CYTOMORPHOLOGICAL PATTERN OF LYMPH NODE LESIONS- A FIVE YEAR STUDY IN REGIONAL INSTITUTE OF MEDICAL SCIENCES, IMPHAL

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ABSTRACT

BACKGROUND

Lymph nodes are an important part of immune system. Their enlargement is noted in a wide spectrum of diseases, including infections and malignancies, which are a common finding in clinical practice. Lymphadenopathy is common in all age groups and management of cases depends on the pathology, which can be studied by collecting material through fine-needle aspiration cytology.

MATERIALS AND METHODS

A prospective study of FNAC of 1000 cases of lymphadenopathy presenting to the Department of Pathology for 5 years.

RESULTS

Non-neoplastic lesions account for 72.3% with neoplastic lesions accounting 27.7%. Reactive hyperplasia was seen most often (40.3%) followed by Tubercular lymphadenitis (29.3%). Metastasis was seen in 26.4% where squamous cell deposits were commonest. Cervical lymph nodes were involved most often in all types of lymphadenopathy.

CONCLUSION

Reactive hyperplasia and tubercular lymphadenitis were the most common among patients presenting with lymph node swellings. FNAC is a simple, safe, reliable, and inexpensive method in early detection of lymph node lesions.

KEYWORDS

FNAC, Lymphadenopathy, Reactive Hyperplasia, Tubercular, Granulomatous, Metastatic.

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BACKGROUND

Fine needle aspiration cytology (FNAC) of superficial and deeply located lymph nodes are one of the more common samples encountered by cytopathologists. It is a simple, safe, reliable, rapid and inexpensive method of establishing the diagnosis of lesions and masses in various sites and organs.[1] Lymph node aspiration is of great value for the diagnosis of lymphadenitis, lymphomas and metastatic carcinoma. The value of FNAC, besides making a diagnosis, also lies in early direction of appropriate investigations. Aspirates from lymph nodes are usually very cellular and their interpretation varies from clear diagnosis to a firm request for histopathology. The knowledge of the pattern of lymphadenopathy in a given geographical region is essential for making a confident diagnosis or suspecting a disease.[2] we report here the cytomorphological pattern of 1000 cases of lymphadenopathies taken over a period of 5 years.

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Aim of the Study

To find out the pattern of diseases in lymph node by using FNAC in evaluation of cytomorphological features of various lymph node lesions.

MATERIALS AND METHODS

A prospective study of 1000 cases of lymphadenopathy presenting to the Department of Pathology for 5 years from January 2014 to December 2018 was taken up for our study. After obtaining informed consent from the patients, FNAC was performed using a 22–24-gauge needle and 20 ml syringe. The prepared smears were fixed in alcohol and stained with Giemsa stain. Ziehl–Neelsen (ZN) staining for AFB was done whenever a cytological diagnosis of granulomatous disease was made and also in cases with abundant necrosis and suppuration. Papanicolaou stain was done in metastatic lesions. PAS stain was done in any suspected cases of any fungal elements.

RESULTS

A total of 1000 aspirates were obtained with Male to Female ratio was 1:1.03. The age of the patients varied from 10 year to 82 years. The maximum incidences of cases were seen in the age range of 10-20 years as shown in (table 1).

The most common group of lymph nodes aspirated were in a decreasing order cervical, inguinal, supraclavicular submandibular, axillary, submental, postauricular and preauricular region as shown in (table 2).

Of the 1000 cases, 403 cases were diagnosed as reactive hyperplasia, followed by 293 cases of tubercular lymphadenitis 264 cases of metastatic malignancy 19 cases of acute suppurative lymphadenitis and total of 9 cases of Non -Hodgkin's lymphoma (NHL) and 4 case of Hodgkin's lymphomas. In 8 cases fungal bodies were detected (table 3).

A total of 293 cases of tuberculosis were recorded in the study showing granuloma with caseation necrosis in 131 cases which were positive for acid-fast bacilli (AFB).172 case showed granuloma only without caseation necrosis and AFB was not detected.

A total of 264 cases were diagnosed as metastatic deposits in the study. A slight male preponderance was noted with a maximum number of cases recorded in the cervical group of lymph nodes followed by supraclavicular. Maximum cases of metastatic deposits in the study were those of squamous cell carcinoma, followed by adenocarcinomas, anaplastic large cell carcinoma, small cell carcinoma of lungs, carcinoma deposits of breast, undifferentiated metastatic deposits and malignant melanoma.

Age in Years	Reactive Hyperplasia	TB	Metastasis	Total No. of Patients
10-20	165	40	0	205
21-30	120	71	6	197
31-40	99	52	21	172
41-50	78	46	28	152
51-60	48	14	50	112
61-70	47	11	59	117
71-80	24	6	38	68

Table 1. Age Wise Distribution

Site	Reactive Hyperplasia	TB	Fungal	Metastatic
Cervical	402	149	8	106
Inguinal	90	8	0	16
Supraclavicular	49	15	0	11
Axillary	43	21	0	13
Submandibular	43	15	0	11
Submental	24	2	0	4
Postauricular	24	2	0	4
Preauricular	5	0	0	0

Table 2. Site Wise Distribution of Lymph Node Lesions

Type of Lesions	No. of Patients	Percentages
Reactive Lymphadenitis	403	40.3
Tubercular Lymphadenitis	293	29.3
Metastases	264	26.4
Acute Supportive Lymphadenitis	19	1.9
Non-Hodgkin's Lymphoma	9	0.9
Fungal Lymphadenitis	8	0.8
Hodgkin's Lymphoma	4	0.4

Table 3. Distribution of Lesions

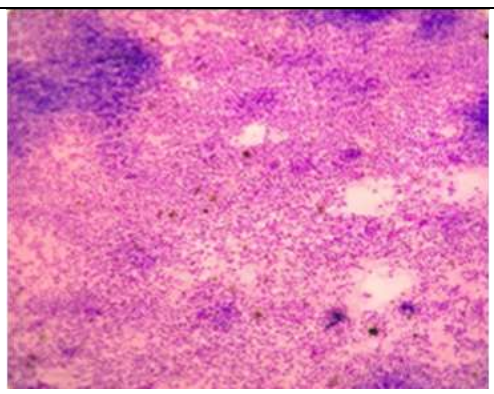

Figure 1. Microphotograph showing Polymorphous Population of Lymphocytes in Reactive Hyperplasia. (100x). Giemsa Stain

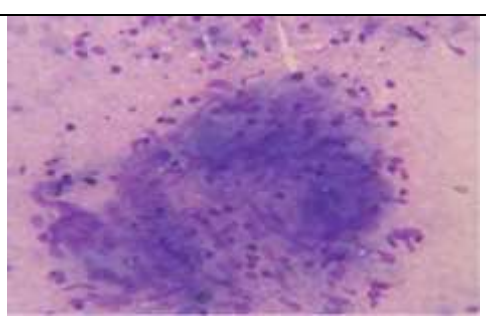

Figure 2. Microphotograph of Granulomatous Lymphadenitis showing Collection of Epithelioid Cells (400x). Giemsa Stain

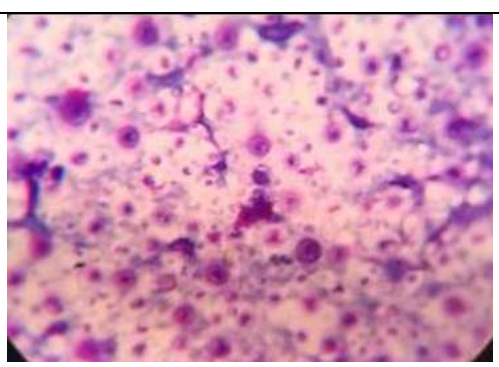

Figure 3. Microphotograph of Cryptococcus showing Scattered Yeast Like Organism Surrounded by Optically Clear Halo (400x). Giemsa Stain

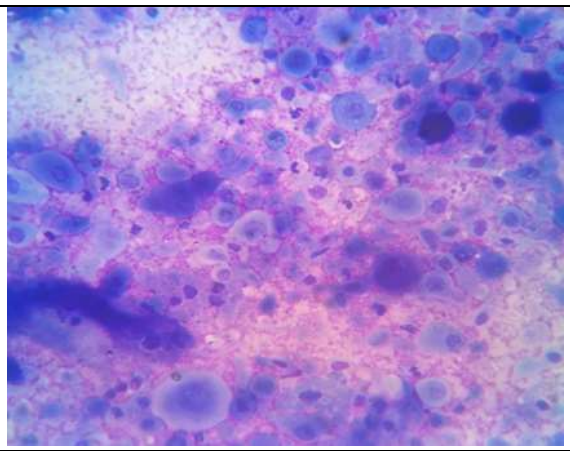

Figure 4. Microphotograph of Metastatic Deposits of Squamous Cell Carcinoma showing Characteristic blue Cytoplasmic Staining indicating Squamous Differentiation. (400x) Giemsa Stain

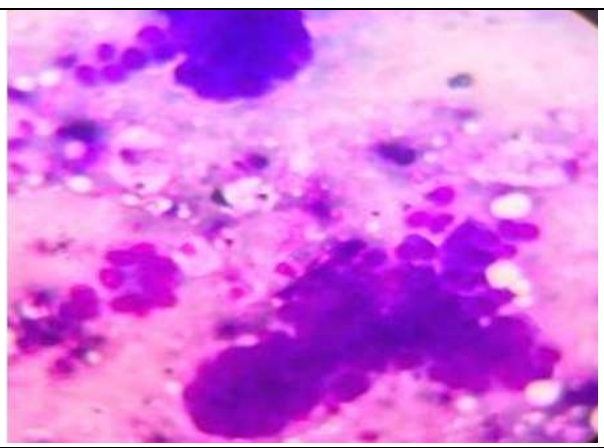

Figure 5. Microphotograph of Metastatic Adenocarcinoma showing Acinar, Papillary Pattern and also Singly Scattered. (100x). Giemsa Stain

DISCUSSION

Lymph nodes are an integral component of the immune system and lymphadenopathy are a common presentation in the clinical practice. Enlarged lymph nodes are always accessible for FNAC and therefore, this procedure is of great importance in the diagnosis of these lymphadenopathies. It plays a significant role in developing countries like India, as it is relatively a cheap procedure, simple to perform and practically has almost no complications. A round, firm, well defined lymph node or a lymph node that is fixed to the skin, deep anatomic planes, or other lymph nodes should be considered for FNA regardless of location, patient age, or symptoms. Viral, bacterial, or mycobacterial infections are the most common causes of benign regional lymphadenopathy.[3]

In the current study, majority of the cases recorded were those of reactive hyperplasia (55.7%) amongst which most of them were from the cervical group of lymph nodes. This was similar to the findings of Vimal et al where reactive lymphoid lesions comprised the majority (33.69%) followed by tubercular lymphadenitis, metastatic malignancies, acute suppurative lymphadenitis, and lymphomas, respectively. [2] Reactive hyperplasia is a common nonspecific form of lymphadenopathy due to a variety of causes ranging from bacterial, viral or nonspecific aetiology. Baji et al also had similar findings where the commonest cause of cervical lymphadenopathy was due to reactive hyperplasia.[4] This was found to be common in younger age groups lesser than 40 years. Since infections from oral cavity, ears, nose, and para nasal sinuses drain into these nodes; reactive lymphoid hyperplasia is a common finding. Aetiology is diverse and more often affects children rather than the elderly.

Tubercular lymphadenitis was diagnosed in 293 cases (40.5%) showing epithelioid granuloma with necrosis and positive acid-fast bacilli in 131 cases. The presence of caseous necrosis helps in diagnosing tuberculosis as it is more sensitive and specific to tuberculosis. In 162 cases there was epithelioid granuloma without necrosis and AFB was negative. In the study of Tariq et al in 2008 tuberculosis lymphadenitis was found to be the most common pathology of cervical lymph node lesions. AFB positivity is maximum in cases showing caseous necrosis with occasional epithelioid cells. The presence of acid-fast bacilli in smears is directly proportional to the necrosis and inversely to the granulomas. Sometimes in absence of AFB positivity the diagnosis of highly suspicious of tuberculosis was given in these lesions with strong clinical suspicion, high ESR and chest X-ray findings.[5] In under developed and developing countries where tuberculosis is very common, based on clinical history and clinical features cases of epithelioid granuloma without necrosis should be considered as tuberculosis lesions unless proven otherwise. Bezabih et al found FNAC reliable in helping to avert more invasive surgical procedures undertaken in the diagnosis of tuberculosis adenitis.[6]

In 8 cases fungal bodies, histoplasma (3 cases), Talaromyces previously known as Penicillium. Marneffei (3 cases) and 2 cases of Cryptococcus was detected. All these 8 cases were positive for HIV. Lim et al has documented the rapid diagnosis of marneffei infection by FNAC and stated that demonstration of yeast cells with a distinctive central septum confirms the diagnosis.[7] Marneffei measures 2 - 6 µm in diameter, oval and can be found either within the histiocytes or scattered throughout the tissue. On the other hand yeast cells of Histoplasma are small in size (3 - 4 µm) and divide by budding.[8,9] Classically, Cryptococcus. Neoformans on cytology smears appear as intracellular and/or extracellular tear drop-shaped or ovoid to spherical yeast-like cells, some of which show budding daughter yeast cells attached by a narrow base, with a refractile halo-like thick mucopolysaccharide capsule.[10] 19 cases showed suppurative features with numerous neutrophils and cell debris.

The study also documents higher incidence of malignancies particularly metastases in the higher age groups i.e. 61-70 years (59 cases) FNAC has a documented higher sensitivity in the diagnostic workup of metastatic malignancies which may be due to the fact that metastatic carcinoma cells are usually abundant, and their cytological features are dissimilar to that of the cells of normal or hyperplastic lymph nodes.

The pattern of metastatic deposits of squamous cell carcinoma, followed by adenocarcinomas and others are in accordance with other studies,[11,12,13,14] Metastatic squamous cell carcinoma was found in majority of the cases (61 out of 182 cases, 33.51%). Hirachand et al also noted that the commonest type of metastatic carcinoma to lymph node was of squamous cell variety.[15] Cervical lymph nodes, particularly high jugular and posterior cervical nodes, drain the head and neck and may harbour metastatic carcinomas originating in the nasopharynx, tonsillar fossa, tongue, floor of the mouth, thyroid, extrinsic larynx, facial skin, and scalp. The findings of the study support the established fact that metastatic squamous cell carcinoma of the head and neck is frequent after the age of 40. Carcinomas of the nasopharynx and oropharynx are notorious for presenting with metastases in the cervical lymph nodes while the primary neoplasm remains unnoticeable. FNAC is a useful prognostic tool in stage III cancers wherein metastasis to regional lymph nodes is usually found. It also aids in the diagnostic workup of a metastatic tumour of unknown origin.

Diagnosis of primary lymphoma by FNAC were found to be limited.[16] In our study only 13 cases of primary lymphomas were seen of which 9 were Non-Hodgkin's and 4 were Hodgkin's Lymphoma. The cytodiagnosis of Non-Hodgkin's lymphoma depends mainly on finding a relatively monomorphic population of lymphoid cells, whereas its differentiation or grading is predicted by cell size and shape, presence of nucleoli and mitotic activity. FNAC plays a greater role in the management of Hodgkin's disease as compared to NHL as it helps in the primary diagnosis, staging of the patient and monitoring the recurrence of the disease. FNAC has proven to be a simple, safe, reliable and cost-effective diagnostic tool for lymphadenopathies. It is ideal for the clinical set up in developing countries for the first line of investigation for lymphadenopathy at an approachable site however the limitations of the procedure should also be kept in mind.

CONCLUSION

FNAC of lymph nodes is a very useful and simple tool in the diagnosis of lymphadenopathies. A myriad of lesions causing lymphadenopathy can be successfully diagnosed by FNAC. In the current study, the most common causes were reactive hyperplasia, tuberculosis, and metastatic malignancies particularly squamous cell carcinoma deposits. FNAC combined with clinical correlation can be used as a first line investigation in the work up of lymph node lesions.

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