Head and Neck Lymphomas: A Clinico- Pathologic Assesment of a Single Centre Study

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ABSTRACT

Lymphoma ranks as the third most common cancer globally, comprising approximately 3% of all malignant tumors and 15% of childhood malignancy[1–3]. Lymphoma is said to be the most prevalent non-epithelial cancer in the head and neck region, following squamous cell carcinoma, leukemia, and brain tumors. [1,2,4] The occurrence of lymphoma varies significantly depending on factors such as histological subtype, age, gender, ethnicity, geographic location, and socioeconomic status[2,4].

The aim of this study was to retrospectively investigate the sites of occurrence and various histologic types of lymphomas in the head and neck area, and to analyze the relationship between these and the age, sex, gender and the duration of the lesions in patients who presented at our center.

Method: This is a retrospective cross-sectional study, utilizing socio-demographic information such as age, sex, gender of clinically documented cases recorded during the designated study period, as well as their clinico-pathologic characteristics. Differences in proportions across age groups, tumor sites, and lesion categories, was assessed using chi-square test, supplemented by Fisher's exact test where appropriate. Statistical significance was determined at a threshold of $p < 0.05$.

Results: The mean age distribution in years, is 43.88 $\pm$ 18.57 and the mean duration of lesion in weeks, is 67.72 $\pm$ 151.74 Females had a slight predominance in the study (53.7%) compared to the males (46.7%) with M: F of 1: 0.9. There is a broad age distribution, slightly skewed towards middle-aged participants.

Majority of the lymphoma cases (81.7%) are in cervical lymph nodes accounting for 98.51% of head and neck nodal lesions. The remaining 18.3% were found in extra-nodal sites, most of which were found in the oral cavity (66.67%). Non-Hodgkin's Lymphoma made up 95.2% of all the Head and Neck Lymphomas. Of these, diffuse lymphocytic lymphoma was the most prevalent histologic type (75.6%). Of the cases that had

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Immunochemistry records, 83.3% of the histologic types of NHL were of B cell origin. Hodgkin's Lymphoma accounted for 4.8% cases of the study.

There is no statistically significant relationship between sex and the type of lymphoma p=0.33. There was no statistically significant association between Sex, the type of lymphoma, the site of the lymphoma and the duration of lesions p= 0.29

Conclusion: Head and Neck Lymphoma is of almost equal gender predilection, slightly more predominant in females and typically affect middle-aged individuals. HL is rare, less common in this study and NHL is more predominant. Of all NHL, Small lymphocytic B cell lymphomas (SLL) is more prevalent in the study. There is no significant relationship between, gender, duration of lesion and the site or type of lymphoma in the head and neck.

INTRODUCTION

Lymphoma ranks as the third most common cancer globally, comprising approximately 3% of all malignant tumors and 15% of childhood malignancy[1–3]. Lymphoma is the most prevalent non-epithelial cancer in the head and neck region, following squamous cell carcinoma, leukemia, and brain tumors[1,2,4]. The incidence of lymphoma increases with age, accounting for 3% of cancers in children under 5 and rising to 24% among adolescent aged 15 to 19[5,6]. The occurrence of lymphoma varies significantly depending on factors such as histological subtype, age, gender, ethnicity, geographic location, and socioeconomic status[2,4]. Hematolymphoid tumours in odontogenic and maxillofacial bones are exceedingly rare and also its true incidence may be underreported due to the frequent absence of symptoms and the subtle nature of lymph node enlargement[7,8]. It's also important to note that Intra oral lymphomas can resemble dental abscesses, tumors or other diseases such as osteonecrosis.[9]

Despite advances in treatment, lymphoma remains a leading cause of cancer-related deaths in adults and children, particularly those between the ages of 1 and 10. A study by Lu et al analyzing data from the Cancer Incidence in Five Continents database from 1988 to 2012, revealed a troubling rise in lymphomas across three continents and predicted a rise in oral cancers in 5 nations over a period of 15 years[10].

A significant proportion between 35% and 65% of head and neck lymphomas occur in Waldeyer's ring, the most common anatomical site for extranodal lymphoma in this region and is a lymphoid structure (Mucosa Associated Lymphoid Tissues) not classified as a traditional nodal site.[4,8] In addition, 6% to 25% of cases are seen in the salivary glands[4]. Lymphomas often present with vague symptoms such as fever, weight loss, night sweats, and lymphadenopathy[11]. These nonspecific signs can delay diagnosis, making early recognition crucial. Clinicians should maintain a high level of suspicion when encountering such symptoms[11].

Lymphomas are broadly categorized into Hodgkin's lymphoma (HL) and non-Hodgkin's lymphoma (NHL). The subtype of the lymphomas is defined based on the cell of origin: B-cell lymphomas, T-cell and natural killer-cell lymphomas (T/NK-NHL) and HL[7]. Over 20 different subtypes of NHL have been classified according to the specific subtype of lymphoid cells involved. HL typically originates in lymph nodes, with only about 3-5% of cases arising in extranodal locations. HL is more frequently seen in adolescents. In contrast, NHL often presents in extranodal sites, with up to 20- 40% of cases involving regions outside the lymph nodes, most commonly following (along) the gastrointestinal tract. In the head and neck, extranodal NHL may affect areas such as the paranasal sinuses, nasal cavity, oral cavity, salivary glands, thyroid, and orbit. Hodgkin lymphoma (HL) has a higher overall number of new cases annually compared to non-Hodgkin lymphoma (NHL)[5,6]NHL is one of the more frequently diagnosed cancers in both children and adults. The incidence of non-Hodgkin-lymphomas is rising in many regions and with variation in between different countries, incidences increased up to 35 % in the last approximately 20 years. However, the survival has improved during the last decades with nearly 30% to 50.8%, increase in the 5-year survival rate.

While improvements in treatment have significantly enhanced survival rates for patients with lymphomas, the recent integration of targeted therapies offers promise for even better outcomes with reduced long-term side

effects[2]. Risk factors for developing NHL include pre-existing immune diseases, medications, infections, unhealthy lifestyles, ethnicity, genetics, heredity, certain occupations, prior radiation exposure, and viral infections such as Epstein-Barr virus[2]. The incidence of NHL tends to increase with age, peaking during adolescence and elderly age. While Hodgkin lymphoma (HL) has a higher overall number of new cases annually compared to non-Hodgkin lymphoma (NHL)[5,6], NHL is more prevalent in children under 10, whereas HL is more frequently seen in adolescents. Both lymphomas HL and NHL encompass a variety of histologic subtypes[5,6]. Hodgkin lymphomas (HLs) typically affect lymph nodes in the neck and mediastinum, with extranodal involvement being rare—only about 5%, such as in the tonsils. In contrast, non-Hodgkin lymphomas (NHLs) display extranodal involvement in roughly 30% of cases, often in diverse locations like the major salivary glands, paranasal sinuses, mandible, maxilla, and Waldeyer's ring[7,8]. These patterns are often subtype-specific. Beyond the gastrointestinal tract, the head and neck region are a common extranodal site in NHL, seen in 11–33% of patients. Current imaging modalities such as ultrasound, Computer tomography, Magnetic resonance imaging and Positron Emission Tomography are unable to reliably differentiate between Hodgkin and non-Hodgkin lymphomas or identify their specific subtypes, making histopathological evaluation essential for diagnosis. However, certain clinical features and the anatomical distribution within the head and neck region may offer clues, as each type tends to favor particular sites[7,8].

The aim of this study was to retrospectively investigate the sites of occurrence and various histologic types of lymphomas in the head and neck area, and to analyze the relationship between these and the age, sex, gender and the duration of the lesions in patients who presented at our center.

METHODOLOGY

A retrospective cross-sectional study was conducted using medical records, surgical biopsy logs, surgical procedure inventories and histopathology registers, from the Lagos State University Teaching hospital and its affiliate, Lagos State University College of Medicine over a period of twelve years. Data obtained are from the departments of Oral Pathology & Oral Medicine and Oral & Maxillofacial Surgery. The study utilized socio-demographic information such as age, sex, gender and duration of clinically documented cases recorded during the designated study period as well as, clinico-pathologic characteristics such as tumour sites and histological type.

Analysis

Sociodemographic characteristics—including age, sex, and tumor duration—were summarized using descriptive statistics. Categorical variables were expressed as frequencies, percentages, and tabulated formats, while continuous variables were reported as means accompanied by standard deviations. To assess differences in proportions across age groups, tumor sites, and lesion categories, the chi-square test was applied, supplemented by Fisher's exact test where appropriate. Statistical significance was determined at a threshold of $p < 0.05$.

RESULT

Eighty-two patients were retrospectively enlisted for the study from records of a period of 12years. This accounts for 3.9% of 2,152 oro-facial and head &neck lesions referred to our Oral pathology laboratory in the study period.

From the study, the mean age distribution in years, is 43.88 $\pm$ 18.57 and the mean duration of lesion in weeks, is 67.72 $\pm$ 151.74 indicating that most of the participants presented late . Females had a slight predominance in the study (53.7%) compared to the males (46.7%) with M: F of 0.86. There is a broad age distribution, slightly skewed towards middle-aged participants.

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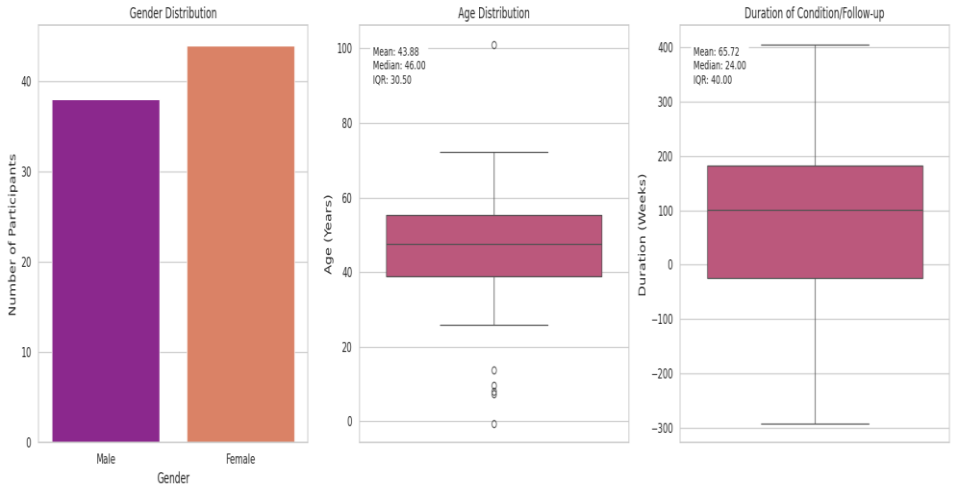
Table 1: Sociodemographic characteristics

Variables	Frequency (n=82)	Percentages (%)
Mean Age± SD (Years)	43.88±18.57	
Median Age (IQR)	46.00 (30.50)	
Mean Duration± SD (weeks)	65.72±151.74	
Gender		
Male	38	46.30
Female	44	53.70

Fig:1



Majority of the lymphoma cases (**81.7%**) are sited in **cervical lymph nodes** accounting for **98.51%** of head and neck nodal lesions. The remaining 18.3% were found in extra-nodal sites, most of which were found in the oral cavity (66.67%).

Fig: 2

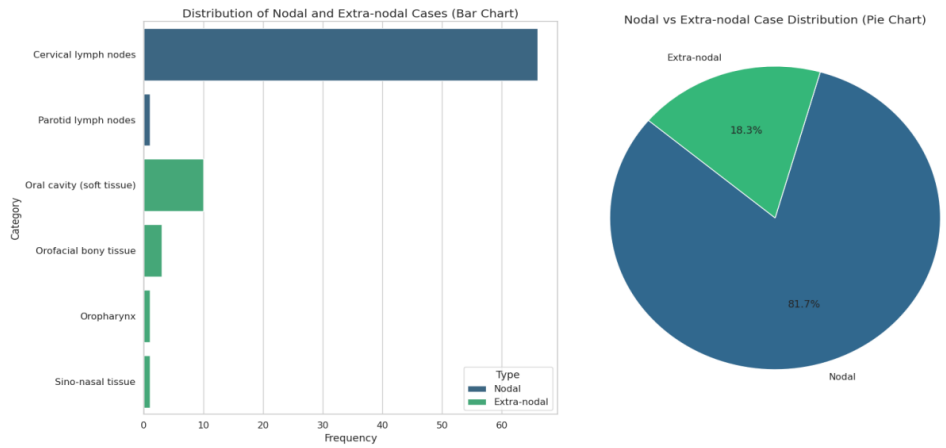


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Table 2: Site of lesions

Variables	Frequency (n=82)	Percentages (%)
Nodal		
Cervical lymph nodes	66	98.51
Parotid lymph nodes	1	1.49
Extra-nodal		
Oral cavity (soft tissue)	10	66.67
Orofacial bony tissue	3	20.00
Oropharynx	1	6.67
Sino-nasal tissue	1	6.67

Non-Hodgkin's Lymphoma made up 95.2% of all the Head and Neck Lymphomas. Of these, Diffuse lymphocytic lymphoma was the most prevalent histologic type (**75.6%**), followed by **Diffuse mixed cell lymphoma (14.7%)**. Of the cases that had Immunochemistry records, 83.3% of the histologic types of NHL were of B cell origin. **Hodgkin's Lymphoma** accounted for **4.8%** cases of the study.

Table 3: Histologic diagnosis and Immunohistochemistry

Variables		Frequency (n=82)	Percentages (%)
1. Histologic			
Hodgkin's lymphomas	Classical Hodgkin's lymphoma	2	2.40
	Nodular Lymphocyte-predominant lymphoma	2	2.40
Non-Hodgkin's lymphomas	Diffuse small cell lymphoma	62	75.60
	Diffused mixed cell lymphoma	12	14.70
	Follicular lymphoma	2	2.40
	Precursor B cell lymphoblastic	1	1.20
	Anaplastic large T cell	1	1.20

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2. Immunohistochemisty			
B cell Lymphoma		4	66.60
Precursor B-LBL		1	16.70
Anaplastic large T cell		1	16.70

There is no statistically significant relationship between sex and the type of lymphoma p=0.33. There was no statistically significant association between Sex, the type of lymphoma, the site of the lymphoma and the duration of lesions p= 0.29

Table 4: Relationship between sex and type of lymphoma

Sex	Lymphoma type		
	Hodgkin's (%)	Non-Hodgkin's (%)	P-value
Male	3 (7.90)	35 (92.10)	0.33
Female	1 (2.30)	43 (97.70)	

Neither age nor sex significantly influenced the type of lymphoma or duration of lesions, suggesting these variables are not predictive in this cohort.

Table 5: Association between various variables and duration of the lesions

Variables	Duration (weeks)			
	N	Mean rank	$\mathbf{X^2}$	P value
SEX				
Male	38	38.24	960.00	0.25
Female	44	44.32		
LYMPHOMA TYPE				
Hodgkin's lymphoma	4	43.25	149.00	0.90
Non-Hodgkin's lymphoma	78	41.41		
SITE				
Nodal	67	40.17	591.50	0.29

Extra-nodal	15	47.43		

Fig.:3

DISCUSSION

The incidence (3.9%) of head and neck lymphomas, predominantly NHL, among all oro-facial and head &neck lesions in this study, is congruent with the submission that head and neck lesions lymphomas are rare, or are under-reported as a result of frequent absence of significant symptoms in this region or the subtle nature of lymph node enlargement.[7,8] The age distribution of participants ranged widely from 12 to 85 years, with a mean age of 43.88 years, indicating that lymphoma affects a broad age spectrum, though middle-aged individuals were most represented in this study. The slight predominance of female participants (53.70%) contrasts with some literature suggesting male dominance in lymphoma incidence[5,9,12,13], and may reflect regional or referral biases. Studies had documented an increasing trend of lymphomas (HL & NHL) among the females[2,14], children and the elderly individuals concurring with the outcome of this study[2]. The duration of lesions varied significantly, with a median of 24 weeks and a mean of 65.72 weeks, suggesting that while most cases are diagnosed within a few months, a subset of patients experience prolonged disease courses, probably due to delayed presentation, diagnosis or the burden related with the out-of-pocket payment system due to poorly implemented health insurance scheme in the national health insurance settings. Prolonged disease course can also be attributable to the natural slow progression of the disease, and such Lymphomas are described as indolent. Lymphomas presenting with vague symptoms and nonspecific signs had been documented to make early diagnosis at times difficult, this also may be responsible for the long period seen among the study patients[4,13].

Nodal involvement was predominant, accounting for 81.7% of cases, with cervical lymph nodes comprising nearly all nodal presentations (98.51%). This aligns with established patterns in lymphoma, where cervical lymphadenopathy is a common initial finding[1,12,15]. Extra-nodal involvement was less frequent (18.3%), with the oral cavity being the most affected site (66.67%)[13]. These findings in this study also underscore the importance of thorough head and neck examinations in suspected lymphoma cases, particularly in most patients and dental settings where extra-nodal lesions may be overlooked.

Non-Hodgkin's lymphoma (NHL) was overwhelmingly more common than Hodgkin's lymphoma (HL), consistent with global epidemiological data[2]. Diffuse small cell lymphoma was the most prevalent subtype (41.5%), followed by diffuse mixed cell lymphoma (34.1%). The incidence of NHL has increased rapidly in the past decades.[2] NHL ranked as the 11th most commonly

diagnosed cancer. The advent of novel targeted therapies, prognosis in NHL has significantly improved over the past few decades[2,9], with survival rates exceeding 80% in high-income countries[2,12,16]. However, high mortality rate from this disease condition had been documented globally including North Africa (ASR, 3.7 per 100,000 people)[9]. Among the few cases tested, 80% were of B-cell origin, reinforcing the predominance of B-cell lymphomas in this population.

Diffuse small cell (lymphocytic) lymphomaaccounts for approximately half of all B-cell lymphomas and the indolent behavior of the small lymphocytic B-cell lymphomas (SLL) is reflected by a clinical course that is usually protracted[17,18]. SLL is an aging-associated disease, with no apparent plateau in adjusted incidence rates by age,

HL is rare, few cases were diagnosed in this study, compared to the NHL concurring with previously established fact about HL.[19] HL also is uncommon especially among young children ages 0-5years and gradually increases among adolescents to the adults[20]. HL has a bimodal age distribution, with an early peak among young adults (aged 20–24 years) and a second, smaller peak among older adults (aged 80–84 years)[17,18]

The limited use of immunohistochemistry (performed in only 6.09% of cases) is notable in this study, and was incurred by a resource-limited healthcare setting. However, molecular profiling is increasingly essential for accurate classification (immuno-phenotyping) and targeted therapy. No statistically significant relationships were found between age and lesion duration, sex and lymphoma type, or between lymphoma type and site of involvement. Although females, patients with Hodgkin's lymphoma, and those with extra-nodal lesions tended to have longer lesion durations, these differences were not statistically significant. These trends may probably be due to the underlying biological or healthcare access factors which may warrant further exploration in larger cohorts.

The predominance of nodal lesions, particularly in the cervical region, and the high frequency of NHL emphasize the need for clinicians to maintain a high index of suspicion when evaluating persistent lymphadenopathy.[20,21] The variability in lesion duration and the underutilization of immunohistochemistry highlights potential gaps in diagnostic efficiency and resource availability. Enhancing access to molecular diagnostics and promoting early recognition of atypical presentations could improve outcomes.

CONCLUSION

Head and Neck Lymphoma is of almost equal gender predilection, slightly more predominant in females and typically affect middle-aged individuals. HL is rare, less common in the study and NHL is more predominant. Of all NHL, Small lymphocytic B cell lymphomas (SLL) is more prevalent in the study. There is no significant relationship between, gender, duration of lesion and the site or type of lymphoma in the head and neck.

Limitations

The retrospective nature of the study and reliance on existing records may have introduced selection and documentation biases. The small number of HL cases and limited immunohistochemical data restrict the generalizability of some findings. Future prospective studies with broader diagnostic tools and larger sample sizes are recommended.

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