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CYTOMORPHOLOGICAL SPECTRUM OF ENLARGED SUPRACLAVICULAR LYMPH NODE USING FINE NEEDLE ASPIRATION CYTOLOGY (FNAC): A DESCRIPTIVE OBSERVATIONAL STUDY AT SMS MEDICAL COLLEGE & ATTACHED GROUPS OF HOSPITAL, JAIPUR (RAJASTHAN)

Pathology

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ABSTRACT

Background & objectives: Enlargement of supraclavicular lymph nodes may be the only site of disease. However most nodal disease is related to abnormalities in the organ associated with the abnormal node. Supraclavicular lymphadenopathy is a common manifestation of many diseases. The differential diagnosis of supraclavicular lymphadenopathy is extensive including neoplastic, infective, inflammatory, reactive and non-diagnostic; therefore, enlargement of supraclavicular lymph node is a diagnostic challenge. Fine Needle Aspiration Cytology (FNAC) of these enlarged lymph nodes is a simple and very useful screening test which can provide an early clue to the diagnosis. This study intends to find out systematically the various pathological conditions presenting with enlarged supraclavicular lymph nodes. **Methods:** Consists of enlarged supraclavicular lymph node FNAC of 230 patients referred to Department of Pathology at SMS Medical College, Jaipur (Rajasthan) from January 2021 to August 2022. **Results:** In this study non-neoplastic lesions (67.39%) were more than neoplastic lesions (32.61%). Most common neoplastic lesions were metastatic. Among neoplastic lesions, metastatic malignant epithelial neoplasm was more common with 37 (50.66%) cases followed by metastatic squamous cell carcinoma, metastatic poorly differentiated, metastatic adenocarcinoma and lymphoproliferative lesions with 13 (17.33%), 11 (14.66%) 7 (9.33%) and 6 (8.00%) cases respectively. In non-neoplastic lesions, tubercular lesions were more common with 103 (66.45%) cases followed by non-tubercular and reactive lesions with 35 (22.58%) and 17 (10.96%) cases respectively. **Interpretation & conclusion:** From this study it is discernible that enlargement of supraclavicular lymph nodes is frequently by tubercular lymphadenopathy followed by neoplastic lymphadenopathy (metastatic). The spectrum of various diseases in supraclavicular lymphadenopathy in relation with different parameters is well documented. This study will facilitate pathological reporting and aid clinicians to make focused investigation and plan appropriate treatment.

KEYWORDS

Fine Needle Aspiration Cytology, Lymphadenopathy, Neoplastic, Non-neoplastic, Supraclavicular lymph node

INTRODUCTION:

Lymphadenopathy is a very common clinical manifestation. It results from a vast array of disease process whose broad spectrum include, Malignancies, Infections, Autoimmune disorders, Miscellaneous and Iatrogenic causes (MIAMI). In general practice < 1% of patients with palpable lymphadenopathy have a malignant process[1]. Lymphadenopathy is defined as an abnormality in the size or character of lymph nodes, caused by the invasion or propagation of either inflammatory cells or neoplastic cells into the node.

Supraclavicular lymphadenopathy is a common manifestation of many diseases and may be the only site of disease. The differential diagnosis of supraclavicular lymphadenopathy is extensive including neoplastic, infective, inflammatory, reactive and non-diagnostic[2,3], therefore enlargement of supraclavicular lymph node is a diagnostic challenge.

In many studies, metastatic malignancies were found to be a major cause of supraclavicular lymphadenopathy, but in developing countries benign causes like tuberculosis also found in major proportions. Metastatic squamous cell carcinoma with primary in the oral cavity is most often seen[8]. The analysis of supraclavicular lymph node enlargement in the neck is not an easy task and the diagnosis of the condition is a problem and diagnostic challenge because most of the diseases resemble each other. Fine Needle Aspiration Cytology (FNAC) of these enlarged lymph nodes is a very useful screening test which can provide an early clue to the diagnosis.

FNAC is a procedure to obtain cells and tissue fragments through a needle introduce into abnormal tissue and its study. FNAC has been a simple, safe, reliable, and inexpensive method of establishing the diagnosis of lesions and masses in various sites and organs and is the most convenient bedside diagnostic aid[5-8]. FNAC is a minimally invasive technique, therefore it also helps in early direction of appropriate investigations.

This study intends to find out systematically the spectrum of various pathological conditions presenting with enlarged supraclavicular lymph nodes in the neck at tertiary care centre of Rajasthan.

MATERIAL AND METHODS:

Source of sample: Consists of enlarged supraclavicular lymph node FNAC obtained from patients referred to Department of Pathology at SMS Medical College, Jaipur (Rajasthan).

Study area: Department of Pathology, SMS Medical College, Jaipur, Rajasthan.

Study universe: All cases of enlarged supraclavicular lymph node in the Department of Pathology, SMS Medical College, Jaipur.

Study design: Cross sectional study, Descriptive type of Observational study.

Study period: From January 2021 to August 2022.

Sample size: 230

Sampling technique: FNAC of every eligible patient with enlarged supraclavicular lymph node in the Department of Pathology, SMS Medical College, Jaipur.

Inclusion criteria:

1. Patients presenting with supraclavicular cervical lymph node enlargement with consent to participate in study.
2. All FNAC smear having adequate cellularity included in study.

Exclusion criteria:

1. Patients where FNAC of lymph node could not be carried out (non-cooperative patient).
2. FNAC with inadequate sample (having very low cellularity or containing only blood).
3. Poorly preserved specimen, in which material is adequate but the morphology is not discernible.
4. Known case of malignancy.

Study tool: Clinical and cytological.

RESULTS:

In this study of 230 patients with supraclavicular lymphadenopathy, non-neoplastic lesions (67.39%) were more than neoplastic (32.61%) lesions and female were affected more than male. Female were 127 (55.22%) and male were 103 (44.78%). Male to female ratio was 1:1.23.

Table I: Cytomorphological Lesions of Supraclavicular Lymphadenopathy

Cytomorphological Lesions	No. of patients	Percentage
Neoplastic	75	32.61
Non neoplastic	155	67.39
Total	230	100.00

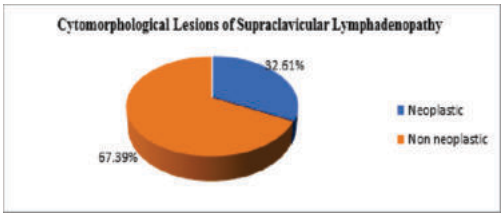
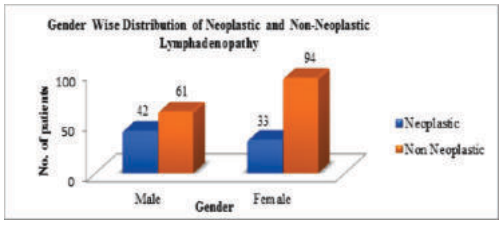


Table II: Gender Wise Distribution of Neoplastic and Non-Neoplastic Lymphadenopathy

Gender	Neoplastic		Non-neoplastic		Total	
	N	%	N	%	N	%
Male	42	56.00	61	39.35	103	44.78
Female	33	44.00	94	60.65	127	55.22
Total	75	100.00	155	100.00	230	100.00

Chi square 5.663, P value 0.017

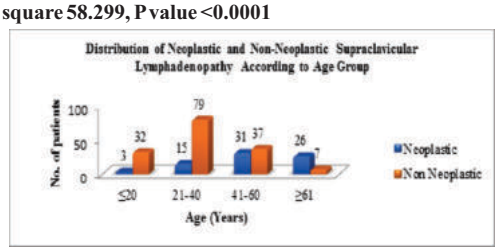


In neoplastic lymphadenopathy 33 (44%) females and 42 (56%) males were affected, male to female ratio was 1.27:1 and in non-neoplastic lymphadenopathy 94 (60.65%) females and 61 (39.35%) males were affected, male to female ratio was 1:1.54. P value was found statistically significant.

Table III: Distribution of Neoplastic and Non-Neoplastic Supraclavicular Lymphadenopathy According to Age Group

Age (years)	Neoplastic		Non-neoplastic		Total	
	N	%	N	%	N	%
≤20	3	4.00	32	20.65	35	15.22
21-40	15	20.00	79	50.97	94	40.87
41-60	31	41.33	37	23.87	68	29.57
≥61	26	34.67	7	4.52	33	14.35
Total	75	100.00	155	100.00	230	100.00

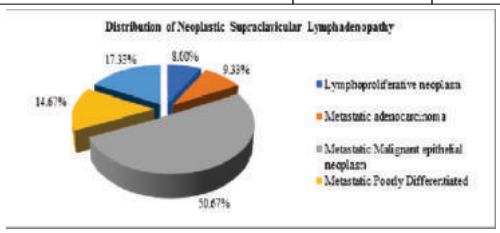
Chi square 58.299, P value <0.0001



The most common age group affected was 41-60 year in neoplastic lymphadenopathy with 31 (41.33%) cases while it was 21-40 year in non-neoplastic lymphadenopathy with 79 (50.97%) cases. P value was found statistically significant.

Table IV: Distribution of Neoplastic Supraclavicular Lymphadenopathy

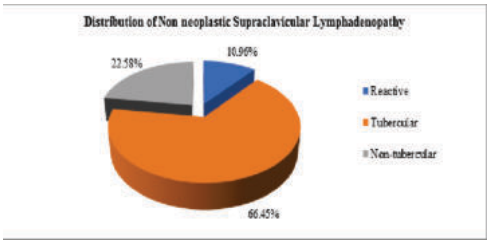
Neoplastic lesion	No. of patients	Percentage
Lymphoproliferative neoplasm	6	8.00
Metastatic adenocarcinoma	7	9.33
Metastatic Malignant epithelial neoplasm	38	50.67
Metastatic Poorly Differentiated	11	14.67
Metastatic squamous cell carcinoma	13	17.33
Total	75	100.00



Among neoplastic lymphadenopathy, most common was metastatic malignant epithelial neoplastic lesions with 37 (50.66%) cases followed by metastatic squamous cell carcinoma, metastatic poorly differentiated, metastatic adenocarcinoma and lymphoma with 13 (17.33%), 11 (14.66%) 7 (9.33%) and 6 (8.00%) cases respectively, while in non-neoplastic lymphadenopathy tubercular lesions were more common with 103 cases followed by non-tubercular and reactive lesions with 35 and 17 cases respectively.

Table V: Distribution of Non neoplastic Supraclavicular Lymphadenopathy

Non neoplastic lesions	No. of patients	Percentage
Reactive	17	10.96
Tubercular	103	66.45
Non-tubercular	35	22.58
Total	155	100.00

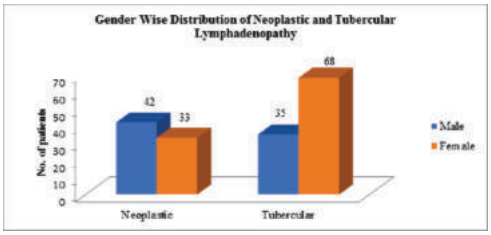


In present study most common non neoplastic lymphadenopathy was tubercular in 103 (66.45) followed by non-tubercular and reactive in 35 (22.58) and 17 (10.96) respectively.

Table VI: Gender Wise Distribution of Neoplastic and Tubercular Lymphadenopathy

Gender	Neoplastic		Tubercular		Total	
	N	%	N	%	N	%
Male	42	56.00	35	33.98	77	43.26
Female	33	44.00	68	66.02	101	56.74
Total	75	100.00	103	100.00	178	100.00

Chi square 8.573, P value 0.003



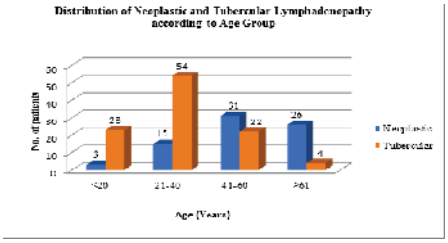
In present study males were affected more than female in neoplastic lymphadenopathy, 42(56.00%) were males and 33(44.00%) were females. While in Non neoplastic lymphadenopathy females were more affected, 68(66.02%) were females and 35(33.98%) were males. P value found statistically significant.

Table VII: Distribution of Neoplastic and Tubercular Lymphadenopathy according to Age Group

Age (years)	Neoplastic		Tubercular		Total	
	N	%	N	%	N	%
≤20	3	4.00	23	22.33	26	14.61
21-40	15	20.00	54	52.43	69	38.76

41-60	31	41.33	22	21.36	53	29.78
≥61	26	34.67	4	3.88	30	16.85
Total	75	100.00	103	100.00	178	100.00

Chi square 51.97, P value <0.0001



In present study, neoplastic lymphadenopathy was most common in age group 41-60 year and minimum in age group 0-20 year. Tubercular lymphadenopathy was most common in age group 21-40 year and minimum in age group ≥ 61 year. P value found statistically significant.

Images:

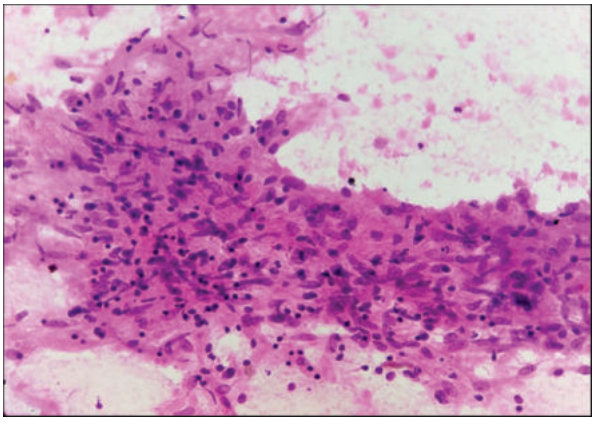


Figure 1: High Power View (H&E Stain)-Granuloma in Tuberculosis-ShowsEpithelioid cell granuloma composed of epithelioid cells, histiocytes and lymphocytes.

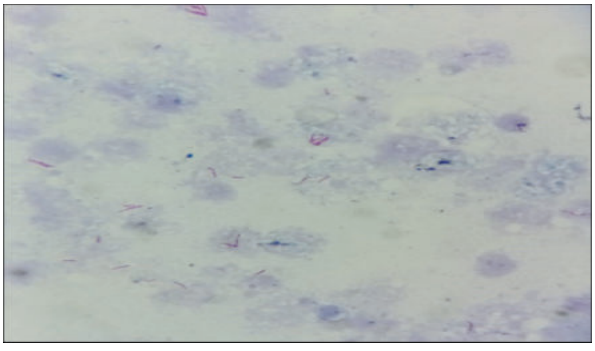


Figure 2: Acid Fast Bacilli Seen in Tuberculosis- Oil immersion view

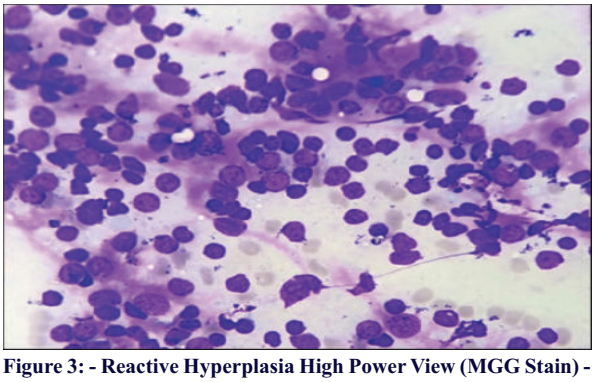


Figure 3: - Reactive Hyperplasia High Power View (MGG Stain) - Shows polymorphous population of lymphoid cells in various stage of development (immunoblasts, centroblast, centrocytes& predominantly small lymphocytes).

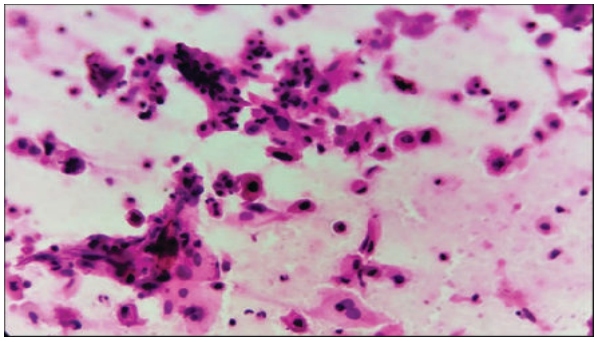


Figure 4: Metastatic Squamous Cell Carcinoma High Power View (H&E Stain)- Shows India ink nuclei with deep organophilic cytoplasm and tadpole cells also seen.

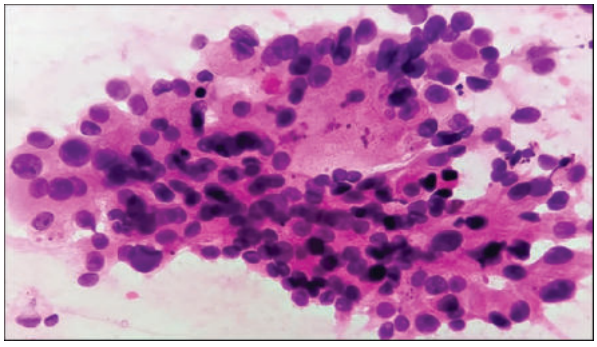


Figure 5: Metastatic Adenocarcinoma High Power View (H&E Stain)-Shows atypical cells arranged in acinar pattern and ring pattern, cells having round to oval nuclei, nuclear overlapping, hyperchromatic nuclei, prominent nucleoli with moderate amount of eosinophilic cytoplasm.

DISCUSSION:

Supraclavicular lymphadenopathy is a common clinical manifestation of many diseases. The differential diagnosis of supraclavicular lymphadenopathy is extensive including neoplastic, infective, inflammatory, reactive and non-diagnostic [2,3], therefore enlargement of supraclavicular lymph node is a problem and diagnostic challenge.

The present study comprised FNAC of 230 cases with supraclavicular lymphadenopathy in department of pathology, SMS medical college Jaipur between time period of January 2021 to August 2022.

In this study of 230 cases with supraclavicular lymphadenopathy, non-neoplastic cases were 155(67.39%) and neoplastic cases was 75(32.61%). In this study, non-neoplastic aetiologies collectively dominated over neoplastic which is comparable with the study conducted by Rashmi et al [14], Sujata et [12] al and Gopinath Barui et al [17], in which benign lesions were more common than malignant lesions, while in Adhikari et al [10] and Gopinath Barui et al [17] showed malignancies cases more.

In this study the finding of non-neoplastic cases is somewhat more as expected in supraclavicular lymphadenopathy. Collectively reactive, non-tubercular (suppurative, inflammatory & abscess) and tubercular lymphadenitis (including granulomatous) was considered non-neoplastic.

In this study overall most common lymphadenopathy was tubercular with 103 (44.78%) followed by neoplastic 75(32.60%), non-tubercular and reactive with 75 (32.61%), 35 (15.22%) and 17 (7.39%) respectively.

In present study most common lymphadenopathy was tuberculosis (44.78%) which is high as compared to the studies by Adhikari et al (41.6%), Gupta N et al [18](13.5%) and Nasuti JF et al[9] (2%). This high incidence of Tuberculosis in west Rajasthan is due to low socioeconomic status, lack of education, close contact due to large families, malnutrition and unhygienic living condition.

Tuberculosis was more prevalent in the 20-40 years of age group with female predominance, 68 (66.02%) females and 35 (33.98%) males

and right side more involved than left in tubercular lymphadenopathy with statistically significant p value. These findings were concordant with the previous studies like Kumar H et al[8], Adhikari et al[10] and Chandanwale SS et al[15] and Rashmi et al[14].

Neoplastic cases were most common in age group 41-60 years with male predominance, 42 (56.00%) males and 43 (44.00%) females and left side more involved than right side with significant P value. These findings were concordant with the previous studies like Rashmi et al [14], Sumitra et al and Laisram et al [11] and Gopinath Barui et al.[17]

In this study, most common neoplastic lymphadenopathy was metastatic malignant epithelial neoplasm in which cytomorphological features were not clear to be categorized. These cases needed histopathology along with IHC for exact categorization of lesion. Most common pattern clearly categorizable on cytology was metastatic squamous cell carcinoma followed by metastatic adenocarcinoma. This is comparable with the study of Sumit Mitra et al [4], Adhikari RC et al [10]while in Laishram et al[11] and Gopinath Barui et al[17] most common adenocarcinoma followed by squamous cell carcinoma.

Comparable with studies by Adhikari et el[10], Mitra et el[4], Rashmi et al[14] and Gopinath Barui et al[17] among the metastatic malignancies the squamous cell carcinoma was the most common metastatic lesion followed by metastatic adenocarcinoma. Although some neoplasm can cause necrosis or degenerative changes like squamous cell carcinoma and can be missed on cytology in the absence of atypical cells.

Lymphoid malignancies were far less common than metastatic malignancies in supraclavicular nodes as shown in several studies [11,13,16]. Supraclavicular nodes are the least common site of involvement by lymphoid malignancies in comparison to other cervical lymph nodes [16] which was comparable with the studies of Adhikari et al[10] and Gopinath et al[17] & Rashmi et al[4].

In present study, neoplastic lymphadenopathy was most common in age group 41-60 year which is comparable with the studies of Sumitmitra et al[4] and Laisram et al[11], Rashmi et al[14] and Gopinath Barui et al.[17]

CONCLUSION:

In the present study non-neoplastic aetiologies collectively dominated over neoplastic aetiologies. In non-neoplastic aetiologies tubercular lymphadenopathy was most common presentation because tuberculosis is more prevalent in this area of India (developing country) due to low socio-economic status, unhygienic living condition, lack of education, close contact due to large families with small living spaces and malnutrition. In non-neoplastic lymphadenopathy cases right side of lymph node more involved and females are more affected.

In neoplastic aetiologies metastatic malignant epithelial neoplasm is most common finding while lymphoproliferative is least common. The extent of neoplasm depends upon presentation of patients at tertiary care centre. In neoplastic left side node more involved due to more extensive drainage from abdomen and thorax with kidney, testis, cervix, pancreas etc.

From this study it is discernible that enlargement of supraclavicular lymph nodes are frequently by tubercular lymphadenopathy followed by neoplastic lymphadenopathy.

The spectrum of various diseases in supraclavicular lymph node in relation with different parameters is well documented. Hence his study will facilitate pathological reporting and aid clinicians to make focused investigation and plan appropriate treatment.

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Conflict of Interest: None

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