www.jmscr.igmpublication.org
Impact Factor (SJIF): 6.379
Index Copernicus Value: 79.54
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossrefDOI: https://dx.doi.org/10.18535/jmscr/v6i9.116

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Original Research Article

Cytomorphological Pattern and Evaluation of Peripheral Lymphadenopathy in a Tertiary Care Center in Kanchipuram: A Descriptive Study

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Abstract
Background: *The aim of the study is to evaluate the cytomorphological pattern and frequency of pathological entities and the role of Fine needle aspiration cytology (FNAC) in the diagnosis of peripheral lymphadenopathies at a tertiary care center in kanchipuram during the period of 18 months (January 2017 to June 2018).*
Methods: *This is a descriptive study including 150 patients who underwent FNAC evaluation of peripheral lymphadenopathy from the period of January 2017 to June 2018. The patients were analysed to determine the age and sex distribution, anatomical distribution and cytodiagnosis, distribution of cytomorphological patterns.*
Results: *Among 150 cases, reactive lymphadenitis was the most common cytomorphological pattern 76/150 (50.66%) followed by granulomatous lymphadenitis (56/150, 37.3%) as the second most common diagnosis. Female cases were more in this study (82, 54.7%) than male (68/150, 45.3%), Reactive lympadenitis was more frequent in males and granulomatous lymphadenitis in female patients. Metastatic deposit was common among male (>60 years). Out of 150 cases cervical lymphnodes (100/150, 66.6%) were most commonly involved, followed by supraclavicular (10.6%), axillary (9.3%), submandibular (6%), inguinal (4.6%) and post auricular (2.6%).*
Conclusion: *FNAC is a simple, minimally invasive, inexpensive and rapid diagnostic tool in the diagnosis of lymphadenopathy. FNAC plays an important role in places where histopathological facilities are not available,in early diagnosis of benign and malignant lesions and also helps in planning early management of lymphadenopthies.*
Keywords: *Lymph node, Fine needle aspiration cytology, Morphological pattern.*

Introduction

Lymphnodes are the glands enclosed in a fibrous capsule and consists of an outer cortex and an inner medulla .In the lymphatic system lymph node is a secondary lymphoid organ[1], and plays a vital role in body immunity. Lymphadenopathy refers to increased size, number, or consistency of the lympnodes and can be localized or generalized.

Lymphadenopathy is one of the common clinical presentation in both pediatric and adult age group. It can be due to varied spectrum of etiologies ranging from benign to malignant .Cervical lymph nodes are more commonly involved than other lymphatic region. In a large number of studies, the most common benign etiologies are non-specific reactive changes in lymph nodes[2]. Fine needle aspiration cytology (FNAC) is simple, minimally invasive, inexpensive and rapid diagnostic tool in diagnosis of lymphadenopathy. Tissue diagnosis by fine needle aspiration biopsy or excisional biopsy is the gold standard evaluation for Lymphadenopathy[3].

Aim

The aim of the study is to evaluate the cytomorphological pattern and frequency of pathological entities and the role of FNAC in diagnosis of peripheral lymphadenopathy at a tertiary care center in kanchipuram**.**

Material & Methods

This is a descriptive study including 150 patients who underwent FNAC evaluation of peripheral lymphadenopathy from the period of January 2017 to June 2018. The patients presented in the clinical Outpatient department with complaints of swelling in various regions, which was later clinically diagnosed as lymphadenopathy and subsequent FNAC was performed in the following lesions. All the FNACs were performed after getting consent, smears were prepared and the slides were routinely stained by hematoxylin and eosin (H&E) for further evaluation. The cases were reported by a single pathologist to avoid inter-observer variation. No biopsy correlation was done as excised lymphnode specimen was not received in majority of the cases.

Statistical analysis

We used Statistical Package for the Social Sciences (SPSS) Software version 21, for the data analysis. Descriptive analysis was computed

Result

In this study, 150 patients with superficial lymph node enlargement were evaluated by fine needle aspiration cytology during the period January 2017 to June 2018. In this study age group was divided into seven groups –(<10) years, (11-20) years , (21-30) years,(31-40) years,(41-50) years,(51-60) years and (>60) years. Majority of the patients with lymphadenopathy were in the age group of(21- 30) years 32/150 cases (21.3%), followed closely by(31-40) years age group 26/150 cases (17.30%) and least in 11-20 years age group 14/150 cases (9.30%) (Table-1). Superficial lymphadenopathy was observed more in female patients 82/150(54%) than male patients 68/150(45.3%) (Table-2). Male to Female ratio in the study was (1:1.20).

Table: 1 Age distribution

Age(yrs)	Frequency	Percentage (%)
<10	19	12.70%
11-20	14	9.30%
21-30	32	21.30%
31-40	26	17.30%
41-50	20	13.30%
51-60	22	14.70%
>60	17	11.30%

Table: 2 Gender distribution

Gender	Frequency	Percentage (%)
MALE	68	45.3
FEMALE	82	54.7
Total	150	100.0

Anatomical distribution

In the present study anatomical distribution was divided into six groups. Involvement of cervical lymphnode is seen in 100/150cases (66.60%), supraclavicular lymph node16/150(10.6%), axillary lymph node 14/150(9.80%), sub-mandibular lymph node 8/150(6%), inguinal lymph node 8/150(4.60%) and post-auricular lymph node 4/150 (2.60%). Figure: 1

In the cervical region of lymph nodes (60/100) cases of reactive hyperplasia, (30/100) cases of granulomatous lymphadenitis,(1/100) case of acute suppurative lymphadenitis , (1/100) case of necrotic lymphadenitis, (3/100)cases of lymphoproliferative disorder and 5 cases of metastatic deposit was diagnosed. In the Supraclavicular region of lymph nodes, (6/16) cases of reactive hyperplasia, (7/16) cases of granulomatous lymphadenitis, (2/16) case

of acute suppurative lymphadenitis , (1/16) cases of metatastic deposit was diagnosed.

In the Axillary region of lymph nodes, (5/14) cases of reactive hyperplasia, (9/14) cases of granulomatous lymphadenitis was diagnosed.

In the Inguinal region of lymph nodes,(3/8) cases of reactive hyperplasia,(3/8)cases of granulomatous lymphadenitis,(1/8) case of acute suppurative lymphadenitis , (1/8) cases of metatastic deposit was diagnosed.

In the Submandibular region of lymph nodes, (6/8) cases of granulomatous lymphadenitis and (2/8) cases of acute suppurative lymphadenitis was diagnosed.

In the Post auricular region of lymph nodes, (2/4) cases of reactive hyperplasia,(1/4)cases of granulomatous lymphadenitis,(1/4) case of acute suppurative lymphadenitis was diagnosed**.** (Table: 3)

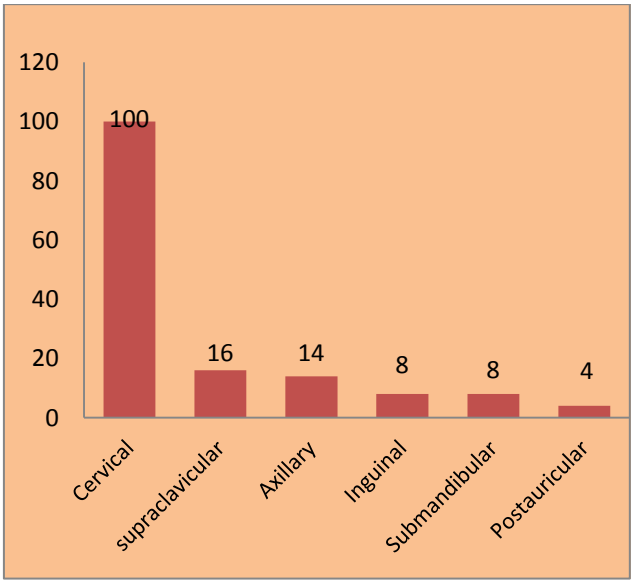

Figure: 1 Anatomical distribution

Distribution of Cytomorphological patterns

Pattern of lesion on cytodiagnosis was divided in to 6 groups: Reactive hyperplasia, Granulomatous lympadenitis, Acute suppurative lymphadenitis, Necrotic lymphadenitis, Lymphoproliferative disorders and metastatic deposit.

Distribution of cytomorphological pattern are shown in (Figure 2).

This study includes 150 cases of lymphadenopathy from January 2017 to June 2018, Reactive hyperplasia was highest among the diagnosis given 76 cases (50.66%), followed by granulomatous lymphadenitis 56 cases (37.33%), Metastatic deposit 7 cases (4.66%), Acute suppurative lymphadenitis 7cases(4.66%)and lymphoproliferative disorder 3 case(0.66%). Diagnosis of reactive hyperplasia was given in the presence of cellular smear with polymorphous population of lymphoid cells and tingible body macrophages. (Figure 3 & 4)

Diagnosis of granulomatous lymphadenitis was given in presence of epithelioid granulomas with or without caseating necrosis. (Figure 5 & 6)

Diagnosis of acute suppurative lymphadenitis was given in the presence of neutrophils in the background of lymphoid cells.

Diagnosis of necrotic lymphadenitis was given in the presence of necrotic material in the aspirate.

Diagnosis of lymphoproliferative disorder was given in the presence of higly cellular smear with monotous uniform population of lymphocytic cells and in the absence of Reed Sternberg cells.

Metastatic deposit in the lymphnode was diagnosed by varied morphological pattern and cellular details.

Papillary carcinoma was diagnosed in the presence of malignant cell clusters in papillary pattern with fibrovascular core and characteristic nuclear features like nuclear grooves and intranuclear cytoplasmic inclusions. (Figure 7 & 8).

Squamous cell carcinoma was diagnosed in the presence of sheets of squamous cell with eosinophilic cytoplasm and hyperchromatic pleomorphic nuclei.(Figure 9 & 10).

Malignant melanoma was diagnosed in the presence of malignant cells in clusters and in singles with intracellular and extracellular melanin pigments. (Figure 11&12).

Adenocarcinoma was diagnosed in the presence of pleomorphic cells with prominent nucleoli and the malignant cells arranged in glandular pattern.

Table 3: Anatomical distribution & cyto-diagnosis (January 2017 to June 2018)

Site	Reactive	Granulomatous	Acute suppurative	Necrotic	Lymphoproliferative	Metastatic
Cervical	60	30	1	1	3	5
Supraclavicular	6	7	2	0	0	1
Axillary	5	9	0	0	0	
Inguinal	3	3	1	0	0	1
Submandibular	0	6	2	0	0	0
Postauricular	2	1	1	0	0	0

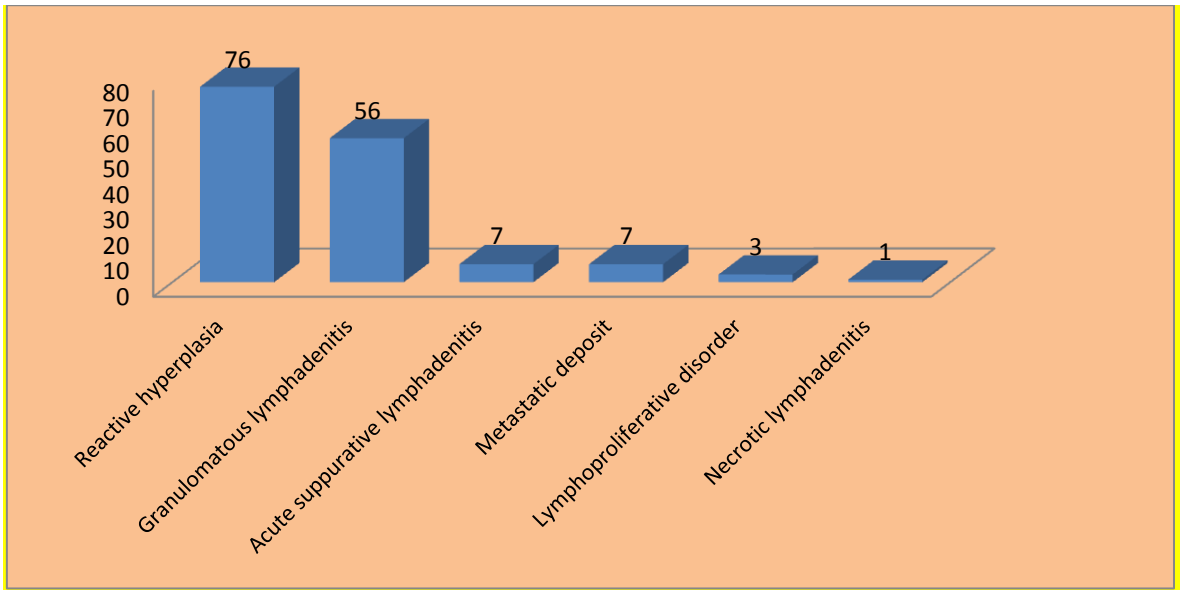

Figure: 2 Distribution of cytomorphological diagnosis (January2017 to June 2018)

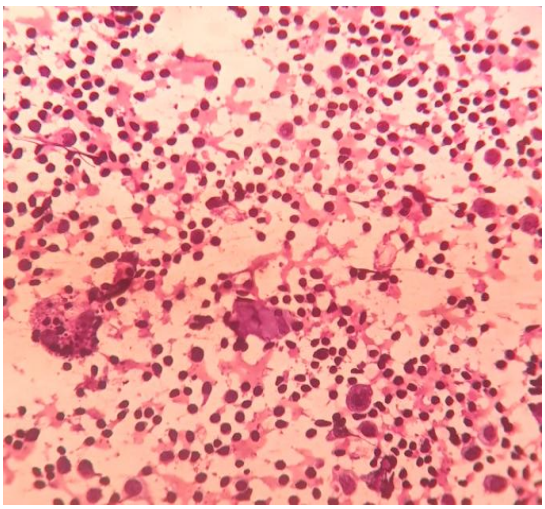

Figure: 3 FNAC: Reactive hyperplasia-cellular smear with polymorphous population of lymphoid cells and tingible body macrophage. H&E stain (10X)

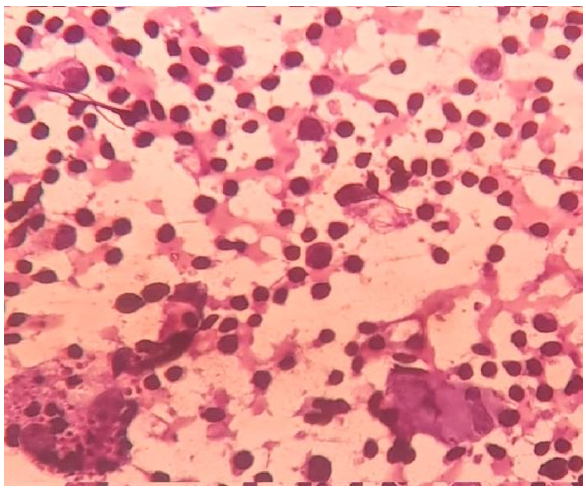

Figure: 4 FNAC: Reactive hyperplasia-cellular smear with polymorphous population of lymphoid cells and tingible body macrophages. H&E stain 40X

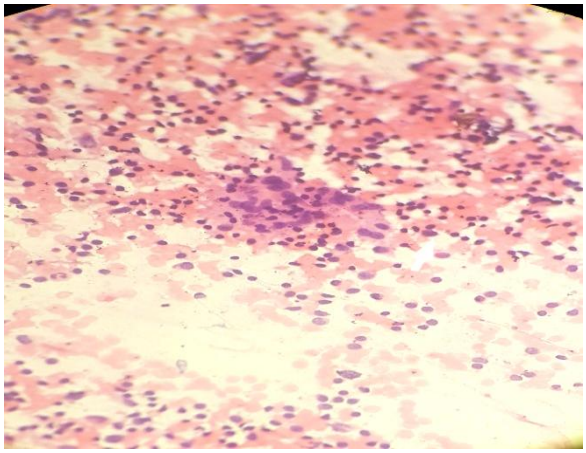

Figure: 5 FNAC: Granulomatous lymphadenitis- Smear shows epithelioid granuloma in a background of haemorrhage and lymphocytes. H&E stain (10x)

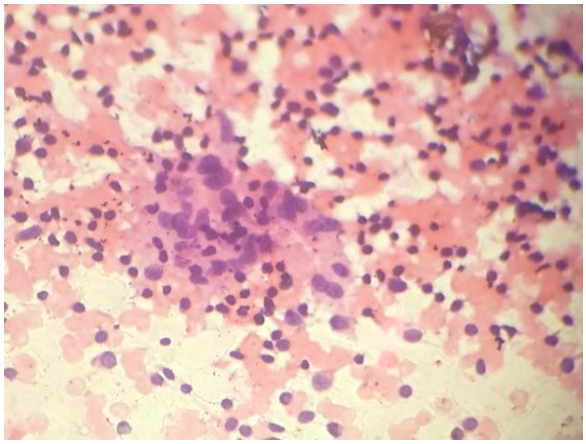

Figure: 6 FNAC: Granulomatous lymphadenitis- Smear shows epithelioid granuloma in a background of haemorrhage and lymphocytes. H&E stain (40x)

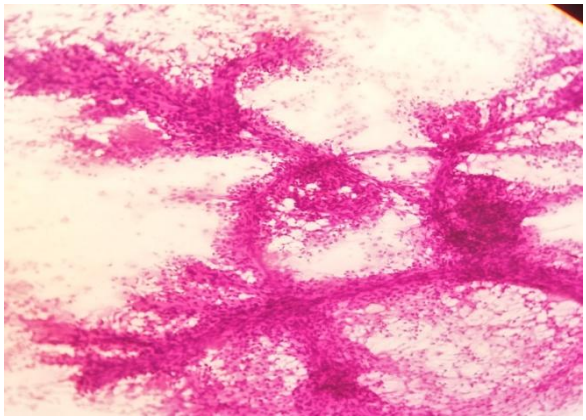

Figure: 7 Metastatic deposit in lymphnode Papillary carcinoma. Smear shows malignant cell cluster in papillary pattern with fibrovascular core. H&E stain (10x)

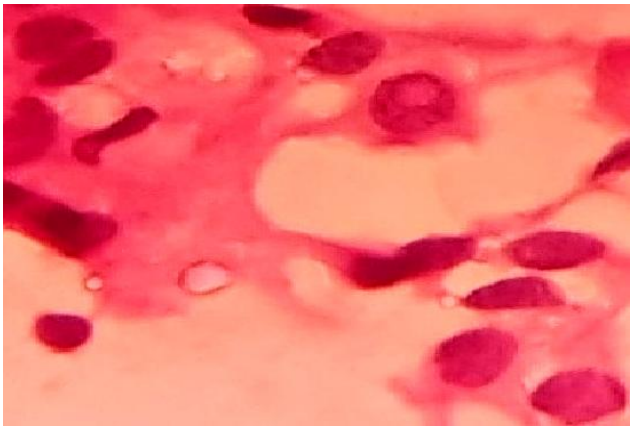

Figure: 8 Metastatic deposit in lymphnode Papillary carcinoma. Smear shows malignant cell cluster and intranuclear cytoplasmic inclusion . H&E stain (40x)

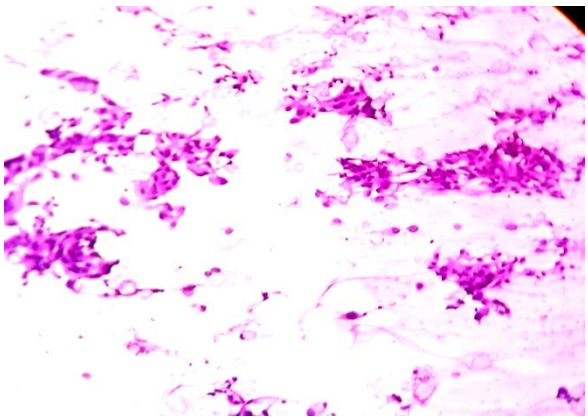

Figure: 9 Metastatic deposit lymphnode Squamous cell carcinoma.smear showing sheets of squamous cell with eosinophilic cytoplasm and hyperchromatic pleomorphic nuclei. H&E stain (10x)

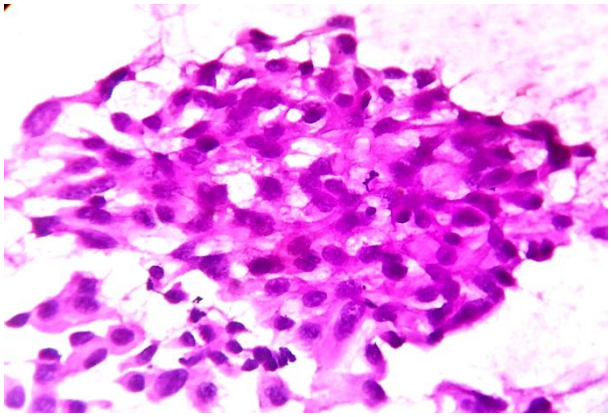

Figure: 10 Metastatic deposit lymphnode Squamous cell carcinoma.smear showing sheets of squamous cell with eosinophilic cytoplasm and hyperchromatic pleomorphic nuclei. H&E stain(40x)

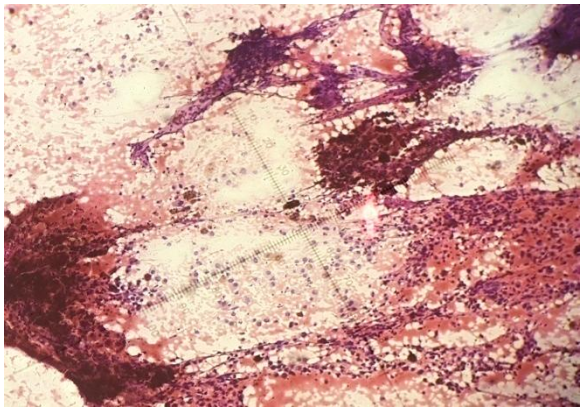

Figure: 11 Metastatic deposit lymphnode Malignant melanoma.Smear show malignant cells in cluster and in singles intracellular and extracellular melanin pigments seen. H&E stain(10x)

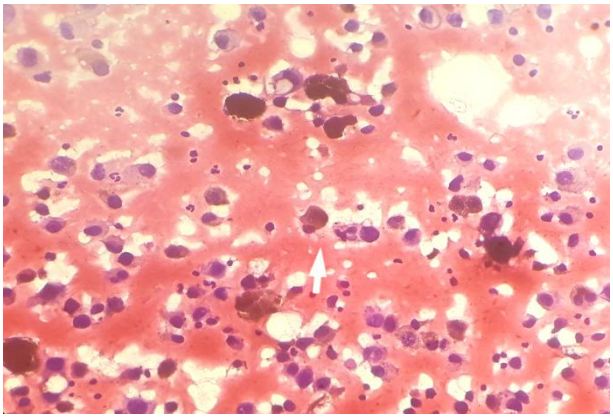

Figure: 12 Metastatic deposit lymphnode: Malignant melanoma.Smear show malignant cells in cluster and in singles intracellular and extracellular melanin pigments seen. H&E stain (40x)

Correlation of age group and gender with cytodiagnosis

Cytomorphologic patterns according to age and sex during the period of January 2017 to June 2018 showed that reactive hyperplasia was more common in age group of 21-30 years (21/76) cases and more common in male patients, Granulomatous lymphadenitis were more common in 21-30 years age group (12/56 cases)and more common in female patients. Acute suppurative lymphadenitis was more common in 31-40 years of age group(4/7cases) and equally distributed in both sexes. Among the neoplastic cases, Lymphoproliferative disorder was more common in 41-60 years of age group(2/3cases) and commonly seen in male patients .Metastatic deposit was more common in >60 years age –group(6/7cases) and in male patients. (Table:4) Female cases were more common in this study (82,54.7%) than male (68/150, 45.3%), Reactive lympadenitis was more frequent in male and granulomatous lymphadenitis in female patient. Metastatic deposit was more common among male (>60 years).

Correlation between age group, gender and cytomorphological pattern of metastatic deposit

Out of (7/150) cases of metastatic deposit of lymph nodes, (5/7) cases of cervical lymphadenopathy, 3cases were diagnosed as squamous cell carcinoma and 2 cases were diagnosed as papillary carcinoma ,most of the patients were in age group of (>60 years) except 1case of papillary carcinoma between (50-60) years of age group. 1 out of 7 cases of supraclavicular lymphadenopathy was diagnosed as adenocarcinoma at age group of (>60 years) .1 out of 7 cases of inguinal lymphadenopathy was diagnosed as malignant melanoma at age group of (>60 years). All patients diagnosed as metastatic deposit of lymphnode were male. (Table: 5)

Discussion

FNAC is a valuable diagnostic tool for establishing a diagnosis in cases of superficial lymphadenopathy[4]. It offers immediate preliminary diagnosis in the investigation of lymphadenopathy with minimal trauma to the patient at a considerable lower cost than surgical biopsy[5],[6]. However grey areas still exist in the establishment of an exact diagnosis especially in the case of primary lymphoproliferative disorders, where distinguishing low grade non- Hodgkin's lymphoma from a reactive hyperplasia may pose a diagnostic conundrum even in experienced hands[7],[8]. In the present study done over a period of 18 months which includes 150 patients who presented with peripheral lymphadenopathy were diagnosed by fine needle aspiration cytology. Out of 150 cases cervical lymphnodes (100/150, 66.6%)were most commonly involved, followed by supraclavicular (10.6%), axillary (9.3%), submandibular (6%), inguinal (4.6%) and post auricular (2.6%). Similar finding was noted by Sheela KM et al[9]

Table: 4 Distribution of Cytomorphological pattern according to age and sex

	lymphadenitis		lymphadenitis		lymphadenitis		lymphadenitis		disorder		deposit	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
<10	4	0	11	2	1	0	0	0	1	0	0	0
10—20	2	5	2	4	1	1	0	0	0	0	0	0
21-30	4	8	14	7	0	0	0	1	0	0	0	0
31-40	5	2	10	3	1	3	0	0	0	0	0	0
41-50	2	7	1	9	0	0	0	0	1	0	0	0
51-60	3	5	4	7	0	0	0	0	1	0	1	0
>60	6	3	1	1	0	0	0	0	0	0	6	0
Total	26	30	43	33	3	4	0	1	3	0	7	0

Table: 5 Cytomorphological pattern of metastatic deposit, age sex and site

Squamous cell carcinoma		3	Male	Cervical	3
Papillary carcinoma	1	1	Male	`Cervical	2
Adenocarcinoma		1	Male	Supraclavicular	1
Malignant melanoma		1	Male	Inguinal	1

Out of 150 cases reactive hyperplasia was the most common cytomorphological pattern76/150(50.66%) similar finding was noted in Shrivastav A et al, Mohanty R et al and Pandey P et al, Duraiswami et al [7],[8],[10][15], followed by granulomatous lymphadenitis (56/150,37.3%) as second most common diagnosis, similar finding noted in Kumar H et al and Shilpa G et al[11],[12] , Majority of the cases were clinically proved as tuberculosis.

Acute suppurative lymphadenitis was seen in7/150 cases (4.66%).

Lymphoproliferative disorder was seen in (3/150,2%) we could not get the histopathological correlation for these three cases as the patients were lost on follow up.

Metastatic deposit was seen in 7 cases which includes three cases of squamous cell carcinoma , one was an esophageal growth and the other two growth in the buccal cavity. Two cases of papillary carcinoma was reported both were histologically proved to be a metastatic deposit from thyroid, One case of adenocarcinoma was reported, endoscopically growth was found in the stomach, Malignant melanoma was reported in one case in which the patient clinically presented as pigmented lesion in the leg. The findings were comparable with studies done by Mohan et al.[16].

Necrotic lymphadenitis was reported in one out of 150 cases and it was the least reported among other pattern.

The relative frequency of pathologies varies with the type of hospital and the demographics of the dependent population.[13],[14].

Female cases were more common in this study (82,54.7%) than male (68/150,45.3%) comparable finding was noted in Duraiswami et al [15],Reactive lympadenitis was noted more frequent among males and granulomatous lymphadenitis in females. Metastatic deposit was more common among males (>60 years).

Conclusion

FNAC is simple, minimally invasive ,inexpensive and rapid diagnostic tool in the diagnosis of lymphadenopathy. In this study it was found that the majority of patients had reactive lymph node hyperplasia followed by granulomatous lymphadenitis as the second most common pathology, metastatic deposit was diagnosed in 7 cases (4.66%). FNAC plays an important role in places where histopathological facilities are not available, in early diagnosis of benign and malignant lesions and also helps in planning early management of lymphadenopathies.

Funding: Nil

Conflict of interest: None declared

Ethical approval: Not required

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