

The Pathological Features Of Lymph Node Biopsies From The Niger Delta Region of Nigeria

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Abstract

Aims:

Highlighting the types of lymph node disorders in the Niger Delta region of Nigeria and the pattern of gender and age group distribution.

Materials and methods:

Hematoxylin and eosin stained-slides of lymph node biopsies diagnosed in Anatomical Pathology department, University of Port Harcourt Teaching Hospital for 5 years were archived and studied. Lymph nodes accompanying malignant tissues were noted and the slides of the primary lesions and those secondary to lymph nodes were compared for morphologic consistency. The request forms were also analyzed for age, sex, site of lesion and clinical diagnosis.

Results:

Male: female ratio was 1:1.2. Mean age and range were 29.6 years + 24.1 and 11 months to 80 years respectively. Peak age was 20-39 years. Non-neoplastic lesions with 50.2% were marginally higher than neoplastic ones. The 2 commonest non-neoplastic lesions were non-specific reactive hyperplasia (RH) and tuberculosis (TB) with 22.4% and 16.9% respectively. Metastatic lesions with 59.2% were the commonest cause of lymph node enlargement. Lymphoid malignancies occurred in 40.7%. Cervical lymph node group was the most frequently biopsied.

Conclusion

- Malignant lesions, reactive hyperplasia and tuberculosis were the commonest pathologies of enlarged lymph nodes. Malignant lesions especially metastasis should therefore be considered in lymphadenopathies presenting in the Niger Delta region of Nigeria and biopsy of all cases should be encouraged.*
- Provision of immunohistochemistry and other molecular pathology resources in our centre will obviate limitations in pathological studies.*

Key words:- Lymph node, malignancy, metastasis, Niger Delta, Nigeria

Introduction

Lymph nodes are the most widely distributed and easily accessible components of the lymphoreticular system of the body. Direct and indirect lymph node diseases often present as

enlargement of the lymph nodes which are frequently biopsied and examined. The findings of such biopsies are invaluable in the **diagnosis, staging,** treatment and prognostification of the disorders^{1 2}.

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Various studies have been carried out on the pathology of the lymphoreticular system generally and lymph nodes specifically in the western world ³, Africa ⁴⁻⁷ and Nigeria ⁸⁻²⁰. Although the published reports of these studies show preponderance of non-neoplastic over neoplastic diseases, ³⁻¹⁷ the composition of the non-neoplastic diseases particularly the commonest lesion have been inconsistent. For some studies it is tuberculosis ^{10,11,12,17,18,16} while for others it is non-specific reactive hyperplasia ^{3,8,13}. In the United States, non-specific reactive hyperplasia is the premier cause of lymphadenopathy ³.

Malignant lesions of lymph nodes have been reported as primary lymphoid tumors and metastatic tumors with variable occurrence rates ³⁻²⁰.

Topographically, the cervical group of lymph nodes is the most frequently biopsied group in different studies. ^{3, 4, 10, 12,13,15,20}.

This paper attempts to study the histological patterns of lymph node diseases seen among patients presenting with lymphadenopathy in the Niger Delta region of Nigeria. It is aimed at highlighting the types of diseases seen and their pattern of distribution between sexes and among the various age groups.

Materials and methods:

The in-coming tissue registers of the Anatomical Pathology department, University of Port Harcourt Teaching Hospital (UPTH) were retrospectively scrutinized for lymph node biopsies recorded between January 2006 and December 2010.

Table 1.

Merged sex and age group distribution of non-neoplastic lymph node lesions

Diagnosis	Sex			Age Group										Total
	Male	Female	Unknown age	0-9 yrs	10-19 yrs	20-29 yrs	30-39 yrs	40-49 yrs	50-59 yrs	60-69 yrs	70-79 yrs	80 yrs above		
1 Reactive hyperplasia	24	29	10	10	4	7	6	2	8	2	2	2	53	
2 Tuberculosis	18	22	7	1	7	16	5	1	1	2	-	-	40	
3 Chronic non-specific adenitis	6	6	2	1	2	3	-	3	-	1	-	-	12	
4 Sinus histiocytosis	5	-	-	3	2	-	-	-	-	-	-	-	5	
5 Acute adenitis	1	3	1	1	-	1	1	-	-	-	-	-	4	
6 Dermato pathic	-	1	2	2	1	-	-	-	-	-	-	-	3	
7 Lympho-granuloma	1	-	1	-	-	-	-	-	-	-	-	-	1	
8 Hidradenitis	-	1	1	-	-	-	-	-	-	-	-	-	1	
Total	56	63	24	17	15	27	12	6	9	5	2	2	119	

Table 2.

SEX AND AGE GROUP DISTRIBUTION OF MALIGNANT LYMPH NODE LESIONS.

Diagnosis	SEX		AGE GROUP											Total
	Male	Female	Un- known age	0-9 yrs	10-19 yrs	20-29 yrs	30-39 yrs	40-49 yrs	50-59 yrs	60-69 yrs	70-79 yrs	80 & above		
1 Undefined metastases	12	29	12	-	2	1	5	6	4	10	1	-	41	
2 Prostate carcinoma metastasis	1	-	-	-	-	-	-	-	-	1	-	-	1	
3 Breast carcinoma metastases	-	8	1	-	-	1	1	1	3	1	-	-	8	
4 Nephroblastoma metastases	-	3	-	1	1	1	-	-	-	-	-	-	3	
5 Rhabdomyosarcoma metastases	1	3	1	-	-	-	1	-	1	-	-	-	4	
6 Nasopharyngeal carcinoma metastases	1	-	-	-	-	-	-	-	-	1	-	-	1	
7 Thyroid carcinoma metastasis	-	1	-	-	-	-	-	-	-	1	-	-	1	
8 Colonic carcinoma metastasis	-	1	-	-	-	-	1	-	-	-	-	-	1	
9 Angiosarcoma metastasis	1	-	-	-	-	-	1	-	-	-	-	-	1	
10 Carcinoid tumour metastasis	-	1	-	-	-	-	-	-	-	-	1	-	1	
11 Squamous cell carcinoma metastases	3	1	-	-	2	-	-	-	-	1	1	-	4	
12 Melanoma metastases	2	1	1	1	-	-	-	-	-	-	1	-	3	
13 Liver cell carcinoma metastasis	1	-	-	-	-	-	-	-	1	-	-	-	1	
14 Non-Hodgkin Lymphoma	22	9	5	2	0	3	1	1	9	7	3	-	31	
15 Hodgkin Lymphoma	7	7	2	-	3	5	3	-	-	1	-	-	14	
16 Burkitts Lymphoma	3	-	3	-	-	-	-	-	-	-	-	-	3	

The haematoxylin and eosin-stained slides of all cases identified were archived and studied. Also the request forms were analyzed for patients' age, sex, diagnosis and specific site of the lymph node tissue. Lymph nodes that accompanied malignant lesions were noted and compared histologically with the lesions of the primary tissue. Where necessary new H & E stained slides were made from paraffin embedded tissue block and special stains like Ziehl-Neelson also applied.

UPTH is the premier, referral tertiary health institution in the Niger Delta region of Nigeria. Most inhabitants of this region noted, for its high level of environmental pollution from oil exploration and production, benefit from expert medical services rendered in the center.

Results

Two hundred and thirty seven lymph node biopsies were reviewed. One hundred and thirty cases (54.8%) were from females, while 107 cases (45.2%) were from males, giving a male: female ratio of 1:1.2

The age range of the patients was 11 months to 80 years with mean of 29. +/- 24.1. Age range 20-39 was the peak with 61 cases (25.7%) followed by age range 0-19 with 46 cases (19.4%). Patients of 40-59 and those 60 years and above each separately recorded 42 cases (17.7%).

Non-neoplastic lesions with 119 cases (50.2%) were marginally higher than neoplastic ones with 118 cases (49.8%). The commonest non-neoplastic disorders were non-specific reactive hyperplastic (RH) with 53 cases (22.4%) occurring as 29 cases (54.7%) in females and 24 cases (45.3%) in males, and tuberculosis (TB) with 40 cases (16.9%). Twenty-two cases (55%) of the TB patients were females while 18 cases (45%) were males. The other non-neoplastic lesions were chronic non-specific adenitis, with 6 cases (2.5%), sinus histiocytosis or sinus hyperplasia with 5 cases (2.1%), and acute

adenitis with 4 cases (1.7%). While dermatopathic lymphadenitis occurred in 3 cases (1.3%), Hidradenitis and lymphogranuloma venereum each recorded 1 case (0.4%).

Of the neoplastic lesions, 70 cases (59.3%) were metastatic and occurred as 22 cases (31.4%) in males and 48 cases (68.6%) in females. Primary lymphoid malignancies were recorded in 48 cases (40.7%) consisting of 32 males (66.7%) and 16 females (33.3%). There were 31 cases of Non-Hodgkin lymphoma (NHL) (64.6%) made up of 22 males and 9 females, and 14 cases of Hodgkin lymphoma (HL) (29.2%) made up of 7 males and 7 females. Burkitts lymphoma (BL) with 3 cases (6.3%) was the least type of lymphoid malignancy.

Of the metastatic lesions, Forty-one cases (58.6%) had unconfirmed primary sites, while 29 cases (41.4%) had confirmed primary sites. Of the latter, 8 cases (27.6%) had breast as the source and all occurred in females. Other notable primary sites were rhabdomyosarcoma of skeletal muscle and squamous cell carcinoma of the skin each having 4 cases (5.7%). Melanoma and nephroblastoma were the primary sites in 3 cases (4.3%) each. Prostrate, nasopharyngeal carcinoma, thyroid, colon, liver carcinomas, as well as carcinoid and angiosarcoma each occurred as single case (1.4%).

Metastatic lesions increased with age, occurring least in the first decade with a case and peaking at the 7th decade with 19 cases (27.1%). The mean age of the malignant lesions was 46.5 years.

The site of the lymph node was not indicated in 106 biopsies (44.7%). Of the remaining 131 cases (55.3%) of the biopsies, cervical lymph node with 54 cases (41.2%) ranked highest biopsied site. It was followed by axillary, inguinal and submandibular, with 42 cases (32.1%), 15 cases (11.5%) 6 cases (4.6%) respectively. There were 3 cases (2.3%) of

supraclavicular and 1 case (0.8%) of occipital lymph node biopsies.

Axillary nodes were the commonest nodes involved in metastases with 26 cases (37.1%), followed by cervical node with 9 cases (12.9%). Supraclavicular was the least involved with 1 case (4.2%) of nasopharyngeal carcinoma. The 3 cases of melanocarcinoma were seen in inguinal nodes. Of the 31 cases of NHL, 17 cases (54.8%) were from non-indicated lymph nodes, while 7 cases (22.6%) were diagnosed in biopsies of cervical lymph node and 3 (9.7%) in mesenteric nodes.

Tuberculosis and non-specific reactive hyperplasia predominated among the cervical lymph nodes with 20 cases (37%) and 13 cases (24%) respectively.

Discussion

The male to female ratio of 1:1.2 observed in this study contrasts with the reports of most other researchers where males dominated females ^{7, 10, 11,14,16,17}. Prevalence with sex may be a reflection of the demographic features of the study areas.

Non-neoplastic lesions were marginally more prevalent in this study than neoplastic ones. This is similar to the findings of previous researchers on the subject. ^{8,10,11,14,17}. However, the fact that as much as 49.8% of the biopsies showed malignancies in this study is noteworthy and agrees with the assertion that 40-60% of lymph node biopsies done in referral centers are malignant ²⁵. It is thus pertinent that clinically enlarged lymph nodes ought to be biopsied to increase the odds of detecting possible malignant lesions. Both neoplastic and non-neoplastic lesions occurred more in females than males in this study. It is plausible that this is an indication of improved health awareness and increased access to health care facilities by the women of this region, since demographic figures of the region indicate higher male population.

The 29.5% rate of metastatic lesions in this study is higher than any previous finding in similar researches in Nigeria. Adeniji ¹⁰ in Ilorin

and Ochicha ¹⁶ in Kano separately recorded 19.0% while Pindiga ¹⁵ recorded 19.1% in Maiduguri. This finding is also well beyond the 12.4% recorded by Sibanda and Stanzcuk ⁷ in Zimbabwe and 16.6% by Kasili and Shah ⁵ in Kenya respectively. It is however comparable with the 29% recorded in the United States of America where metastases is second only to reactive hyperplasia ³. This relatively high prevalence of metastatic lesions in the Niger Delta region of Nigeria may be an indication of a relatively high prevalence of malignant lesions among the residents of this region. The United Nations Environment Programme (UNEP) Ogoni land oil pollution investigation report showed chronic exposure of some residents to high levels of the carcinogen-benzene as a result of oil pollution. ²⁹

Among the 29 cases with confirmed primaries, 8 cases (27.6%) were from breast and were all seen in females only. That breast cancer was responsible for the highest number of metastases from known primaries in this study is consistent with the findings in Kano by Ochicha ¹⁶ and is reflective of the very high scourge of breast malignancy currently ²⁴. Seventeen percent (17.3%) of the metastatic lesions were without confirmed primary sites. This is less than the 36.6% and 34.7% reported in Ilorin and Ile-Ife respectively and much less than the anticipation by Kremetz et al in Louisiana that in over half of malignant lymphadenopathies, the primary source is not known.

Metastatic lesions in this study increased with age. This finding is consistent with the existing knowledge that the incidence of malignancies and therefore metastases is higher in advanced ages.

Primary lymphoid malignancies accounted for 20.3%, with NHL, HL & Burkitts in descending order making up 13%, 5.9% and 1.3% respectively. This finding is much higher than the 7% observed in Zimbabwe by Sibanda and Stanzcuk and marginally higher than the 19.1% observed in Maiduguri by Pindiga. However it is less than most other local series, which

ranges between 23%-29%^{10,12,16,17,20}. Like most studies in Nigerian^{9,10,11,12,15} and the West^{26,27} NHL occurred more in this study than HL. Racial and genetic factors have been offered as likely reasons for this disproportionate occurrence of NHL over HL in the West. Comparative studies in the United States of America document higher incidence of NHL among whites than blacks especially for the low-grade lymphomas²⁶. The reason(s) for the predominance of NHL over HL in other previous local studies and ours cannot be adduced readily as the subjects of these studies are all blacks. More epidemiological researches will be helpful in this regard.

Only 3 cases of BL were seen in this study. The low prevalence is similar to the findings of other local studies^{10,12,14} and is consistent with the literature documentation that BL is a common childhood disease, which uncommonly involves lymph nodes². Forty-five percent of the primary lymphoid tumors occurred in economically productive adults with age range 20-59. This adult age predilection has dire economic consequences.

Non-specific reactive hyperplasia (RH) accounted for 22.3% of biopsies. While this finding is at variance with those of most local studies^{10,12,16,17,20}, it is similar to few others^{8,13}. It is also consistent with Adedeji's opinion that the variations in RH is connected with habits, cultures and practices in the various locales, where tattooing, bare foot walking, scarifications, tribal markings etc are common practices in different parts of Africa. These procedures undoubtedly produce reactive changes in the regional lymph nodes draining the affected areas. In the USA, RH is the premier cause of lymphadenopathy, comprising nearly half of the cases³. The relative absence of tuberculosis and earlier diagnosis of malignancies before the onset of nodal metastases may explain the prominence of RH in the USA. The occurrence of RH in this study increased with age, probably is due to the fact that children with less developed immune system are more prone to infectious and non-infectious causes of reactive

lymphadenopathy than adults whose immune system is more developed and adapted to stimulants of hyperplasia.

The site most noted in RH is the cervical group of lymph nodes. This finding contrasts with the inguinal lymph node group noted in most other studies^{10,11,12,17}.

TB with 14.7% constituted the 3rd commonest cause of lymphadenopathy. This finding is similar to some previous studies^{10,11,12,17,18,16}. Preponderance of females in TB which has also been reported by other researches^{5,10} is probably due to an inherent low resistance against the diseases in females⁵ and early exposure of female African children to the Tubercle bacilli in the course of sweeping, hawking or assisting their mothers trading in crowded markets with poor environmental sanitation¹⁰. This finding is also of public health importance in the tropics where mothers breast-feed their babies¹⁰. The 10-29 years peak age of TB in this study is consistent with findings of a study in Kano¹⁶. TB is an AIDS defining illness²⁸. So the high prevalence among patients of first 3 decades may be an indication of high prevalence of HIV infection in the first 3 decades of life in this region. Thirty seven percent of cervical lymphadenopathies were due to TB in this study. This is consistent with most other reports on the common occurrence of TB in cervical lymph node group^{5,11,13,17,18,19}.

This study was carried out using routine hematoxylin and eosin as well as Ziehl-Neelson stains. These are grossly inadequate for thorough lymph node study. Augmentation with immunohistochemical stains and cytogenetic studies would have been more reliable and result orienting.

Conclusion:

- Malignant lesions, reactive hyperplasia and tuberculosis were the commonest pathologies of enlarged lymph nodes in this study. Thus malignant lesions especially metastases should be considered in lymphadenopathies presenting in the Niger Delta region of Nigeria and biopsy of all cases should be encouraged.

- Provision of immunohistochemistry and other molecular pathology resources in our centre will obviate limitations in pathological studies.

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