ISSN NO. 2320-5407

Journal homepage: http://www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH

RESEARCH ARTICLE

STUDY OF CYTODIAGNOSIS OF LYMPHNODE NEOPLASTIC LESIONS AND COMPARISION WITH HISTOPATHOLOGY

Dr. Kalpesh Kubavat[1], Dr. Chintan Soni[2], Dr. Alpesh Patel[3], Dr. Harshid L. Patel[4]

1. Assistant Professor, Dept. of Pathology, Gujarat ADANI Institute of Medical Science, Bhuj-Kutch, Gujarat.
2. Assistant Professor, Dept. of General Surgery, Gujarat ADANI Institute of Medical Science, Bhuj-Kutch, Gujarat.
3. Consultant Pathologist, SHARDA Pathology Laboratory, Gandhinagar, Gujarat.
4. Associate Professor, Dept. of Pathology, GMERS Medical College, Dharpur-Patan, North Gujarat.

Manuscript Info

Manuscript History:

Received: 14 May 2015
Final Accepted: 25 June 2015
Published Online: July 2015

Key words:

Fine Needle Aspiration Cytology (FNAC), Histopathological Confirmation, Lymphnode Neoplastic Lesions, Lymphadenopathy

Corresponding Author

Dr. Kalpesh Kubavat

Abstract

Background: The development of aspiration cytology is one of the biggest advances in anatomic pathology. Cancer has become one of the ten leading causes of death in India. The advantages of FNAC are : it is safe, gives a rapid report, is sensitive and specific for the diagnosis of malignancy, requires little equipment, causes minimal discomfort to the patient, is an outpatient procedure, avoids the use of frozen section, reduces the rate of exploratory procedures, allows a definitive diagnosis of inoperable cases, is repeatable and cost effective. Fine needle aspiration cytology is of particular relevance in lymphnodelesions because of easy assessibility, excellent patient compliance, minimally invasive nature of procedure and helping to avoid surgery in non-neoplastic lesions, inflammatory conditions and also some tumors.

Aims and Objectives: To test the utility of FNAC, to establish the diagnostic accuracy of cytology by comparison with histopathology diagnosis and to establish the sensitivity and specificity of this technique in lymphnode neoplastic lesion.

Materials and Methods: The present study was undertaken in the Department of Pathology, Government medical college and hospital, Nashik between January 2008 – June 2009. All cases were studied with initial clinical evaluation, followed by fine needle aspiration cytology and subsequent histopathology wherever needed.

Results: In the present study, total of 584 aspirates from lymphnode lesions were studied for cytopathological examination and correlated with histopathology where needed. Out of the total 584 cases of thyroid lesions, 367 cases (62.84%) were non-neoplastic and 217 cases (37.16%) were neoplastic. Of the total 217 cases with neoplastic lymphnode lesions, 169 cases (77.88%) were male and 48 cases (22.12%) were female. Males were more commonly affected. The male to female ratio was 3.5:1. Most common neoplastic lesion of the lymphnode on cytologic diagnosis was found to be metastatic lesions (81.57%). Out of total 177 cases of metastatic deposits, 148 cases (83.60%) were of squamous cell carcinoma. Most common age group affected was found to be more than 60 years age group (37.33%) and metastatic deposit was found most commonly in this age group (40.68%).

Summary and Conclusion : Excisional biopsy remains the gold standard for diagnosis of lymphnode neoplastic lesion, cytological study can establish the diagnosis of the majority of lymphanode neoplasm and can be recommended as an adjunct to histopathology. As the age increases, the chance for lymphnode malignancy is also increases.

.....

INTRODUCTION

Lymphadenopathy is one of the commonest clinical presentations of patients attending the outdoor department of a hospital. Lymph nodes comprise an important part of the defense system of the human body. They become secondarily involved in virtually all infectious diseases and in many neoplastic disorders. Lymph node aspiration is of great value in diagnosis of lymphadenitis, lymphomas and metastatic carcinoma [1, 2].

Cytopathology is defined as the study of cells that have exfoliated freely from tissue surfaces or that have been collected by brushing, scraping, washing or by needle aspiration. The idea to obtain cells and tissue fragments through a needle introduced into the abnormal tissue was by no means new. Already in the mid nineteenth century, Kun (1847), Lambert (1851), Mentrier (1886) employed needles to obtain cells and tissue fragments to diagnose cancer [3].

Fine needle aspiration (FNA) of the lymphnode has been utilized as a diagnostic method for 40 years. The method was introduced by Söderström in 1952, has been extensively used in Sweden and shown to be both dependable and accurate. FNAC of lymphnode for cytological diagnosis of diseases of lymphnode was first reported by Martin and Ellis of memorial hospital for cancer and allied diseases, New York in 1930. Early recognition and categorization of the diseases is mandatory if an increased number of cures are to be achieved [4].

Cancer has become one of the ten leading causes of death in India. Head and neck neoplasia including lymphnode neoplasms is a major form of cancer in India, accounting for 23% of all cancers in males and 6% in females [5,6]. Fine needle aspiration cytology is of particular relevance in the lymphnode region because of easy accessibility of target sites. FNAC in this region is easy because of excellent patient compliance, due to the minimally invasive nature of the technique and the important aspect of avoidance of surgery in situations like non neoplastic or inflammatory conditions and metastatic tumours.

Lesions of lymphnode are comprised of inflammatory, infective, vascular, cystic, benign or malignant neoplasm or a metastatic tumour. Lymphnode neoplastic lesions commonly reported on cytology are Lymphoreticular malignancies, Metastatic deposits, Leukemic infiltrates and some Suspicious lesions. FNAC is of particular relevance in the lymphnode area because of easy accessibility of the target site, excellent patient compliance, minimally invasive nature of the procedure and helping to avoid surgery in non-neoplastic lesions, inflammatory conditions and also some tumors [7].The FNAC has a accuracy rate exceeding 92%.

The advantages of FNAC are that it is safe, gives a rapid report, is sensitive and specific for the diagnosis of malignancy, requires little equipment, causes minimal discomfort to the patient, is an out-patient procedure, reduces bed occupancy, allows pre-operative diagnosis, avoids the use of frozen section, reduces the rate of exploratory procedures, allows a definitive diagnosis of inoperable cases, is repeatable and cost effective.

Correlation of cytological diagnosis with histopathological findings in the surgical specimen aids in developing a level of comfort with the pathologist's cytological interpretation [8]. Stewart's opinion of the technique is still valid today as it was in1933 when he stated "diagnosis by aspiration is as reliable as the combined intelligence of the clinicians and pathologists makes it."

AIMS AND OBJECTIVES

1. To test the utility of FNAC in diagnosis of lymphnode neoplastic lesions.
2. To establish the diagnostic accuracy of cytology by comparative study with histopathological diagnosis.
3. To establish the sensitivity and specificity of this technique in lymphnodeneoplastic lesions.

MATERIALS AND METHOD

The present study was undertaken in the Department of pathology, Government medical college and hospital, Nashik between January 2008 – June 2009. Approval from the institutional ethical committee and from ethical committee of Maharashtra University of health sciences (MUHS), Nashik was taken before commencing study.

The patients presented with superficially palpable lymphnode lesion, patient admitted in hospital ward of this institute with clinical diagnosis of any lymphnode neoplastic lesions and patients attending cytological OPD in a private laboratory with lymphnode lesion were selected for this study.

FNAC was done in cytology section of central clinical laboratory or in respective ward in which the patient was admitted. The method of fine needle aspiration cytology used in the present study is same as described by Franzen and their colleagues. Aspiration was carried out using 20ml disposable syringe with 23-25 gauze needle attached to Franzen's aspiration handle. Two or three wet smears were prepared following the guidelines laid down in Koss's Diagnostic Cytology and its Histopathologic basis [3]. Then smears were fixed in 95% ethyl alcohol and others were air dried and routinely stained with Papanicalaou (PAP) / Haemotoxylin and Eosin (H&E) stains.

The received post-operative surgical specimen were fixed in 10% neutral formalin and subjected to gross examination, processing, paraffin embedding, section cutting, staining by H&E and mounting by DPX. The cytomorphological features of various diseases were studied. FNAC and HPE of the same lesion were correlated where available.

RESULTS

Table : 1 : Lesions and Sex wise distribution ofLymphnode Neoplastic Lesions.

Sr. No.	Lesions	Total (%)	Male (%)	Female (%)
1	Lymphoreticular Malignancy	28 (12.90)	14 (50.0)	14 (50.0)
2	Metastatic Deposits	177 (81.57)	147 (83.05)	30 (16.95)
3	Leukemic Infiltrates	03 (01.38)	03 (100.0)	00 (-----)
4	Suspicious Lesions	09 (04.15)	05 (55.56)	04 (44.44)
	Total	217 (100.0)	169 (77.88)	48 (22.12)

Table : 2 : Age wise distribution of Lymph node Neoplastic Lesions.

Lesions	00-10	11-20	21-30	31-40	41-50	51-60	>60	Total
Lymphoreticular Malignancy	02	06	03	04	03	05	05	28
%	07.14	21.43	10.71	14.29	10.71	17.86	17.86	
Metastatic Deposites	00	00	08	18	22	57	72	177
%	----	----	04.52	10.17	12.43	32.20	40.68	
Leukemic Infiltrates	01	02	00	00	00	00	00	03
%	33.33	66.67	----	----	----	----	----	
Suspicious Lesions	00	00	01	02	01	01	04	09
%	----	----	11.11	22.22	11.11	11.11	44.45	
Total	03	08	12	24	26	63	81	217
%	01.38	03.69	05.53	11.06	11.98	29.03	37.33	

In the present study, total of 584 aspirates from lymphnode lesions were studied for cytopathological examination and correlated with histopathology where needed. Out of the total 584 cases of thyroid lesions, 367 cases (62.84%) were non-neoplastic and 217 cases (37.16%) were neoplastic. Of the total 217 cases with neoplastic lymphnode lesions, 169 cases (77.88%) were male and 48 cases (22.12%) were female. Males were more commonly affected. The male to female ratio was 3.5:1.Most common neoplastic lesion of the lymphnode on cytologic diagnosis was found to be metastatic lesions (81.57%) followed by lymphoreticular malignancy (12.90%), followed by suspicious lesions (4.15%) followed by leukemic infiltrates (1.38%).

Out of total 177 cases of metastatic deposits, 148 cases (83.60%) were of squamous cell carcinoma, 22 cases (12.43%) were of undifferentiated carcinoma, 03 cases (01.70%) were of adenocarcinoma, 02 cases (01.13%) were of papillary carcinoma, 01 case (00.57%) each was of malignant melanoma and invasive ductal carcinoma of breast. Most common age group affected was found to be more than 60 years age group (37.33%) and metastatic deposit was found most commonly in this age group (40.68%). About two third cases of neoplastic lymph nodes were above 50 years age group accounting for 144 (66.36%) cases. As the age increases, the chance for lymphnode malignancy is also increases. The mean age group for thyroid neoplastic lesion in the present study was 50.67 years.

Many cases of lymph node neoplastic lesions were selected for cytohistological correlation. In the present study, out of the total 217 aspirates,48 (22.12%) cases were available for follow-up and histopathology. Out of these 48 follow up cases, in 44 (91.67%) cases cytological diagnosis was same as histopathological diagnosis whereas in 04 (08.33%) cases the cytologic diagnosis and final histopathological diagnosis were different. Out of these 48 follow up cases, 03 were diagnosed as lymphoreticular malignancy (02 NHL and 01 HL), 38 were diagnosed as squamous cell carcinoma, 01 each was diagnosed as adenocarcinoma and malignant melanoma, 03 were diagnosed as undifferentiated carcinoma and 02 were diagnosed as suspicious of malignancy on cytopathological examination. Out of these 48 follow up cases, 44 cases were consistent with cytological diagnosis and 04 cases were inconsistent with cytological diagnosis. Out of these 04 cases which were not consistent with cytopathological diagnosis, each case found to be of hodgkin's lymphoma, squamous cell carcinoma grade 3, metastasis from anaplastic carcinoma of thyroid and metastasis from squamous cell carcinoma of tongue.

Table : 3 Comparision of present study with other studies.

Sr. No.	Auther	Year	Total Cases	Metastatic Lesions (%)	Other Lesions (%)
1	Russ et al [9]	1978	048	39 (81.25)	09 (18.75)
2	Frable and Frable [10]	1979	194	171 (88.14)	23 (11.34)
3	Bhaskaran CS et al [11]	1990	069	45 (65.21)	24 (34.78)
4	Malarkar et al [12]	1991	028	19 (67.86)	09 (32.14)
5	Serrano Egea et al [13]	2002	220	160 (72.72)	60 (27.28)
6	Garber C et al [14]	2008	070	58 (82.86)	12 (17.14)
7	Present Study	2009	217	177 (81.57)	40 (18.43)

DISCUSSION

The present study was carried out at Department of Pathology, Government medical college and hospital, Nashik from January 2008 to June2009. Total of 217 aspirates of lymphnode neoplastic lesions were studied to test the efficacy and overall utility of cytology in the lymphnode neoplastic lesions. Detailed clinical examination, cytopathology examination and histopathology in the available cases were done to reach the definitive diagnosis.

In study of Russ et al [9], out of total 48 neoplastic lymphnode aspirates, 39 (81.25%) were metastatic lesions and 09 (18.75%) were other lesions. In study of Frable and Frable [10],out of total 194 neoplastic lymphnode aspirates, 171 (88.14%) were metastatic lesions and 23 (11.34%) were other lesions. In study of Bhaskaran CS et al [11], out of total 69 neoplastic lymphnode aspirates, 45 (65.21%) were metastatic lesions and 24 (34.78%) were other lesions. In study of Malarkar et al [12], out of total 28 neoplastic lymphnode aspirates, 19 (67.86%) were metastatic lesions and 09 (32.14%) were other lesions. In study of Serrano Egea et al [13], out of total 220 neoplastic lymphnode aspirates, 160 (72.72%) were metastatic lesions and 60 (27.28%) were other lesions. In study of Garber C et al [14], out of total 70 neoplastic lymphnode aspirates, 58 (82.86%) were metastatic lesions and 12 (17.14%) were other lesions. In present study, out of total 217 neoplastic lymphnode aspirates, 177 (81.57%) were metastatic lesions and 40 (18.43%) were other lesions.

Engzell et al [15] reported 64.8% squamous cell carcinoma which metastasize to lymphnode. Min Hee huh et al [16] reported 73.9% % squamous cell carcinoma which metastasize to lymphnode. JF Nasuti et al [17] reported 80.5% squamous cell carcinoma whichmetastasize to lymphnode. In present study, out of total 177 cases of metastatic aspirates, 148 cases (83.60%) were of metastatic squamous cell carcinoma.

In the present study males were more commonly affected 169 (77.88%)compared to females 48 (22.12%) cases. Male to female ratio was found to be 3.5:1. In study of Steel, Schwartz and Ramzy [18] male to female ratio was found 2.5:1. In the present study metastatic lesion were more common in the >60 years age group **(**40.68%). The mean age group was found to be 50.67 years. In study of Steel, Schwartz and Ramzy [18] and Thomas et al [19],mean age was of 55.2 years and 49.6 years respectively.

JF Nasuti et al [17] reported 49 cases of NHL on cytology of which 1 casewas diagnosed on histopathology as Hodgkin's lymphoma. JF Nasuti et al [17]observed 94% correlation was reported between cytology and histology.RashmiKumari et al [20] reported 3 cases of Hodgkin's lymphoma reported as lymphoproliferativedisease on FNAC, 2 cases reported as reactive lymphadenopathy.

D. Malakar et al [12]showed the sensitivity of FNAC in lymphomas tobe 100.00% and a specificity of 100%. In secondaries the sensitivity was 94.7%and specificity was 100.00%.Steel, Schwartz and Ramzy [18] showed that the accuracy in nonhematolymphoid malignancies was 96% in carcinomas and 100% in melanomas. Cheng and Dorman [21] reported sensitivity of 84%, specificity of 100%,and efficiency of 88% of FNAC of lymph node lesions. Jandu and Webster [22] showed a sensitivity of 96.2%, specificity of 87.5%, and an accuracy of 94.2% lymph node FNAC. JF Nasuti et al [17]observed that carcinomas were the commonest metastatic tumours. Surgical biopsy subsequently showed 94% correlation between cytology and histopathology. Serrano Egea et al [13] found the sensitivity as 94.1% with specificity96.9%. In cases with non-lymphoid malignancies of the lymph node the sensitivity was 98.8% and specificity was 100%. In present study, sensitivity of FNAC in neoplastic lymphadenopathy wasfound to be 100%.

CONCLUSION

We recommend that FNAC to be a safe and reliable technique in diagnosis lymphoid malignancies. It is a quick, convenient and accurate method of tissue diagnosis and should be considered as first line investigation in the evaluation of lesions in lymphoid malignancy.

This cytological study of lymphoid neoplastic lesions showed that, FNAC is a simple, rapid, safe, atraumatic procedure, free of complications, cost effective, virtually painless and is well tolerated by the patient including the pediatric population and on an out-patient basis.

It is useful in diagnosis of various lymphnode neoplastic lesions and can be used as a screening procedure to decide further mode of management. It is extremely useful in debilitated, old patients in whom biopsy is not desirable. It is useful diagnostic procedure for follow-up cases and recurrences. Multiple lesions can be studied simultaneously. It is very useful in cases of metastasis with known malignancies as biopsy can be avoided.

Thus to conclude, while excisional biopsy remains the gold standard for diagnosis of lymphoid neoplastic lesion, cytological study can establish the diagnosis of the majority of lymphoid neoplastic lesions and can be recommended as an adjunct to histopathology.

ACKNOWLEDGEMENT

The authors thank to all the patients, all staffs of cytopathology and histopathology department of Shree Shankar Rao Chavan Government Medical College and Hospital, Nanded, Maharashtra.

BIBLIOGRAPHY

[1] Gupta AK, Nayar M, Chandra M. Reliability and limitations of fine needle aspiration cytology of lymphadenopathies. An analysis of 1,261 cases. Acta Cytol1991; 35(6): 777-783.
[2] Thomas JO, AdeyiD, Amanquno H. Fine needle aspiration in the management of peripheral lymphadenopathy in a developing country. Diagn Cytopathol 1999; 21(3): 159-162.
[3] Koss LG, Melamed MR, Caraway NP, Katz RL. Lymphnodes. In: Koss's Diagnostic Cytology and its Histopathologic basis. 5th ed. Philadelphia, Lippincott Williams and Wilkins, 2006, pp 1186-1228.
[4] Joseph E. Russ, Edward F. Scanion, Miriam A. Christ. Aspiration cytology of head and neck masses. Am J Surg 1978;136(3):342-347.
[5] Hemant Ahluwalia, SC Gupta, Mangal Singh, Vatsla Mishra, PA Singh, DK Walia. Spectrum of Head and Neck Cancers at Allahabad. Indian J Otolaryngol Head Neck Surg 2001;53(1):16-20.
[6] Mehrotra Ravi, Singh Mamata, Gupta Raj Kishore, Singh Manish, Kapoor Anil K. Trends of prevalence and pathological spectrum of head and neck cancers in North India. Indian Journal of Cancer 2005;42(2):89-93.
[7] AndleebAbrari, S. Shamshad Ahmad, VandanaBakshi. Cytology in the otorhinolaryngologist's domain – a study of 150 cases, emphasizing diagnostic utility and pitfalls. Indian J Otolaryngol Head Neck Surg 2002;54(2):107-110.
[8] Amedee RG and Dhurandhar NR.Fine-Needle Aspiration Biopsy. The Laryngoscope 2001;111:1551–1557.
[9] Joseph E. Russ, Edward F. Scanion, Miriam A. Christ. Aspiration cytology of head and neck masses. The American Journal of Surgery 1978;136(3):342-347.
[10] Frable WJ, Frable MA. Thin-needle aspiration biopsy: the diagnosis of head and neck tumors revisited. Cancer 1979;43(4):1541-1548.
[11] Bhaskaran CS, Kumar GH, Sreenivas M, Kameswari R, Rao G, Aruna CA et al. Fine needle aspiration cytology review of 1731 cases. Indian J Pathol Microbiol 1990;33(4):387-397.
[12] Malakar D, ILN Jajoo, Kiran Swarup, Gupta OP, Jain AP, Poflee VW. A clinical evaluation of fine needle aspiration cytology in the diagnosis of lymphadenopathy. Ind J Tub 1991;38:17-19.
[13] Serrano Egea A, Martinez Gonzalez MA, Perez Barrios A, AlbertiMasqrau N, de Aqustin P. Usefulness of light microscopy in lymph node fine needle aspiration biopsy. Acta Cytol 2002;46(2):364-368.
[14] Garbar C, Remmelink M, Mascaux C. Fine needle aspiration cytology of lymph node: experience of 2 university hospitals with conventional smears and liquid-based cytology. Acta Cytol 2008;52(4):418-423.
[15] Engzell U, Jakobsson PA, Sigurdson A, Zajicek J. Aspiration biopsy of metastatic carcinoma in lymph nodes of the neck. A review of 1101 consecutive cases.Acta Otolaryngol 1971;72(1):138-147.
[16] Min Hee Huh, SeongHeum Park, HeeJin Chang, Jung Il Suh, Kyung Woo Choi. Fine needle aspiration biopsy for metastatic cervical lymphadenopathy. J Korean Cancer Assoc 1998;30(5):963-939.
[17] Nasuti JF, Yu G, Boudousquie A, Gupta P. Diagnostic value of lymph node fine needle aspiration cytology: an institutional experience of 387 cases observed over a 5-year period. Cytopathology 2000;11(1):18-31.
[18] Steel BL, Schwartz MR, Ramzy I. Fine needle aspiration biopsy in the diagnosis of lymphadenopathy in 1,103 patients. Role, limitations and analysis of diagnostic pitfalls. Acta Cytol 1995;39(1):76-81.
[19] Thomas JO, Ladipo JK, Yawe T. Histopathology of lymphadenopathy in a tropical country. East Afr Med J 1995;72(11):703-705.
[20] RashmiKumari TR, Rajalakshmi T. Fine needle aspiration cytology in the diagnosis of Hodgkin lymphoma: Hits and misses. J Cytol 2008;25:10-12.
[21] Cheng AT, Dorman B. Fine needle aspiration cytology: the Auckland experience. Aust N Z J Surg 1992;62(5):368-372.
[22] Jandu M, Webster K. The role of operator experience in fine needle aspiration cytology of head and neck masses. Int J Oral Maxillofac Surg 1999;28(6):441-444.