with HL frequently present with peripheral lymphopenia, and that this was more frequent in patients that had advanced stages of the disease (Ayoub et al., 1999; Porrata et al., 2012). Lymphopenia in patients with HL was frequent, affecting the B lineage earlier and more often. Lymphopenia may result from defective medullary production (ontogenesis), redistribution between the blood and secondary lymphoid tissues, or excessive cell death (Hinz et al., 2001). Hypoalbuminemia was diagnosed in half the patients in this study. Albumin is a protein produced by the liver, and a drop in its blood concentration reflects alack of synthesis by amino acid deficiency, indicating malnutrition. The mechanism may be related to undernutrition due to a lack of dietary protein intake, or to increased amino acid consumption in response to aggression. In the first case, it reflects undernutrition (exogenous), and in the second, undernutrition (endogenous). A level below 35 g/l defines undernutrition, and a level below 30 g/l defines severe undernutrition (Ars.pnns, 2011). Albumin levels permit a better evaluation of nutritional status. At the time of diagnosis of hypoalbuminemia, it should be borne in mind that pathological situations can lower albumin levels outside the undernutrition, particularly in inflammatory syndromes, where hepatic synthesis is diverted in favor of the synthesis of inflammatory proteins. Liver failure and digestive or urinary leakage are other causes of lower albumin levels (Anaes, 2003).

CONCLUSION

In our retrospective study, in the hematology department of Batna Hospital University Center, concerning 24 lymphoma medical files, covering a period of 03 years from 2020 to 2022, we can better define the epidemiological, clinical and especially biological characteristics of lymphomas. At the end of this work we can propose to extend the epidemiological survey to the different Algerian territories, involving a larger number of university hospitals, in order to standardize lymphoma data in Algeria. Finally, the elaboration of national registers can give clearer ideas on the epidemiological data of the different lymphomas or hemopathies(incidence and prevalence).

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