

Original research article

## Histopathological and cytological Evaluation of Lymphadenopathy

Dr. Naresh

Assistant Professor, Department of Pathology, Prathima Relief Institute of Medical Sciences (PRIMS), Mulugu Rd, Powers Colony, Warangal, Telangana 506007

Corresponding Author: Dr. Naresh

### Abstract

**Background:** Lymphadenopathy is a common clinical presentation in patients visiting the outpatient department. The etiology ranges widely, from inflammatory to malignant reasons at either end of the spectrum. The current study sought to determine the prevalence and proportion of different lymph node lesions in relation to patient age and sex. In cases where both histology and cytology were available, it also connected the histo-cytopathology and contrasted the findings of the current investigation with those of comparable studies.

**Methods:** This study was carried out in the department of pathology, Consecutive samples of lymph nodes received were included. The lymph node samples were from the neck, axilla, and groin, from the extremities, and internal (mediastinal, abdominal, and retroperitoneal) lymph nodes. In most of the cases, hematoxylin and eosin (H & E) stains, special stains like Ziehl-Neelsen stain and Giemsa stain were done wherever needed.

**Results:** A total of n=100 cases of lymph nodes were included out of which 46% were reactive etiology, 12% were tuberculous lymphadenitis, and malignancy included 39% constituted both primary and secondary malignancy. 3% of cases were with inconclusive diagnoses. There were 7% cases of primary malignancy and 32% cases of metastatic deposits. And 3% were inconclusive. The maximum number of females 20% were from the 4<sup>th</sup> decade followed by 18% in the 5<sup>th</sup> decade.

**Conclusion:** More than 50% of instances of lymphadenopathy, which is a frequent clinical manifestation, are benign. Males were less likely to be impacted than females. The ratio of female to male participants in this research was 1.9:1. The fact that tuberculosis is more prevalent in younger age groups justifies the requirement for a specific management and treatment strategy. In the older age range, metastases, in particular adenocarcinomatous deposits, are more prevalent.

**Keywords:** Lymph node, Histopathology, Reactive hyperplasia

### Introduction

One important anatomical part of the immune system is the lymph node [1, 2]. In key places, lymph nodes form small groups or chains where they drain the lymphatic vessels of diverse anatomical areas. The drainage process includes both the identification and processing of antigens in addition to the mechanical filtration of lymph-borne foreign substances. While they are lacking in neonates, peripheral nodes are more common in younger people than in older people [3]. A connective tissue capsule surrounds the lymph node, which is made up of an inner medulla and an outer cortical portion. B zones, which are linked to humoral forms of immune responses, are represented by both the brain and the medulla [4]. Most T-cells are found in the paracortex [5]. Most T-cells are found in the paracortex [5]. The cortex's follicles have different appearances according to how active they are. Secondary follicles arise after antigenic stimulation and are distinguished by the presence of germinal centers, whereas primary follicles appear as spherical lymphocyte aggregates [6]. Filtration of lymph and

antigen processing are the two main jobs of lymph nodes. The lymph nodes, spleen, and mucosa-associated lymphoid tissues (MALT) are all components of the integrated lymphoid system, which is where the immune response occurs [7]. Depending on the location, a node's size might have some pathological importance associated with it. For instance, a lymph node larger than 1 cm in the cervical and axillary areas is regarded as important, whereas even a node as tiny as 0.5 cm becomes significant in the epitrochlear area. On the other hand, a node in the inguinal area must be larger than 1.5 cm to be deemed abnormal [8]. The prevalent observation of superficial lymphadenopathy might be caused by lymphoma, metastatic cancer, or inflammation [9]. Rarely are lymph nodes under 1 cm in size cancerous [10]. The most frequent location for metastatic malignancy is lymph nodes, which might occasionally be the first clinical sign of disease [11, 12]. In situations of widespread lymphadenopathy, axillary and cervical lymph nodes are more likely to provide useful information. It is best to avoid inguinal lymph nodes whenever feasible because of the high frequency of chronic inflammatory and fibrotic alterations they frequently exhibit. A deeper node of the same group may have diagnostic characteristics, but small superficial nodes may just exhibit non-specific hyperplasia [6]. The majority of swollen lymph nodes are not cancerous and are a response to countless different antigens. Neoplasia of lymph nodes is uncommon in routine medical practice, occurring in only 1.1% of biopsies, although it can occur up to 60% of the time at referral centers [13, 14]. The objective of this research was to compare the histocytodiagnosis in instances where both histology and cytology were available, as well as the prevalence of neoplastic and non-neoplastic diseases of the lymph nodes according to age group and sex. This study is significant because enlarged lymph nodes are evaluated using FNAC results as a main diagnostic technique, which helps with the early detection of the disease. At the primary healthcare level, this may be of the highest importance. Lymph node biopsy aids in circumstances when FNAC cannot be used to make a diagnosis and is crucial in the classification of lymphoma [15].

### **Material and Methods**

This cross-sectional study was done in the Department of Pathology. Institutional ethical approval was obtained for the study. Consecutive samples of histopathology of salivary glands received at the department of pathology during the study period were included. The requisition forms contained clinical details that were documented. Lymph node excision biopsy samples were received in 10% formalin. The inclusion of the greatest number of patients with both cytological and histological evaluation was considered. Age, sex, the location and length of the enlarged lymph node, a history of fever, and weight loss were recorded. The cases in which more than one set of enlarged lymph nodes occurred were included under the location of the excision biopsy. The research omitted patients who returned with a recurrence of enlarged lymph nodes (defaulters in TB) and counted them as a single instance. To avoid any observer bias, all pertinent information was given during the assessment of the excision biopsy specimens, except the cytological diagnosis. Gross findings included size, color, consistency, and cut section (an excision biopsy). Special stains like Zeihl Neelsen and Giemsa stains were applied wherever needed.

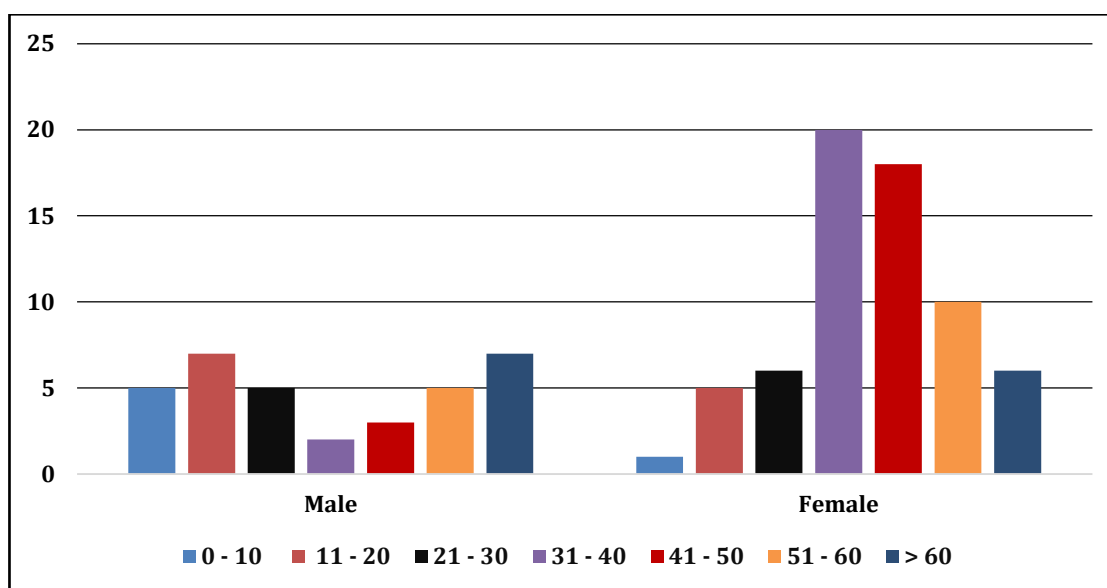
Statistical analysis: The results were recorded on an MS Excel spreadsheet and analyzed by SPSS version 19 in windows format. The continuous variables were represented as a percentage, mean and standard deviation. The categorical variables were represented by p values.

## Results

A total of n=100 cases of lymph nodes were included out of which 46% were reactive etiology, 12% were tuberculous lymphadenitis, malignancy included 39% constituted both primary and secondary malignancy. 3% of cases were with inconclusive diagnoses. There were 7% cases of primary malignancy and 32% cases of metastatic deposits. And 3% were inconclusive. The maximum number of females 20% were from the 4<sup>th</sup> decade followed by 18% in the 5<sup>th</sup> decade. The maximum number of males was 7% from the 2<sup>nd</sup> decade and above 60 years and 5% of cases belonged to the 3<sup>rd</sup> decade depicted in Figure 1.

**Table 1: Histopathological diagnosis in lymph node cases.**

<i>Lesion</i>		<i>Frequency</i>	<i>Percentage</i>	<i>Total</i>
<i>Non-neoplastic</i>	<i>Reactive</i>	<b>46</b>	<b>46%</b>	<b>58</b>
	<i>Tuberculosis</i>	<b>12</b>	<b>12%</b>	
<i>Primary malignancy</i>		<b>7</b>	<b>7%</b>	<b>39</b>
<i>Metastatic</i>		<b>32</b>	<b>32%</b>	
<i>Inconclusive</i>		<b>3</b>	<b>3%</b>	<b>3</b>
<i>Total</i>		<b>100</b>	<b>100</b>	<b>100</b>



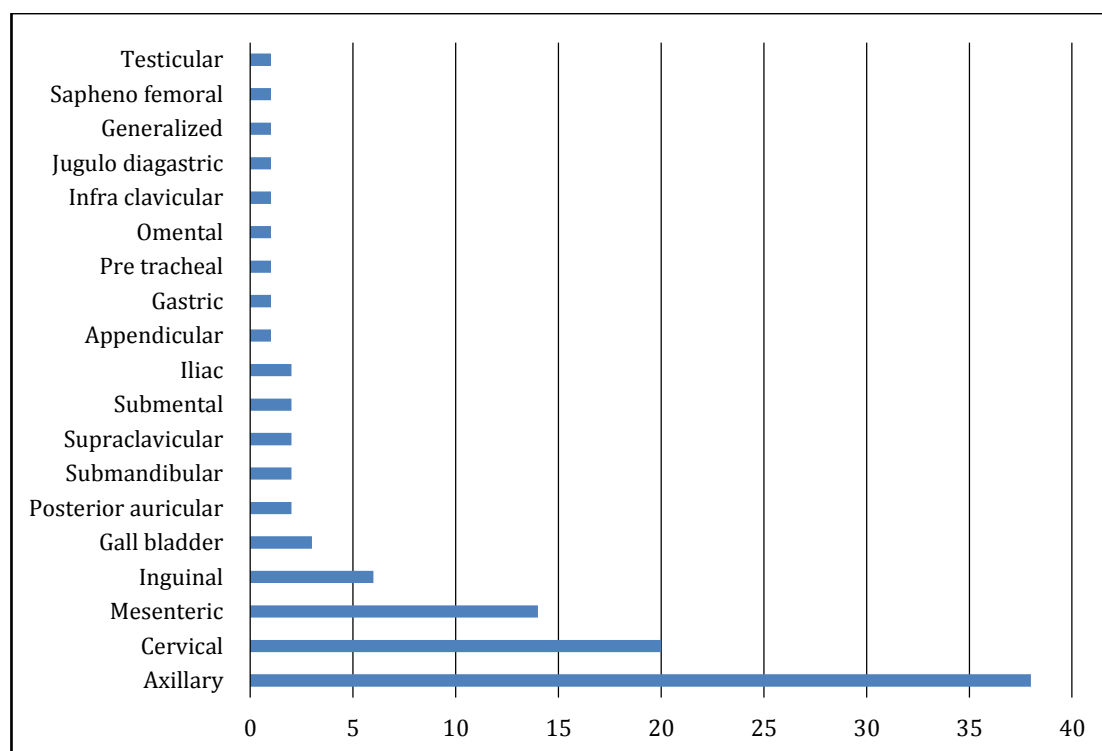
**Figure 1: Age and sex-wise distribution of the cases included in the study.**

On cytological analysis, all 32 instances were identified as reactive on histological examination. In cases of lymphoma, 2 cases were found benign on cytological examination and in cases of metastatic malignancy, one case was benign on a cytological examination given in table 2.

**Table 2: Histopathological and cytological correlation between the samples in the study**

<i>Histopathological diagnosis and number of cases</i>		<i>Cytological diagnosis</i>				
		<i>Reactive</i>	<i>Tubercular</i>	<i>Lymphoma</i>	<i>Met (Adeno)</i>	<i>Met (SCC)</i>
<i>Reactive</i>	<b>32</b>	<b>32</b>	<b>00</b>	<b>00</b>	<b>00</b>	<b>00</b>

<b><i>Tuberculosis</i></b>	<b>12</b>	<b>00</b>	<b>12</b>	<b>00</b>	<b>00</b>	<b>00</b>
<b><i>Lymphoma</i></b>	<b>07</b>	<b>01</b>	<b>01</b>	<b>05</b>	<b>00</b>	<b>00</b>
<b><i>Met (Adeno)</i></b>	<b>04</b>	<b>01</b>	<b>00</b>	<b>00</b>	<b>00</b>	<b>03</b>
<b><i>Met (SCC)</i></b>	<b>06</b>	<b>00</b>	<b>00</b>	<b>00</b>	<b>06</b>	<b>00</b>
<b><i>Total</i></b>	<b>61</b>	<b>34</b>	<b>13</b>	<b>05</b>	<b>06</b>	<b>03</b>



**Figure 2: Showing the anatomical distribution of lymph nodes included in the study.**

## Discussion

This cross-sectional study included 100 cases of lymphadenopathy samples that were sent to the pathology department for investigation. The data from histopathology and cytology were collated, examined, and contrasted with those from previous investigations. There were 34% male and 66% female cases out of a total of 100 cases, showing a female preponderance with a female-to-male ratio of 1.9:1. Patients' ages ranged from 8 to 68 years old. While Shrestha et al., [16] observed a female-to-male sex ratio of 1.04:1 Similarly, indicating female preponderance. Dandapat et al., [17] had a ratio of 1.2:1 in research of a comparable kind. A ratio of 1.5:1 was reported in the research by Lee B et al., [18]. Age varied from 8 to 68 years in the current research, with a mean of 43.5 years. The age range of Dandapat et al., [17] findings were 1-65 years, with a mean of 33 years. Out of n=100 instances of lymph nodes in our study, 58% of cases were deemed benign, 39% cases were deemed malignant, and 3% cases were deemed insufficient. 46% of benign cases were reactive, and 12 had tubercular etiology. Reactive hyperplasia was shown to be the most frequent cause of lymph node enlargement in all trials.

According to Zahir et al., [19] reactive hyperplasia was the most frequent cause of enlarged lymph nodes, followed by malignancy and infectious diseases. According to Thomas et al.,

[20], reactive hyperplasia was the most frequent etiology, followed by granulomatous pathology and then cancer. Out of 200 instances, the axillary lymph node was most frequently affected in 77 cases (38.5%), followed by 39 cases (19.5%), 28 cases (14%) of mesenteric lymph nodes, and 13 cases (13%) of the inguinal lymph node. The axillary lymph node was the most often affected, which was consistent with earlier research by Ojo et al., [21] and Lee B et al., [18]. In the current investigation, axillary lymph node enlargement was most frequently caused by metastatic deposits. In the current investigation, neoplastic lesions representing both primary and metastatic cancer were observed in 39.5% of the patients. 20% of the cases in research by Shaikh et al., [22] had a neoplastic origin. 20% of the patients in Olu-Eddo et al., [23] had a neoplastic origin. The outcome of the current study was examined and contrasted with those of previous investigations. The principal cancer of lymph nodes is Hodgkin's and Non-Hodgkin's lymphoma. Thomas Hodgkin first defined Hodgkin's lymphoma in 1832 [24]; this form is characterized by the presence of Reed-Sternberg cells. Due to its varied cellularity, classical Hodgkin lymphoma might mimic other reactive lymphadenopathies and other lymphomas [25, 26]. Classical Hodgkin lymphoma patients with a high granulocyte count might mimic anaplastic large-cell lymphoma or suppurative lymphadenitis [27]. Cases with a high histiocyte count might mimic granulomatous diseases. The presence of Reed-Sternberg-like cells in non-Hodgkin lymphomas and several reactive lymphadenopathies, including infectious mononucleosis, might make a diagnosis challenging [28]. Cases of large B-cell lymphoma or anaplastic large-cell lymphoma can mimic cases of classical Hodgkin lymphoma with many neoplastic cells, such as the syncytial form of nodular sclerosis type. In 61 cases, cytology was available for correlation. The current study was compared to Dhingra et al., [29]. Out of the cases with cytology available 3 cases had histology results indicating they were malignant the accuracy of diagnosis of benign lesions was 90.5% According to Dhingra, et al., [29] of the 80 cases that were diagnosed as benign on cytology examinations later turned out to be malignant, providing an accuracy of +2%. According to Hirachand, out of 48 instances that tested benign on cytology, 45 cases tested benign on histology, yielding an accuracy of +6%. On cytological inspection, 34 patients in the current research revealed non-specific lymphadenitis.

### Conclusion

More than 50% of instances of lymphadenopathy, which is a frequent clinical manifestation, are benign. Males were less likely to be impacted than females. The ratio of female to male participants in this research was 1.9:1. The fact that tuberculosis is more prevalent in younger age groups justifies the requirement for a specific management and treatment strategy. In the older age range, metastases, in particular adenocarcinomatous deposits, are more prevalent. In many circumstances, a simple histopathological or cytological study of the lymph nodes might aid in the clinical diagnosis.

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