

Original Research Article**Utility of Fine Needle Aspiration Cytology in Nonneoplastic Lesions of Lymphnodes****Parvathi Jigalur^a, Rajesh H. Chandan^b, Arathi S.^c, Sujata S.G.^d**^aAssistant professor ^bAssociate Professor ^cAssistant Professor ^dProfessor & HOD, Dept. of Pathology, Karnataka Institute of Medical Sciences, Hubballi, Karnataka 580022, India.**Abstract**

Introduction: The goal of fine needle aspiration cytology of lymph node is essentially to distinguish benign from malignant lesions. Nonneoplastic disorders that can manifest in lymph nodes include those with specific diagnosis and nonspecific causes, reactive hyperplasia being the most common diagnosis. The role of fine needle aspiration cytology (FNAC) is of paramount importance in determining the etiology of lymphadenopathy, so that appropriate management can be instituted.

Aims and Objectives: To identify, to categorise and to study incidence of various nonneoplastic lesion of lymphnodes.

Materials and Methods: FNAC'S were done using a 22 guage needle with ten cc syringe for superficial lesions and lumbar puncture needle for deep seated lesions under ultrasound guidance. In this study patients were divided into three groups based on age i.e group 1 (0-20 years), group 2 (21-50 years) and group 3 (>50 years).

Observation and Results: Out of 6411 FNAC cases during one and half years study, 1117 cases were enlarged lymphnodes. A major proportion of lymphadenopathies in this study were due to benign conditions 809 cases (72.42%). Malignant cases accounted for 308 cases (27.57%). Among 1117 cases, maximum number of cases were recorded in age group 2:480 cases. (42.97%), group 1: had 334 cases (29.90%) followed by group 3:303 cases (27.12%). Out of 809 nonneoplastic cases the most common cause of lymphadenopathy was found to be reactive lymphadenitis with 517 cases (63.91%), followed by tuberculosis with 241 cases (29.78%), also seen were BCG lymphadenitis in 4 cases (00.49%).

Conclusion: In our study we concluded that different etiological factors play a role in causation of lymphadenopathy. So FNAC provides a reliable, safe, rapid and economical method of screening these patients.

Keywords: Fine Needle Aspiration Cytology; Reactive Lymphadenitis; Nonneoplastic Lymphadenopathy.

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Introduction

FNAC is a commonly used diagnostic approach in the investigation of enlarged lymphnodes. It is an OPD

procedure with little trauma to patient at a lower cost compared to biopsy. Lymphadenopathy is manifested clinically by the enlargement of lymphnodes. The vast majority of enlarged lymphnodes are nonneoplastic.

Therefore their recognition and differential diagnosis are of great importance to rule out the neoplastic diseases.

Needle aspiration of lymphnodes is one of the oldest applications of the technique in the diagnosis of human disease. In 1904, two British military surgeons, Greig and Gray, working in Uganda, published a paper describing the diagnosis of sleeping sickness by recognizing mobile trypanosomes in lymph node aspirates. In 1921, Guthrie of Johns Hopkins described the application of needle aspiration to the diagnosis of tumors. In 1930, Martin and Ellis of Memorial Hospital for Cancer (now the Memorial Sloan-Kettering Cancer Centre) included tumors that had metastasized to the lymph nodes among the targets of aspiration biopsy [1].

As a result of the pioneering work of Franzén et al (1960) and the widespread current acceptance of the technique, aspiration of lymph nodes has become a standard laboratory procedure [1].

The spectrum of applications of fine needle aspiration (FNA) biopsy in diagnosing disease has become ever wider. The technique has been found most useful for the selection of a representative node for biopsy, for the diagnosis of recurrent lymphoma, for staging the extent of the disease, and for monitoring treatment [2].

Hence in order to make the most rational use of fine needle aspiration cytology (FNAC), clinicians and pathologists alike must understand and accept that the aims and purpose of fine needle biopsy (FNB) of peripheral lymph nodes at the 'primary' or 'community' level are different from those at the 'secondary' or 'specialist' level.

At the primary level, FNAC is used as a triage to distinguish between cases of lymphadenopathy with a high or a low level of suspicion of significant disease by the simplest, least invasive and least costly method. This preliminary assessment is based on routine cytologic smears only. Depending at the specialist/secondary level, the role of FNB is to provide material for further cytomorphologic analysis and for ancillary studies [3]. Here we studied the spectrum of nonneoplastic lesions of lymph node based on routine cytologic smears.

Aims and Objectives

1. To identify the cause of enlarged lymphnode and to rule out neoplasia.
2. To categorise various nonneoplastic lesions of lymphnodes.
3. To study the incidence of various nonneoplastic lesions.
4. To study site wise distribution of nonneoplastic lymphadenopathy.

Materials and Methods

This is a combined prospective and retrospective study of all lymphnodes FNAC'S reported over a period of 18 months from January 2016 to June 2017. This study was carried out in the department of Pathology. In this study patients were divided into three groups based on age i.e group 1 (0-20 years), group 2 (21-50 years) and group 3 (>50 years). All FNAC'S were performed using a 22 gauge needle for conventional, superficial lesions. For deep seated lesions lumbar puncture needle was used with ultrasound guidance. The smears were routinely stained after air drying with Geimsa, alcohol fixed smears were stained with PAP, H & E and observations made. Ziehl-Neelsen stain was done in suspected tubercular lesion.

Results

The total number of cases studied was 1117. The age of the patients ranged from one month to 93 years. Among these lesions 809 (72.42%) cases were nonneoplastic. Neoplastic lesions constituted 308 cases (27.57%).

Maximum number of cases were recorded in group 2: 480 cases (42.97%). The age of the patient is a key factor in diagnosis. In younger patients enlarged lymphnodes are mostly due to nonneoplastic conditions.

Out of 809 cases, cervical group of lymphnodes were the most aspirated 654 cases (80.84%). Followed by axillary lymphnodes in 65 cases (8.03%). Supraclavicular in 36 cases (4.45%), inguinal in 34 cases (4.20%), abdominal in 2 cases (0.25%), occipital in 10 cases (1.24%), left arm in 2 cases (0.25%), and generalized lymphadenopathy in 4 cases (0.49%). We also had one case (0.12%) of enlarged parotid lymphnode.

Among the diagnosis of aspirated nonneoplastic lymphnode lesions, the most common cause of lymphadenopathy was found to be reactive lymphadenitis in 517 cases (63.91%) out of 809 (72.42%). Among the infectious cause of lymphadenopathy, tuberculous lymphadenitis was the most common accounting to 241 cases (29.78%).

Followed by granulomatous lymphadenopathy in 26 cases (3.22%), and suppurative pathology in 20 cases (2.47%). We had four (0.49%) cases of BCG lymphadenitis. One case (0.13%) of calcification was noted. This study revealed higher incidence of reactive lymphoid hyperplasia in group 2 (21-50 years).

It was observed that the cases of granulomatous and suppurative lesion was highest in group 2. Whereas BCG lymphadenitis and calcification was seen in only group 1(0-20) patients. Comparison of distribution of nonneoplastic lymphnode diagnosis of present study with different studies showed similar results.

Table 1: Age wise distribution of lymphadenopathy patients (n=1117)

Groups	Age Group (years)	No of cases	Percentage
Group1	0-20	334	29.90%
Group2	21-50	480	42.97%
Group3	>50	303	27.12%
Total		1117	100 %

Table 2: Result of FNAC showing frequency distribution of various nonneoplastic conditions in each group. n =809

Diagnosis	Group 1		Group 2		Group 3	
	No. of % cases		No. of % cases		No. of % Cases	
Reactive	178	22.00%	216	26.70%	123	15.20%
Tuberculosis	65	08.03%	112	13.84%	64	7.91%
Granulomatous	05	0.61%	13	1.60%	08	0.99%
Suppurative	04	0.49%	09	1.11%	07	0.86%
BCG lymphadenitis	04	0.49%	–		–	
Calcification	01	0.13%	–		–	
Total	257		350		202	

Table 3: Distribution of sites of lymph node involvement(n=809)

Sites	No of Cases	%
Cervical	654	80.84%
Axillary	65	08.03%
Supraclavicular	36	04.45%
Inguinal	34	04.20%
Occipital	10	01.24%
Generalized lymphadenopathy	04	00.49%
Left arm	02	00.25%
Intraabdominal	02	00.25%
Parotid	01	00.12%
Retroperitoneal	01	00.12%
Total	809	100%

Table 4: Cytological diagnosis of Nonneoplastic lymph node aspirations(n=809)

Diagnosis	No. of Cases	Percentage
Reactive	517	63.91 %
Tuberculosis	241	29.79 %
Granulomatous	26	03.21 %
Suppurative	20	02.47 %
BCG lymphadenitis	04	00.49
Calcification	01	00.12 %
Total	809	100 %

Table 4: Comparison of Distribution of Nonneoplastic Lymphnode diagnosis with Other Studies

Diagnosis	Present Study	Biradar et al	Gayatri et al	Ripunjaya et al
Reactive	63.91 %	55.62 %	44.70 %	34.36 %
Tuberculosis	29.78 %	23.75 %	14.65 %	00.78 %
Granulomatous	03.22 %	00.37 %	14.65 %	20.28 %
Suppurative	02.47 %	00.37 %	03.94 %	11.26 %

Discussion

FNAC is a commonly used diagnostic approach in the investigation of lymphadenopathy. It is an OPD procedure with little trauma to a patient at a lower cost compared to biopsy. Lymphadenopathy can be due to nonneoplastic conditions or neoplastic lesions. The ratio of nonneoplastic

to neoplastic was 2.6:1 in our study. The ratio of nonneoplastic to neoplastic varies according to the kind of medical practice in which they present. In general practice malignancy represent 1.1% of lymphnode lesions, whereas at referral centres their frequency is 40-60% [4,5,6].

Lymphadenitis are acute and chronic inflammatory process of lymphnodes, that occur in response to a variety of pathogenic agents. Whereas lymphadenopathies are reactive process of lymph node in response to a variety of exogenous and endogenous stimulants. The etiology and pathogenesis of many lymphadenopathies are still unknown. Possible causes of lymphadenopathies include microorganisms not yet identified, autoimmune diseases, immune deficiency and dysregulation, foreign bodies, medical procedures, and tumours [7]. In cases of reactive lymphadenopathy, FNAC has made the diagnosis easier and the number of surgical biopsies has reduced. The causative organisms can be identified with FNAC in infectious cases.

The present study was done over a period of one and half year. One year retrospective and six months prospective study. The total number of FNAC during the period was 6411. Out of these 1117 cases presented with lymphadenopathy to department of pathology.

The anatomic location of localized adenopathy will sometimes be helpful in narrowing the differential diagnosis. For example cat scratch disease typically causes cervical or axillary adenopathy, infectious mononucleosis causes cervical adenopathy and a number of sexually transmitted diseases are associated with inguinal adenopathy. Parotid, submaxillary and epitrochlear lymphnodes are frequently encountered in HIV infections [8,9]. In our study the most common group of enlarged lymph nodes were cervical lymphnodes 654 cases (80.84%), followed by axillary in 65 cases (8.03%), supraclavicular in 36 cases (4.45%), inguinal in 34 cases (4.20%), abdominal in 2 cases (0.25%), occipital in 10 cases (1.24%), left arm in 2 cases (0.25%), and generalized lymphadenopathy in 4 cases (0.49%). Cervical lymphnodes were commonly involved in our study which was comparable with the findings of other workers [10,11,12,13]. We also had 1 case (0.12%) of parotid lymph node enlarged. The parotid gland is the only salivary gland to contain lymphoid tissues within its capsule. Because of their close association, pathologic changes within the two tissues are often combined thus raising questions about their pathogenesis and presenting problems of differential diagnosis [14].

Among the lesions, 809 (72.42%) cases were nonneoplastic and 308 (27.57%) cases were neoplastic which is similar to study done by Kim [15]. To recall the main etiologic categories, some authors suggest using acronyms like MIAMI (malignancies, infections, autoimmune, miscellaneous and iatrogenic) [4]. Nonneoplastic conditions had various lesions like reactive lymphadenopathy, tuberculosis, BCG lymphadenitis, granulomatous lymphadenopathy, acute suppurative lymphadenitis. Granulomatous lymphadenitis can be seen, not only in infectious process such as tuberculosis, atypical mycobacteriosis, brucellosis or infections caused by fungi,

but also in sarcoidosis, foreign body reactions, non – Hodgkin lymphoma, Hodgkin lymphoma. BCG lymphadenitis is a well known complication of BCG vaccination occurring in 0.013%-23% [16]. Our study showed four cases (0.35%) of BCG lymphadenitis. In other studies results are high [17]. We also had one case (0.08%) of lymphnode calcification. Nodal calcification suggest differential diagnosis, with prior granulomatous disease being the most common etiology. Benign causes of lymph node calcification are infectious etiologies such as tuberculosis [18], histoplasmosis, coccidiomycosis and aspergillosis, and non infectious causes such as silicosis [19]. It is also rarely reported in amyloidosis [20]. Radiologically malignant causes of calcified lymph nodes are lymphoma, metastatic thyroid carcinoma [18,21], mucinous adenocarcinoma and rarely squamous cell carcinoma [22], which can be confirmed by cytology. A calcified firm neck mass could suggest malignancy [23]. Our case of nodal calcification was due to tuberculosis.

In our study the most common cause of lymphadenopathy was reactive lymphadenopathy with 517/809 cases (63.91%). It was also the most frequent cause in other studies [12,24,25].

Conclusion

Lymphadenopathy is a commonly encountered condition in medical practice requiring prompt and accurate diagnosis so that a proper treatment protocol can be started. Lymphadenopathies are mostly nonneoplastic process, so their recognition and differential diagnosis are of great importance to rule out the neoplastic diseases. FNAC technique is useful for initial screening of lymphadenopathy at primary level or community level and further workup at specialist/secondary level for cytological morphologic analysis and ancillary studies.

In our study we concluded that different etiological factors play a role in causation of lymphadenopathy and that aspiration cytology provided a reliable, safe, rapid and economical method of screening the patients.

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