Research Article

Role of FNAC in the Diagnosis of Cervical Lymphadenopathy

Bhavani C[1], M Neeraja[2], KPV Varalakshmi[3], PV Ramana Babu[4], Chaitanya B[5], Sravani P[6]

[1]Dr C. Bhavani, M.D, [2]Dr M. Neeraja, M.D., [3]Dr K.P.V. Varalakshmi, [4]Dr P.V. Ramana Babu, M.D, [5]Dr B. Chaitanya, M.D., [6]Dr P. Sravani, M.D. All are affiliated with Dr. NTR University of Health sciences, Vijayawada, Andhra Pradesh, India.

Address for correspondence: Dr C Bhavani, Email: dr.cbhavani@gmail.com

Abstract

Background: Cervical lymphadenopathy is one of the commonest presentations in inflammatory and neoplastic disorders. Fine Needle Aspiration Cytology (FNAC) is simple, quick, inexpensive and minimally invasive OPD technique used for establishing the etiology of cervical lymphadenopathy. In this study we describe cytomorphological patterns of FNAC of cervical lymph nodes and it's utility in establishing diagnosis. **Aims & Objectives:** (1) To assess the distribution of various cytomorphological patterns of cervical lymphadenopathy; (2) To assess the age specific distribution of various cytomorphological patterns of cervical lymphadenopathy. **Materials and Methods:** This study was carried out at Government Medical College and Hospital, Anantapuramu, on 265 clinically diagnosed cases of cervical lymphadenopathy over a period of three years from July 2011 to June 2014. Fine Needle Aspiration Diagnosis was correlated with details of relevant clinical findings and investigations. **Results:** Total 265 cases were studied, out of these 232 (87.55%) were found inflammatory and 33 (12.45%) were neoplastic. Tuberculosis was the most common disease found in 112 (42.26%) patients followed by reactive nonspecific lymphadenitis in 94 patients (35.47%), Metastatic tumours 30 patients (11.32%), suppurative lymphadenitis 26 patients (9.8%), Lymphoma 3 (1.13%). Highest incidence of cervical lymphadenopathy was found in patients of 21 to 40 years age group. **Conclusion:** Fine Needle Aspiration Cytology is easy, simple, safe, reliable and non-invasive procedure for diagnosis of cervical lymphadenopathy.

Keywords: Cervical Lymphadenopathy; Fine Needle Aspiration Cytology (FNAC); Cytomorphological Pattern

Introduction

Enlarged and generally asymptomatic lymph nodes often occur in the head and neck or inguinal areas and are common in clinical practice. Cervical Lymphadenopathy is usually defined as cervical nodal tissue measuring more than 1 cm in diameter. It could be due to infection, autoimmune disease or malignancy [1]. Based on the duration, cervical lymphadenopathy is further classified into acute lymphadenopathy (2 weeks duration), subacute lymphadenopathy (2-6 weeks duration), and chronic lymphadenopathy is considered in any lymphadenopathy that does not resolve by 6 weeks [2].

Fine needle aspiration cytology is a cheap and accurate first line investigation in lymphadenopathy [3]. Because of early availability of results, simplicity, minimal trauma and complications, the aspiration cytology is now considered as a valuable diagnostic aid and it provides ease in following patients with known malignancy and ready identification of metastasis or recurrence [4]. On-site evaluations can also lead to the appropriate triage for flow cytometry, microbiologic culture, and other ancillary studies [5]. The present study was carried out to know the overall prevalence of various diseases responsible for cervical lymphadenopathy.

Manuscript received: 9st Oct 2014
Reviewed: 19th Oct 2014
Author Corrected: 16th Nov 2014
Accepted for Publication: 6th Dec 2014

Materials and Methods

This is a retrospective study carried out at the cytopathology section of Government medical College, Anantapuram, India. Data concerning cervical lymph node FNAC was retrieved from the archives of three years (July 2011 to June 2014). A total of 300 patients with cervical lymphadenopathy were subjected to FNAC using 22 gauge needle and a 10 ml syringe.

The slides were wet fixed and studied using Hematoxylin and Eosin staining. Cases with purulent aspirate were followed up with Ziehl Neelsen staining. 35 cases in which cytological material was inadequate or diagnosis was equivocal were excluded from the study. Hence a total of 265 cases were available for analysis.

Based on the cytomorphological patterns observed, the cases were categorized into the following groups:

1) Reactive hyperplasia : Smears were very cellular, showing a polymorphous population of lymphoid cells and histiocytes
2) Suppurative lymphadenitis: Smears after aspiration of purulent material showing plenty of polymorphs with few lymphocytes and negative for acid fast bacilli.
3) Tuberculous lymphadenitis: epithelioid granulomas with or without caseous necrosis and giant cells. Smears showing only caseous material were also grouped under this category.
4) Metastatic malignancy: Malignant cells arranged in clusters or discretely along with other lymphoid cells. Metastatic carcinoma was subdivided according to cytological features.
5) Lymphomas : Both Hodgkin's and Non Hodgkin's lymphoma

Results

In this study 300 patients were subjected to FNAC for cervical lymphadenopathy. Among these patients, in 25 cases, the aspirate was inadequate despite repeated endeavours and in 10 cases the opinion offered was equivocal. Hence, these 35 cases were excluded from the study.

There were 124 males and 141 females in the study. The male: female ratio in this study was 0.88:1, with a slight female preponderance. The age at presentation ranged from 6 months to 85 years with mean age in the middle of third decade. Maximum number of patients were in the 21 – 40 years age group (107 cases, 40.37%) followed by the age group 0 – 20 years (94 cases, 35.47%).

Reactive lymphoid hyperplasia was noted in 94 patients (35.47%). Among these patients 43 patients were in 0 – 20 age group and 42 patients in 21 – 40 age group. Suppurative lymphadenitis was noted in 26 cases with majority (10) of cases in 21 – 40 age group. Tuberculous lymphadenitis accounted for a total of 112 cases (42.26%).

This was the most common presentation of cervical lymphadenopathy in the current study. Granulomatous inflammation with coexistent caseous necrosis was the dominant sub category in this group accounting for 64.2% (72 cases). Cold abscess, a delayed presentation of tuberculosis was noted in 14 cases (12.5%). Metastatic malignancy was observed in 30 cases (11.32%) with squamous cell carcinoma topping the incidence (23 cases, 76.66%). One case of Hodgkin's lymphoma & 2 cases of Non Hodgkin's lymphoma were diagnosed.

Table 1: Summary of FNAC of cervical lymphadenopathy

Age (Years)	Sex	Reactive lymphadenitis	Suppurative lymphadenitis	TB			Metastatic malignancy	Hodgkin's lymphoma	Non Hodgkin's lymphoma
				G	NG	C			
0-20	M	24	5	5	11	1	-	-	1
0-20	F	19	3	8	14	3	-	-	
21-40	M	10	6	-	15	3	3 (SCC)	-	1
21-40	F	32	4	9	18	4	1 (ADC)	1	-
41-60	M	1	2	1	4	1	11 (SCC) 1 (Papillary Ca)	-	-
41-60	F	6	2	2	9	1	2 (SCC) 1 (PDC) 1 (Papillary Ca)	-	-
61-80	M	1	4	1	1	1	6 (SCC) 2 (ADSC) 1 (PDC)	-	-
61-80	F	1	-	-	-	-	-	-	-
81-100	M	-	-	-	-	-	1 (SCC)	-	-
81-100	F	-	-	-	-	-	-	-	-
TOTAL		94 (35.47%)	26 (9.8%)	26 (9.8 %)	72 (27.17 %)	14 (5.28%)	30 (11.32%)	1 (0.38%)	2 (0.75%)

TB Lymphadenitis, G : Granulomatous, NG : Necrotizing Granulomatous, C : Cold abscess (Only Caseous necrosis) Metastatic malignancy : SCC – Squamous Cell Carcinoma, ADC – Adenocarcinoma, ADS – Adenosquamous carcinoma, PDC – Poorly differentiated carcinoma.

Table 2: Comparison of current study with other studies evaluating causes for cervical lymphadenopathy

Author	Total cases	Reactive lymphadenitis	TB lymphadenitis	Malignancy (Primary & Metastatic)	Others
Current study 2014	265	94	112	33	26
Renuka Khuba 2012	50	10	08	03	13
Vapi et al 2011	34	10	08	03	13
Tariq et al 2008	100	18	36	14	32
V.Koo et al 2006	18	00	05	06	07
Meera bai 2004	50	03	31	16	00

Discussion

Localized or regional lympadenopathy is defined as the enlargement of lymph nodes within contiguous anatomic regions. A round, firm, well-defined lymph node that is present for more than 8 weeks, 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, depending on the world region, are the most common causes of benign regional lymphadenopathy. The well-defined role of FNAC in the investigation of lymphadenopathy has previously been studied [6].

In the current study, 232 out of 265 cases (87.54%) were benign in nature whereas 33 cases (12.46%) had a malignant Pathology. Among the benign causes of lymphadenopathy, the most common was tuberculosis accounting for 112 cases (42.26%) followed by reactive lymphadenitis (94 cases, 35.47%).

The high incidence of TB in the study may be due to the endemicity of the disease in India. Moreover the most common form of extrapulmonary tuberculosis is tuberculous lymphadenitis with cervical lymph nodes being the most commonly involved group. In a study of 1396 cases of FNAC of cervical lymphadenopathy, Ramesh kumar found the most common benign lesion to be tuberculosis (54%) [7]. Bezabih et al found FNAC reliable in helping to avert more invasive surgical procedures undertaken in the diagnosis of tuberculous adenitis. They suggested adding Ziehl Neelsen stain for identification of acid-fast bacilli as an adjunct to increase the diagnostic accuracy of tuberculous lymphadenitis [8]. In the study of Tariq et al in 2008 tuberculous lymphadenitis was found to be the most common pathology of cervical lymph node lesions [9].

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.

The second most common cause of cervical lymphadenopathy in the study was due to reactive hyperplasia. This was found to be common in younger age groups i.e less 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 [10]. Etiology is diverse and more often affects children rather than the elderly.

The study also documents higher incidence of malignancies particularly metastases in the higher age groups i.e 41 -60 years and 61 – 80 years. 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 cytologic features are dissimilar to that of the cells of normal or hyperplastic lymph nodes [11,12]

Metastatic squamous cell carcinoma was found in majority of the cases (23 out of 30 cases, 76.67%). Hirachand et al also noted that the commonest type of metastatic carcinoma to lymph node was of squamous cell variety [13]. Cervical lymph nodes, particularly high jugular and posterior cervical nodes, drain the head and neck and may harbor 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. In cases of squamous cell carcinoma in an upper cervical lymph node, panendoscopy is indicated, including biopsy of all suspected areas and blind biopsies of the common primary sites—nasopharynx, tonsil, base of the tongue, supraglottic larynx, and piriform sinus [14].

Carcinomas of the nasopharynx and oropharynx are notorious for presenting with metastases in the cervical lymph nodes while the primary neoplasm remains unnoticeable [15]. In our institution clinical workup after FNAC diagnosis of metastatic deposits showed that majority of the cases had a primary origin in nasopharynx.

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 tumor of unknown origin. The suggested protocol for the management of patients with cervical lymphadenopathy without an obvious primary site of origin starts with fine needle aspiration to establish a cytologic diagnosis.

In recent years, FNAC of lymph nodes supplemented by ancillary studies has been increasingly accepted as an approach for primary diagnosis of reactive lymphoid lesions and lymphomas [16,17].

This argument is made stronger for patients in whom the site of disease is not easily accessible, such as the retroperitoneum, because diagnostic FNAC results can preclude the need for excisional biopsy [18]. In our study only 3 primary lymphomas (1 Hodgkin's and 2 Non Hodgkin's) were diagnosed on cervical node FNAC.

Conclusion

A myriad of lesions causing cervical lymphadenopathy can be successfully identified on FNAC. In the current study, the most common causes were tuberculosis, reactive hyperplasia and metastatic malignancies particularly squamous cell carcinoma deposits.

FNAC combined with clinical correlation can be used as a first line investigation in work up of lymph node lesions. Further management depending upon the cause can be suitably guided by this simple, cost effective procedure.

Funding: Nil, **Conflict of interes**t: None
Permission from IRB: Yes

References

1. Mukul Patar , Kusum Borsaikia , Biraj K. Das , Anupam Hazarika. A clinicopathological evaluation of cervical lymphadenopathy in children (0-14 Years) By fine needle aspiration cytology and histopathological examination - A hospital based study. National Journal of Otorhinolaryngology and Head & Neck Surgery.2014; 2(11):12-14

2. Allhiser JN, McKnight TA, Shank JC. Lymphadenopathy in a family practice. J.Fam Pract. 1981 ; 12 (1) :27-32.

3. Steel BL, Schwartz MR, Ramzy I. Fine needle aspiration biopsy in the diagnosis of lymphadenopathy in 1,103 patients: role, limitations, an analysis of diagnostic pitfalls. Acta Cytol .1995;39(1):76-81.

4. Ghartimagar D, Ghosh A, Ranabhat S, Shrestha MK, Narasimhan R, Talwar OP. Utility of fine needle aspiration cytology in metastatic lymph nodes. Journal of Pathology of Nepal.2011;1(2):92-95.

5. Saleh H, Masood S. value of ancillary studies in fine needle aspiration biopsy. Diagn Cytopathol 1995;13(4):310-5.

6. McAdams HP,Rosado-de- 1.A.G.Gonshal. . Diagnosis of Tuberculosis. Journal of Indian Medical Association.2000;98(3):57-61.

7. Ramesh kumar K. Tuberculosis lymphadenitis in children- role of fine needle aspiration cytology. J Assoc Physicians India.1999;47(10):976-979.

8. Bezabih M, Mariam DW, Selassie SG.. Fine needle aspiration cytology of suspected tuberculous lymphadenitis.Cytopathology.2002;13(5):284-290.

9. Tariq Ahmad, Mohammad Naeem, Siddique Ahmad, Ambreen Samad. Fine Needle Aspiration Cytology (FNAC) And Neck Swellings In The Surgical Outpatient, J Ayub Med Coll Abbottabad 2008; 20(3): 30-32.

10. Shakera N Baji, Vaishali Anand, Richa Sharma, Kunal S Deore, Mital Chokshi. Analysis of FNAC of cervical lymph nodes: experience over a two years period. International Journal of Medical Science and Public Health.*2014;3(5):607-609.*

11. Frable WJ. Fine-needle aspiration biopsy: a review. Hum Pathol 1983;14(1):9–28.

12. Volmar KE, Singh HK, Gong JZ. The advantages and limitations of the role of core needle and fine needle aspiration biopsy of lymph nodes in the modern era. Hodgkin and non-Hodgkin lymphomas and metastatic disease. Pathology Case Rev 2007;12(1):10–26.

13. Hirachand S, Lakhey M, Akhter J, Thapa B. Evaluation of fine needle aspiration cytology of lymph nodes in Kathmandu Medical College, Teaching hospital. Kathmandu University Medical Journal .2009;7(26):139-142.

14. Vokes EE, Weichselbaum RR, Lippman SM. Head and neck cancer. N Engl J Med 1993;328(3):185–194.

15. Loke YW. Lymphoepitheliomas of the cervical lymph nodes. Br J Cancer 1965;19(3):482–485.

16. Mathiot C, Decaudin D, Klijabienko J, et al. Fine-needle aspiration cytologic combined with flow cytometry immunophenotyping is a rapid and accurate approach for the evaluation of suspicious lymphoid lesions. Diagn Cytopathol 2006;34(7):472–478.

17. Venkatraman L, Catherwood MA, Patterson A, et al. Role of polymerase chain reaction and immunocytochemistry in the cytological assessment of lymphoid proliferations. J Clin Pathol 2006;59(11): 1160–1165.

18. Chen L, Kuriakose P, Hawley RC, et al. Hematologic malignancies with primary retroperitoneal presentation: clinicopathologic study of 32 cases. Arch Pathol Lab Med 2005;129 (5):655–660.

.....

How to cite this article?

Bhavani C, M Neeraja, KPV Varalakshmi, PV Ramana Babu, Chaitanya B, Sravani P. Role of FNAC in the Diagnosis of Cervical Lymphadenopathy. *Int J Med Res Rev* 2014;2(6):599- 603. doi:10.17511/ijmrr.2014.i06.15

.....