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Original Research Article

Cytological spectrum of disease in Lymph node swellings among patients attending a tertiary care teaching hospital with special emphasis on tuberculous lymphadenitis

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Abstract: Lymph node swellings are a common clinical presentation in the hospital outpatient departments. Such swellings may be easily investigated by Fine needle aspiration cytology (FNAC) which is safe and yields a rapid diagnosis. Moreover, in developing countries like India where Tuberculosis (TB) is a continual problem, patients frequently present with manifestation of extra pulmonary TB, in which Lymph nodes (LNTB) are predominantly involved. This study was undertaken to assess the cytological spectrum of lymph node pathologies in relation to age, sex and site, with special emphasis on tuberculous lymphadenitis. The study was conducted in a tertiary care teaching hospital for a period of one year. All patients presenting with superficial lymph node swellings were subjected to Fine Needle Aspiration Cytology (FNAC) and categorized according to the diagnosis, age and sex of patient. The data was entered in SPSS V.21 and analyzed. Of the 420 patients presenting with lymphadenopathy, 34.04% were LNTB (Granulomatous Lymphadenopathy) and rest were non LNTB. Among the LNTB 13.99% were children and 86.01 % were adults. Neck nodes (51.05%) were the predominant involvement of LNTB both among children and adults. The peak age group presenting with lymphadenopathies was 40-49.

Keywords: FNAC, Lymphadenitis, Tuberculosis, Extra pulmonary TB, Lymph node TB, Granulomatous.

INTRODUCTION

Lymph node swelling is a common clinical presentation in the medical, surgical and ENT outpatient departments (OPD). Asymptomatic lymphadenopathies are picked up by physician during routine physical examinations. Such superficial and some deep seated swellings may be initially investigated by fine needle aspiration cytology (FNAC). This technique has proved to be a reliable, rapid and non-invasive procedure in the diagnosis of lymph node pathologies. The spectrum of disease in the lymph nodes can vary from a large number of benign conditions to primary lymphomas [1]. In developing countries like India, where tuberculosis (TB) remains a persistent problem; the prevalence being 230 rate per 1,00,000 populations, tuberculous lymphadenitis / Lymph node TB [LNTB] constitutes 35% of the Extra Pulmonary Tuberculosis [EPTB] cases both in HIV positive as well as negative cases [2-5].

This study was undertaken to identify the cytological pattern of disease among patients presenting with or incidentally found to have lymph node swellings and to estimate the prevalence of LNTB among patients with lymphadenopathies.

MATERIAL AND METHODS

Study Site

The study was conducted among the patients attending the Chennai Medical College Hospital and Research Centre, a tertiary teaching hospital situated in the rural outskirts of Trichy district of Tamil Nadu state.

Duration of the study

The study was conducted over a period of one year from June 2013 to May 2014

Type of study

Prospective Cross Sectional Observational study.

Sample collection

The subjects included in this study were patients presenting at Medicine/surgical and ENT OPDs with symptomatic or incidentally found to have asymptomatic lymph node swellings. Fine Needle Aspiration [FNA] was done in the department of Pathology on the largest palpable lymph node swelling, after getting informed consent from the patients.

Sample size

The test was conducted on a total number of 420 patients.

Inclusion criteria

All age groups of both sexes with lymph node enlargement were included in the study.

Exclusion criteria

Patients who already had a histopathological diagnosis of the swellings were excluded from the study.

Institutional Ethics Committee clearance

The study was presented before the Institutional Ethics Committee and IEC clearance was obtained to conduct the study in accordance with the ethical standards of the committee on human experimentation.

METHODOLOGY

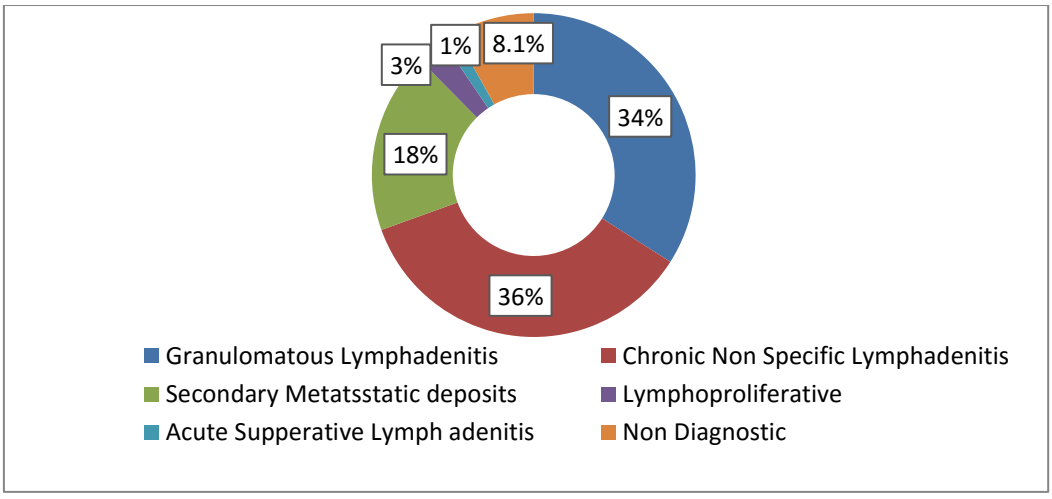
FNAC of palpable lymph nodes, to obtain adequate samples, were done by standard techniques that included target palpation, immobilization, proper needle tip placement and aspiration by movement of the needle (24G). The aspirate was smeared on 3 to 4 slides. The slides were then fixed in alcohol or air dried for staining by Papanicolaou/ Hematoxylin- eosin and May-Grenwald-Giemsa methods respectively using standard protocol [6,7].

Statistical Analysis

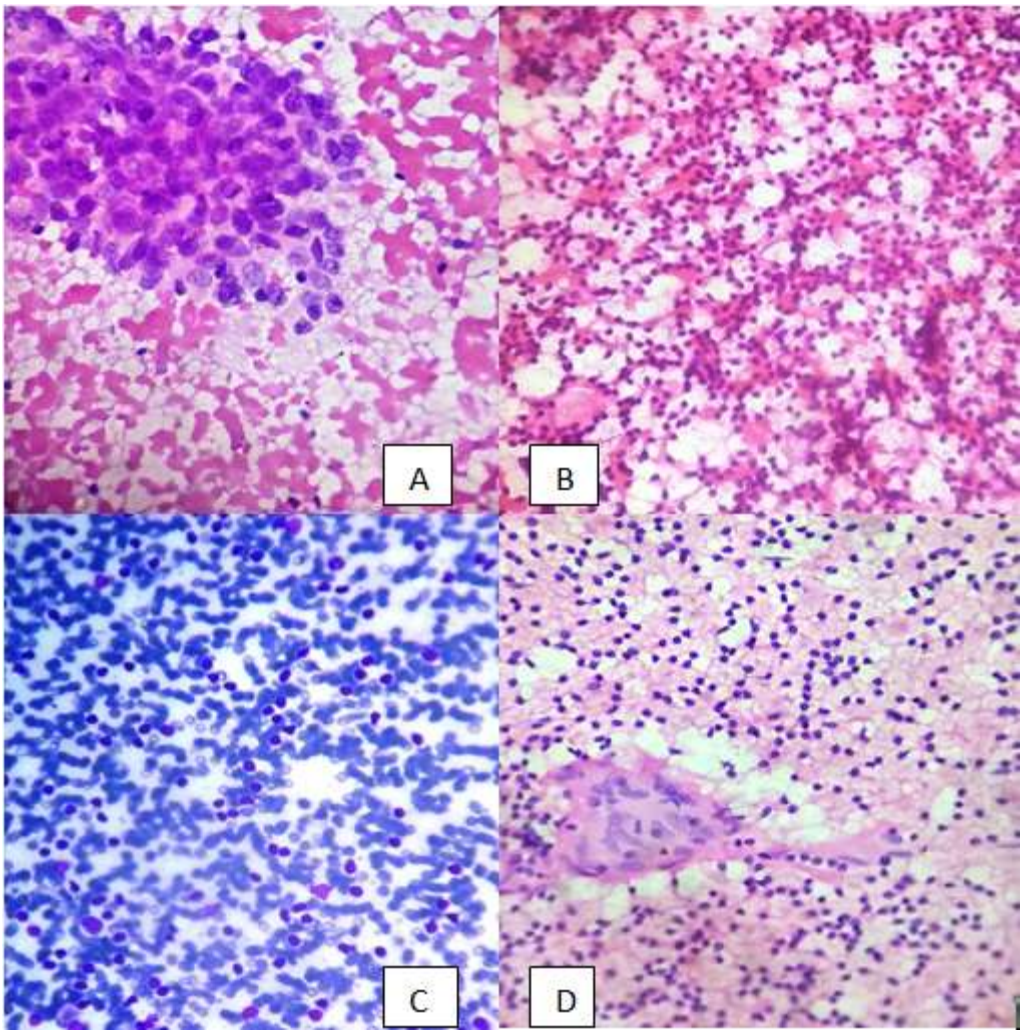
The data was entered in SPSS V.21 and analyzed.

RESULTS

Among the 420 patients examined, 264 were males and 156 were females. The majority of cases were either found to have chronic granulomatous lymphadenitis or chronic reactive lymphadenitis. Others showed secondary metastatic deposits, few showed acute suppurative lymphadenitis while a significant number of cases were found to be non-diagnostic.



Fig/Table-1: Frequency of different causes of lymphadenitis on FNA



Fig/Table-2: Microscopic images of lymph node aspirates

High power field (x40)**:** A-Metastatic squamous cell carcinoma in a lymph node aspirate (H&E stain**)** B- Chronic reactive lymphadenitis (H&E) C- Chronic lymphatic leukemia; lymph node (MGG stain), D- Granulomatous lymphadenitis.

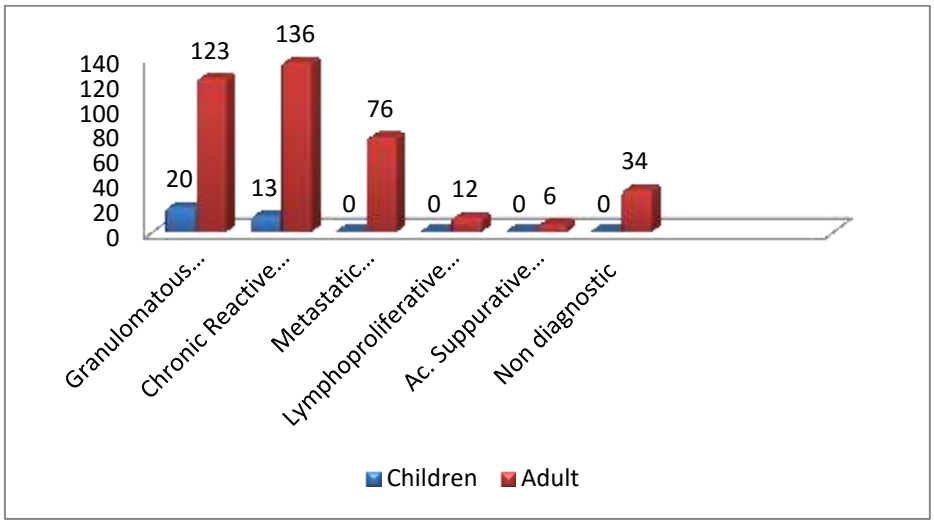
Sex wise analysis of the data showed higher prevalence of Lympho-proliferative lesions among males, which was found to be statistically significant ($p<0.05$). But the difference found among sexes having tuberculous lymphadenitis, chronic reactive lymphadenitis, secondary metastatic deposits and acute suppurative lymphadenitis were not significant ($p> 0.05$) by Fisher's exact test (Table 3).

Fig/Table-3: Sex wise frequency of different causes of lymphadenitis

S.No.	Types of Lymphadenitis	Frequency		
		Female	Male	Total
1	Granulomatous Lymphadenitis/LNTB	55 (13.10)	88 (20.96)	143 (34.04)
2	Chronic reactive Lymphadenitis	62 (14.77)	87 (20.71)	149 (35.47)
3	Secondary metastatic deposits	21 (5)	55 (13.10)	76 (18.10)
4	Lymphoproliferative neoplasms	1 (0.23)	11 (2.62)	12 (2.86)
5	Acute suppurative Lymphadenitis	2 (0.47)	4 (0.95)	6 (1.43)
6	Non Diagnostic	15 (3.57)	19 (4.52)	34 (8.10)
Total		156 (37.14)	264 (62.86)	420 (100)

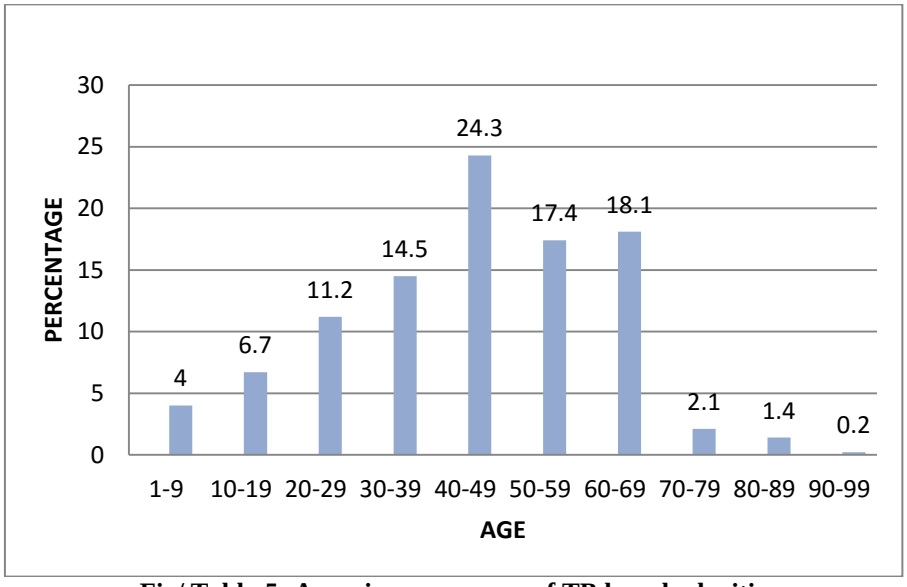
Children were found to be exclusively affected with TB Lymphadenitis (4.76%) and Chronic Reactive Lymphadenitis (3.09%) while other types of lymphadenitis were not recorded among them. However

the adult population showed all the forms of Lymphadenitis (Fig 2).The prevalence of Granulomatous Lymphadenitis was 29.28% and Chronic reactive lymphadenitis was 32.38% which were higher among adults and statistically significant ($p<0.05$) (Fig 4).



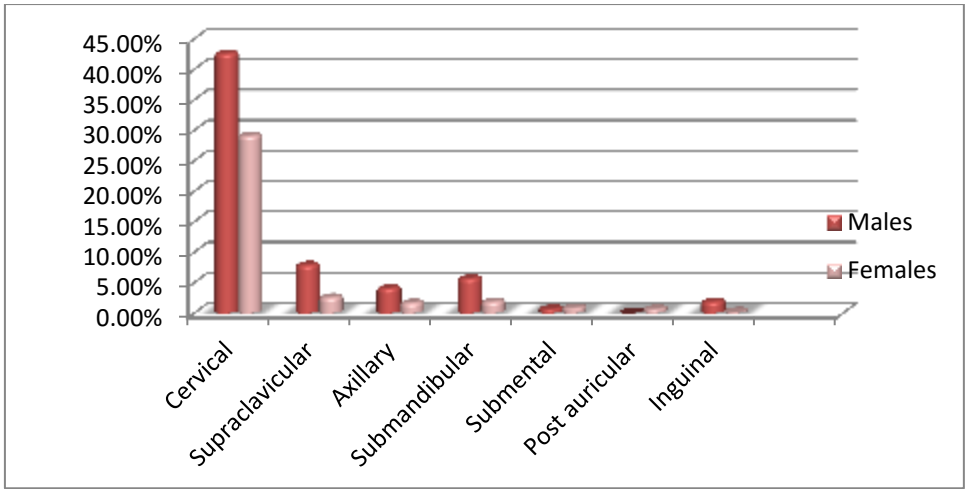
Fig/Table-4: Lymphadenitis among children and adults

Lymphadenitis was more prevalent among the age group between 30 to 69yrs which constitutes about 74.5% with a peak being found in the 40-49 age group (24.3%) as depicted in Fig 5.



Fig/ Table-5: Age wise occurrence of TB lymphadenitis

Manifestation of lymphadenopathies was higher in the cervical nodes in both sexes, with a significant cervical node involvement in males compared to the females. The only lymph node regions which showed mild predominance in females was submental and post auricular regions. The supraclavicular, axillary, submandibular and inguinal nodes lymphadenopathies was profoundly higher among the males (Fig 6).



Fig/ Table-6: Sex wise presentation of Lymphadenitis in different regional lymph nodes

Fig/Table-7: Region wise manifestation of lymphadenopathy in children and adults.

Age/Nodes	Cervical	Supraclavicular	Axillary	Submandibular	Inguinal	Submental	Auricular	Total
0-14	31(7.37)	1 (0.23)	0	0	0	1 (0.23)	0	33 (7.86)
>15	270(64.28)	43 (10.23)	24(5.71)	32 (7.61)	9 (2.14)	6 (1.42)	3 (0.71)	387(92.14)
Total	301(71.65)	44 (10.47)	24(5.71)	32 (7.61)	9 (2.14)	7 (1.66)	3 (0.71)	420 (100)

(Figures in the Parenthesis denotes percentage)

In children, the cervical, supraclavicular and submental nodes were involved whereas in the adults (15 and above) the axillary, submandibular, inguinal and auricular nodes were also involved along with other nodes (Table 7).

Fig/Table-8: Granulomatous Lymphadenitis /LNTB

Age/Nodes	Cervical	Supraclavicular	Axillary	Submandibular	Inguinal	Submental	Auricular
Children	19 (13.29)	1 (0.70)	0	0	0	0	20 (13.9)
Adults	105(73.43)	3 (2.09)	6 (4.19)	5 (3.50)	3 (2.10)	1 (0.70)	123(86)
Total	124 (86.72)	4 (2.79)	6 (4.19)	5 (3.50)	3 (2.10)	1 (0.70)	143 (100)

(Figures in the Parenthesis denotes percentage)

The manifestation of Granulomatous lymphadenitis in the cervical nodes was found to be higher both in children and adults. However, nodes in other regions like axillary, submandibular, inguinal and auricular were not involved in children (Table 3). Granulomatous lymphadenitis/ LNTB accounted for 34.04%, of all lymph node pathologies, of which children alone constituted 4.76% and adults 29.28% (Fig 4 & Table 8).

Fig/Table-9: Sex wise & Age wise occurrence of Granulomatous Lymphadenitis /LNTB

Sex/Age	1-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	Total
Female	5 (3.49)	5 (3.49)	12 (8.39)	10 (6.99)	12 (8.39)	4 (2.80)	5 (3.49)	0	2 (1.4)	55
Male	4 (2.80)	14 (9.79)	15 (10.49)	12 (8.39)	15 (10.49)	10 (6.99)	18 (12.59)	0	0	88
Total	9 (6.29)	19 (13.28)	27 (18.88)	22 (15.38)	27 (18.88)	14 (9.79)	23 (16.08)	0	2 (1.4)	143

(Figures in the Parenthesis denotes percentage)

Granulomatous lymphadenitis was higher among the age groups of 20-29, 30-39, 40-49 and 60-69. Sex wise analysis of the same showed that the difference existing among the sexes was not statistically significant (P>0.05) (Table 9).

DISCUSSION

Evaluation of lymph node swellings by FNAC is a quick, reliable and cost effective method of diagnosis all over the world. In India, where the burden of TB is high; annually, the new cases of tuberculosis is estimated to be 2.2 million of the 8.6 million globally reported cases [8]. The WHO Global TB report shows that in India, 2,26,557 new extra pulmonary TB being notified in 2014.[9] Common sites of manifestation of extra pulmonary tuberculosis are the lymph nodes, genitourinary, bone, central nervous system, peritoneum and other abdominal organs [10]. A study conducted by Prasad et al on 2216 patients showed similar findings as ours with reactive lymphadenitis being the commonest followed by LNTB[11]. Another study conducted in Wardha District, Maharashtra showed that the affected children were 32.9% [12]. The most affected age group in our study was 40-49 yrs.

A similar study conducted at New Delhi, showed higher incidence in the age group of 21-30 and in both the studies adult population were more affected than children [13]. In a study conducted at Chandigarh the commonest age group affected was 11-20 age group [14]. The present study concurs with the above two studies the most affected age group being 20-49 yrs (52.5%). Interestingly in this study 60-69 age group were also considerably affected (16.09%). In a study conducted by Dandapet *et al*., 70% of cervical node, 8.75% of inguinal node and 6.25% of axillary nodes were involved in by TB lymphadenitis [15].

A similar study conducted among 377 patients in Pakistan involving neck nodes alone. The study showed LNTB as the commonest cause followed by reactive lymphadenitis, metastatic carcinoma, Lymphoproliferative disorders, Acute and chronic lymphadenitis and Non diagnostic (12%) which is more or less similar to the present study except for the slightly higher prevalence of reactive lymphadenitis in our study [16]. The differences may be due to our study including all lymph nodes in contrast to that study which involved only the neck nodes. In a study conducted at Peshawar, females were more affected with LNTB than males (29% male and 71% of female). In our study, males were more affected (62.9%) than females (37.1). The regional difference may be attributed to the socioeconomic, unhygienic working conditions, smoking habits, alcohol intake and prevalence of HIV. In the same study 20% of children were reported to have LNTB, whereas in our study only 13.99% of children were affected [17].

A study conducted at Germany showed that 63.3% of cervical lymph node, 26.7% of mediastinal lymph node and 8.3% of axillary lymph nodes presented were involved by TB [16]. In the present study cervical node involvement constituted 86.72 %, while mediastinal nodes were not assessed and other nodes showed only 13.28 % involvement [18]. Of the 420 cases, 270 were correlated histologically. FNA on subsequent biopsy of 81 lymph nodes with benign hyperplasia were studied and showed that aspiration did not interfere with subsequent histologic assessment.

Thus FNAC is a simple procedure, and should be assorted to, whenever the swelling is accessible or superficial thereby helping in establishing an early and reliable diagnosis.

CONCLUSION

FNAC of lymph node swellings is a reliable and safe technique in arriving at the diagnosis. Due to the heavy burden of TB in India, TB lymphadenitis has possibly appeared to be one of the commonest causes of lymphadenopathy, only second to reactive lymphadenitis. Males showed higher prevalence of lymphoproliferative lesions involving lymph nodes whereas other lesions were not statistically significant. FNAC from lymph nodes in children were exclusively found to have LNTB or reactive lymphadenitis, whereas other lesions were not recorded in them. The study throws light on the magnitude of the burden of LNTB in the region as well as the prevalence of disease among children and adults.

LIMITATIONS

This is a single centered study and HIV and Non HIV patients were not differentiated. All granulomatous lymphadenitis cases were correlated with Mantoux positivity and high ESR readings with or without evening rise of fever and concluded as tuberculous lymphadenitis (LNTB). However not all of them were histologically or microbiologically tested for acid fast bacilli (AFB) positivity. Moreover the significant number of non- diagnostic cases in our study could be partly due to scant / inadequate cellularity or technical errors.

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