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Relative Diagnostic Efficacy, Clinical Evaluation of Fine Needle Aspiration Cytology and Biopsy of Cervical Lymphadenopathy

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Abstract

The study is carried out with a broad objective of assessing relative diagnostic efficacy of clinical evaluation, FNAC and biopsy. *Method:* FNAC was then performed and smears were made. Few air dried and few alcohol fixed smears were made. The technique of FNAC used in the present study is the same as described by Franzen, Zajicek. Removed lymph nodes (Biopsy sample) were analysed pathology department for further histopathological examination. *Result:* Sensitivity and Specificity of FNAC in diagnosing Lymphoma was 66.66% and 100% respectively while diagnostic accuracy of FNAC in lymphomas is 100%. Sensitivity of FNAC in diagnosing Tubercular lymphadenitis is 75.92%, for Reactive lymphadenitis is 100%, for metastatic secondaries is 92.85% and for lymphomas it is 66.66%. Specificity of FNAC in diagnosing Tubercular lymphadenitis is 100%, for Reactive lymphadenitis is 91.9%, for metastatic secondaries is 100% and for lymphomas it is 100%. *Conclusion:* FNAC can be deemed as a frontline investigation with further investigations onthe basis of FNAC result. However, histopathological examination remains the most dependable diagnostic tool.

Keywords: Fine Needle Cytology; Biopsy; Cervical Lymphadenopathy.

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Introduction

Cervical lymphadenopathy is a common presentation in the course of a number ofdiseases. This condition is generally not a disease by itself; rather, it may be a symptom of many possibleunderlying proble ms. The diseases can be Neoplastic or inflammatory. The prime function of lymph node is to deal with antigen, whether this be in the form of organisms or other particulate material, or even soluble antigen. Lymph nodes are strategically placed along the drainage of tissue and body fluids; they are most numerous in those areas which are in direct contact with the exterior of the individual.

There are around eight hundred lymph nodes in our body out of which not less than three hundred are cited in the neck, so enlargement of cervical lymph nodes is a common clinical condition encountered by the clinicians. As enlargment of the lymph nodes more than $1cm^2$ indicates a clinical manifestation of regional or systemic disease and serves as an excellent clue to the underlying disease [1].

Innovation in medicine is a continuous process. Use of the Fine needle aspiration biopsy for diagnosis of palpable lesions is a classical example of same. Persistant enlargment of the lymph node necessitates detailed investigations to reveal an underlying pathology. Although reasonably accurate diagnosis can be made clinically, histopathological examinations are mandatory to establish and confirm the diagnosis. These can be overcome by doing Fine needle aspiration cytology, as it is obtained easily and quickly which is simple and cheap and requires only a specialist input (cytologist) [2]. Fine needle aspiration cytology (FNAC) is the study of cells obtained through a small

gauge needle under vacuum system provided by an air tight syringe [3]. Diagnostic accuracy of FNAC increases on correlation with clinical diagnosis and histopathology (biopsy) [4].

The cytological findings of lymph nodal swellings can be correlated with clinical diagnosis and an exact decision can be made as to whether the lymph nodal swelling is due to infection, metastatic malignancy or malignant lymphoma [5].

The study is carried out with a broad objective of assessing relative diagnostic efficacy of clinical evaluation, FNAC and biopsy. Thus, protocol for early management of cervical lymphadenopathy can be evolved.

Aims and Objective

To correlate Fine Needle Aspiration Cytology (FNAC) findings with confirmed biopsy (histopathology) report.

Material & Method

Present study is an observational descriptive prospective study. The study was approved by the Institutional ethics committee, Fine Needle Aspiration Cytology (FNAC) procedure was explained to the patient in their own vernacular language and written informed consent was taken. The study was conducted at Pravara Institute of Medical Sciences, loni for 2 years.

Sample Size: 100 consecutive samples were included as per inclusion and exclusion criteria.

Inclusion Criteria

All cervical lymphadenopathy patients between 15 – 40 years of age.

Exclusion Criteria

Previously diagnosed cases and cases already undergoing Anti-tubercular treatment or anti-Retroviral treatment, post- radiotherapy were excluded from the study.

Methodology

Proper clinical history was first noted, local and systemic examination was performed and a clinical diagnosis was made. FNAC was then performed and smears were made. Few air dried and few alcohol fixed smears were made. The procedure was performed with the help of expert pathologists. The technique of FNAC used in the present study is the same as described by Franzen, Zajicek [6] and their colleagues.

Biopsy Procedure

After suitable anaesthesia, incision across the palpable lump taken and extended for 1cm beyond its margin in both direction parallel to lines of skin tension and deepened through platysma. Lymph node visualised with overlying cervical fascia. Fascia incised with clean scalpel till surface of lymph node seen. Lymph node dissected from surrounding tissue, carefully separated from surrounding structures. Handling of lymph node avoided as it may cause damage to lymph node. Haemostasis achieved. Closure done layer by layer. Removed lymph node sent to pathology department for further histopathological examination in formalin container [7].

Result

In present study 100 cases were evaluated for cervical lymph node enlargement. All cases were taken for Fine Needle Aspiration Cytology (FNAC), but in 10 cases FNAC was inconclusive. Excisional biopsy was performed in all 100 cases and finally these cases were analyzed in detail. Sex distribution in cervical lymphadenopathy: Of the 100 cases, 52 cases were males and 48 females. The sex ratio in the present study was 1.08:1 (M:F). (Table 1 and 2).

Therefore, in present study Sensitivity and Specificity of FNAC in diagnosing Tubercular Lymphadenitis was 75.92% and 100% respectively while diagnostic accuracy of FNAC in tubercular lymphadenitis is 100%. (Table 3).

In our study, Sensitivity and Specificity of FNAC in diagnosing Reactive Lymphadenitis was 100% and

Table 1: Neoplastic and Non-neoplastic cervical lymphadenopathy

Histopathological reports	No. of cases (percentage)
Neoplastic	20 (20%)
Non-neoplastic	80 (80%)
Total	100

Table 2: Fine Needle Aspiration Cytology Findings

	FNAC findings No. of cases	Biopsy findings No. cases
Tubercular lymphadenitis	41	54
Reactive lymphadenitis	32	26
Metastatic secondaries	13	14
Non-Hodgkin's lymphoma	04	01
No opinion/ Inadequate	10	05

Table 3: Sensitivity and Specificity of FNAC in diagnosing Tubercular lymphadenitis (TBL)

FNAC Findings	TBL Present on HPE	TBL Absent on HPE
Positive for TBL	41	00
Negative for TBL	13	46
Total	54	46

Table 4: Sensitivity and Specificity of FNAC in diagnosing Reactive lymphadenitis (RL)

FNAC Findings	RL Present on HPE	RL Absent on HPE
Positive for RL	26	06
Negative for RL	00	68
Total	26	74

Table 5: Sensitivity and Specificity of FNAC in diagnosing Metastatic Secondaries

FNAC Findings	Secondaries Present on HPE	Secondaries Absent on HPE
Positive for Secondaries	13	00
Negative for Secondaries	01	86
Total	14	86

91.90% respectively while diagnostic accuracy of FNAC in reactive lymphadenitis is 81.25%. (Table 4).

In our study, Sensitivity and Specificity of FNAC in diagnosing Metastatic Secondaries was 92.85% and 100% respectively while diagnostic accuracy of FNAC in metastatic secondaries in is 100%. (Table 5 and 6).

Discussion

In the present stuyd neoplastic and non-neoplastic lesions were 20 and 80% respectively. A study by Shafullah and Syed Humayun Shah et al. [8], the incidence of non-neoplastic and neoplastic lesions were 90.6% and 9.4% respectively. In study done by Adhikari [9], the incidence of non-neoplastic and neoplastic lesions were 87.2% and 12.8% respectively. (Table 7).

In the present study, tuberculosis accounted for 54% of cases, 26% turned out to be reactive lymphadenitis. Among the neoplastic lesions, malignant secondaries accounted for 14% while non-Hodgkin's lymphoma and Hodgkin's lymphoma accounted for 5% and 1% respectively. The observation made by Jha BC et al. [15] who studied 94 cases, of which tuberculosis was confirmed in 63.8% cases.Most of these studies show female predilection. Few studies like Purohit SD et al. [14] (1987), Adhikari [9] (2011) is comparable with the present study.

Shamshad Ahmad et al (2005) [16] concluded the study of FNAC in lymphadenopathy with special reference to acid fast staining in cases of tuberculosis. They found that 53.6% cases were benign reactive nature, 32.8% were tubercular etiology and 13.6% were malignant lymphadenopathy. Out of 328 cases of tubercular lymphadenopathy, Z-N positivity for acid fast bacilli was found in 152 cases (46.4%).

In the present study the sensitivity and specificity for various lesions are as below:-

In the present study, sensitivity of FNAC in diagnosing Tubercular lymphadenitis is 75.92%, for Reactive lymphadenitis is 100%, for metastatic secondaries is 92.85% and for lymphomas it is 66.66%. Specificity of FNAC in diagnosing Tubercular lymphadenitis is 100%, for Reactive lymphadenitis is 91.9%, for metastatic secondaries is 100% and for lymphomas it is 100%. (Table 8).

Diagnostic accuracy: The present study showed diagnostic accuracy of FNAC in cases of tubercular lymphadenitis is 100%, in reactive lymphadenitis is 81.25%, in metastatic secondaries and in lymphoma 100%. Histopathological examination remains the most dependable and gold standard diagnostic tool.

In our study, Sensitivity and Specificity of FNAC in diagnosing Lymphoma was 66.66% and 100% respectively while diagnostic accuracy of FNAC in lymphomas is 100%.

Table 6: Sensitivity and Specificity of FNAC in diagnosing Lymphoma

FNAC Findings	Lymphoma Present on HPE	Lymphoma Absent on HPE
Positive for Lymphoma	04	00
Negative for Lymphoma	02	94
Total	06	94

Table 7: Comparative analysis of sex distribution

	Bedi RS et al.[10] (1987)	Ammari FFet al.[11] (2003)	Dworski[12] (1989)	Dandapat MC et al.[13] (1990)	Purohit SD et al.[14] (1987)	Present study
M:F ratio	1:1.7	1:2	1:1.38	1:1.2	1.4:1	1.08:1

Table 8: Comparison of distribution of different lesions

	Tubercular Lymphadenitis	Reactivelymp hadenitis	Secondaries	Non-Hodgkin's lymphoma	Hodgkin'slymp homa
Shafullahet al.[8] (1999)	69%	17.8%	2.9%	3.4%	3.1%
Jha BCet al.[15] (2001)	63.8%	9.6%		20.7%	
Presentstudy	54%	26%	14%	5%	1%

Conclusion

FNAC can be deemed as a frontline investigation with further investigations onthe basis of FNAC result. However, histopathological examination remains the most dependable diagnostic tool. But further detailed study of FNAC techniques can be brought in routine use to emphasize the utility of ancillary technique such as special histochemical stains, cell block preparations, immunohistochemistry and flow cytometry in the interpretation of specific diagnosis of cervical lymphadenopathy.

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