

Epidemiological and Histopathological Profile of Hodgkin's Lymphoma in the Democratic Republic of Congo

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Summary

Hodgkin's Lymphoma (HL) is a heterogeneous group with several histological types. It is more common in young adults but its frequency varies according to geographical location. This study is going to establish the epidemiological, histopathological and immunohistochemical profile of Hodgkin's lymphoma in the Democratic Republic of Congo (DRC). We conducted a retrospective transversal descriptive study in 4 histopathology laboratories. 93 paraffin blocks were cut between 3 and 5µm and stained with hematoxylin-eosin. 10 paraffin blocks were selected for immunohistochemistry with CD15, CD30, PAX5 and LMP1 antibodies. The HL represents 24.73% of all lymphomas and 1.06% of all cancers. Only one age group was more affected, between 20 and 30 years of age. Males are more affected, with a sex ratio of 1.2:1. The majority of HL are lymph node lymphomas (91.4%). Classical type HL (HLc) is the most predominant, with 96.8%. The histological type with mixed cellularity (HLcMC) is predominant with 51.1%, followed by sclerodular (HLcSN) with 36.7%. HLcMC is more common in all age groups, except in the 1st decade. HL is associated with tuberculosis in 3% of cases. The majority (58%) of HLc were grade 2. Tumour cells expressed CD30 and CD15 in 20%, PAX5 in 60% and LMP1 in 0%. In the DRC, HL is more common in young people, men are at greater risk than women, and the histological type with mixed cellularity is more common. Reed Sternberg cells express PAX5 more than CD15 and CD20.

Keywords: Hodgkin's lymphoma; Epidemiology; Immunohistochemistry; DRC

Introduction

HL is a tumour characterised by proliferation of Reed-Sternberg tumour cells in an inflammatory cell population consisting of lymphocytes, histiocytes, plasma cells and neutrophils and eosinophils [1].

The frequency of HL varies according to age, sex and geographical region. It is rare before the 2 years of age, but more frequent in young adults, and marked by 2 peaks in frequency, between 21 and 30 years old and after 50 years old [2]. In Europe, specifically in France, a study carried out in 2018 estimated the number of new cases of HL at 2,127, 58% of which were in men [3]. In Lomé, the incidence of HL is 41% [4]. In 2008, the number of new cases of HL in Africa was estimated at 5,292, with a mortality rate of 84% [5]. Ethnicity and race are prognostic factors for HL; this has been demonstrated in South Africa, where white children with HL had a poorer prognosis than black and coloured children [6].

In the Democratic Republic of Congo (DRC), HL has been the subject of a number of studies, including one by MUBIKAYI and KALENGAYI in 1984 [7] on a total of 139 cases of HL

over a 20-year period. In 1994, another study was carried out by KABONGO and KALENGAYI [8] on a sample of 53 cases. However, since then no study has established the histopathological and immunohistochemical profile of HL in our country. The present study aims to update epidemiological data on the histopathological profile of HL in the DRC, according to the WHO 2022 classification.

Material and Methods

This was a descriptive cross-sectional and retrospective study, conducted over a 10-year period from 2013 to 2023, in 4 histopathology laboratories, including 3 in the city of Kinshasa and 1 in the city of Lubumbashi. We conveniently selected a sample of 93 biopsy slides and paraffin blocks recorded during our study period and whose diagnosis of HL was retained after review by at least two pathologists. The samples were processed using standard histopathology techniques: after dehydration, the tissues were embedded in paraffin and the blocks obtained were cut to between 3 and 5 µm using a microtome, then spread onto slides using albumin. The slides were stained with hematoxylin and eosin, then mounted with Canada balsam. A limited number of 10 paraffin blocks were selected for

immunohistochemistry using the automatic immunoperoxidase method with CD15, CD30, PAX5 and LMP1 antibodies. The slides were read using an Olympus BX41 binocular optical and co-observation microscope with 4x, 10x and 40x objectives and a CX31 binocular optical microscope with 4x, 10x and 40x objectives, with a camera on a plasma screen. The data from this study were analysed and interpreted using SPSS 25.0 software.

Results

We collected 93 cases of HL out of a total of 376 cases of all lymphomas in general, or a frequency of HL of 24.73% of all lymphomas and 1.06% of all cancers. The frequency of HL according to age follows a uni-modal curve, with only one bracket more affected, that between 21 and 30 years of age, the median age being 28 plus or minus 25 years. The minimum age is 3 and the maximum 74 (Table 1). The distribution of HL according to sex shows that males are more affected, with a sex ratio of 1.2:1. The distribution of HL according to location shows that the majority of HL are lymph node lymphomas (91.4%), while only 8.6% are extra-ganglionic. The distribution of HL according to histological type shows that classical Hodgkin's lymphoma (cHL) is the most predominant type, accounting for 96.8%, whereas nodular lymphocytic lymphoma (PLHNL) is very uncommon, accounting for only 3.2%. Mixed-cellularity classical HL (HLcMC) is the most predominant type at 51.1%, followed by scleronodular HL (HLcSN) at 36.7%. The distribution of histological types of HLc according to age shows that HLcMC is more common in all age groups, except in the 1st decade when HLcSN is more common (Table 2). The distribution of histological types of HL according to gender shows that classic HL affects more males (51 cases out of 90), whereas

PLHNL affects more females (2 cases out of 3). We encountered 1 case out of 93 or 0.01% of HL with foci of transformation into diffuse large-cell lymphoma. Tuberculosis was associated with HL in 3% of cases. The majority (58%) of HL were grade 2, corresponding to HLcMC, HLcLD and HLcSN types. Immunohistochemical analyses were performed on 10 cases of our sample; tumour cells expressed CD30 and CD15 in 20%, PAX5 in 60%, and LMP1 was negative in all cases.

Discussion

The frequency of HL in all cases of lymphoma is 24.73% or 93 cases of HL out of 376 cases of all lymphomas. This frequency is close to that found by KABONGO (20.9%) in his study carried out in the DRC over a period of 12 years, and that of MUBUKAYI and KALENGAYI (26.37%) in the DRC over a period of 20 years [8,9].

The highest incidence of HL occurs between the ages of 21 and 30 (25.8%) with a median age of 28. In line with our results, KABONGO and KALENGAYI [8] in their study carried out in the DRC found a peak in incidence during the 2nd decade, with a fall in incidence just after the 3rd decade. In developing countries, HL is more common in young people because of the high proportion of young people in the population [9]. SATISH G et al, ZHOU L et al, MUBIKAYI and KALENGAYI in their studies conducted respectively in the USA, India and the DRC found a bimodal distribution with a peak in the 2nd decade and another after the 4th decade [5,7,10]. On the other hand, LIU W et al, in their study in China, observed a high incidence after the age of 85 [11].

In our study, the distribution of HL according to sex shows that males are more affected, with a sex ratio of 1.2:1. Sex is known to be one of the risk factors for HL. Males are more affected, regardless of race, region or socio-economic level [9]. This result is in line with those of KABONGO and KALENGAYI in the DRC [8], MUBIKAYI and KALENGAYI in the DRC [7], ADAM et al in Ethiopia [9], SCHAMOON et al in Iraq [2] and ANTONIO in Brazil [12], who all found a high frequency of HL in males. In Great Britain, a multicentre epidemiological study carried out in several regions (England, Scotland, Wales) showed a variable incidence rate between the two sexes, with 2.65/100,000 inhabitants for men and 1.81/100,000 inhabitants for women [13]. BOUATBA and MAHMAL in Morocco found in their study that there is a slight male predominance with a sex ratio of 1.22 [14]. Italy is the exception, where there is a strong female predominance of the disease [15].

Table 1: LH distribution according to patient age.

Age	n = 93	%	Min	Max	Me ± EIQ
3 – 10	11	11,8	3	74	28 ± 25
11 – 20	23	24,7			
21 – 30	24	25,8			
31 - 40	12	12,9			
41 - 50	10	10,8			
51 - 60	7	7,5			
61 - 70	5	5,4			
71+	1	1,1			
TOTAL	93	100%			

This table shows that LH peaks between the ages of 21 and 30 (25.8%), and then incidence begins to fall just after this age. The minimum age is 3 years and the maximum 74 years.

Table 2: Distribution of LHc types according to age.

			Histological type				
			SN	CM	DL	PL	
Age	10-Mar	Head count	5	3	2	1	9
		%	15,6%	6,5%	22,2%	8,3%	
	20-Nov	Head count	6	13	1	4	22
		%	18,8%	28,3%	11,1%	33,3%	
	21 - 30	Head count	9	10	4	3	24
		%	28,1%	21,7%	44,4%	25,0%	
	31 - 40	Head count	5	8	1	1	12
		%	15,6%	17,4%	11,1%	8,3%	
	41 - 50	Head count	4	5	1	1	10
		%	12,5%	10,9%	11,1%	8,3%	
	51 - 60	Head count	2	4	0	1	7
		%	6,3%	8,7%	0,0%	8,3%	
	61 - 72	Head count	1	3	0	1	5
		%	3,1%	6,5%	0,0%	8,3%	

The male sex is more affected by LH during the 1st decade up to the 4th decade and the female sex is more affected after the 4th decade.

Classical Hodgkin's lymphoma is the most common histological type, accounting for 96.8% of cases. Our study correlates well with the literature, which speaks of the remarkable frequency of classical HL. The WHO classifies HL as HLc, with a worldwide estimate of approximately 95%, and PLHNL, estimated at approximately 5% [16]. This result is consistent with those of SATISH et al in the USA and ADAM in Ethiopia, who also found a predominance of HLc with 90% and 91.2% respectively [5,9].

HLc of the mixed cellularity type is predominant in all age groups, except in the 3 to 10 years of age group where the sclerodular type is more prevalent. Studies by KABONGO and KALENGAYI [8] and MUBIKAYI and KALENGAYI [7] in the DRC also revealed a predominance of the mixed cellularity type in all age groups. On the other hand, NAGPAL in the USA observed a predominance of the sclerodular type in all age groups, except in the 0-14 age group where he found a predominance of the mixed cellularity subtype [17].

Our study shows that the majority of HL is lymph node positive (91.4%). This could be explained by the fact that the lymph node is the lymphoid organ most frequently encountered in the body at multiple sites. This distribution is similar to that of SCHAMOON et al [2] who found lymph node location with 83.7%.

Our study shows that Reed Sternberg and Hodgkin tumour cells express CD30 and CD15 in 20% of cases, and PAX5 is expressed in 60% of cases. These results are totally contradictory to those found by several authors, in particular KABONGO who, in his study in the DRC in 1994, found that LH was positive for CD15 and CD30 in 75% of cases [8]. RAISS in his study carried out in Morocco in 2018 found CD15 and CD30 expression in 80% [18]. COZZOLINO [19] found in his study carried out in Italy in 2020 that PAX5 was expressed at 61.9% as in our study, but CD15 and CD30 remained highly expressed at 66.7% and 90.5% respectively. This discrepancy may be explained by the small size of our sample for immunohistochemistry and also by factors in the pre-analysis of samples, in particular the duration of fixation and the type of fixative, which may alter the antigenic sites and cause false negatives [20].

Conclusion

Through this work, we have been able to update the epidemiological and histopathological data on HL in our environment, based on the WHO 2022 classification. The incidence of HL is therefore 24.73% of all lymphomas. The age group between 21 and 30 is most affected by HL, with 25.8%. Classical HL is more predominant, with 96.8%. Mixed-cell classical HL is the most predominant histological type at 51.1%, followed by sclerodular at 36.7%. CD15 and CD30 were positive in 20% of cases, PAX5 was positive in 60% and LMP1 was negative in all cases.

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