ORIGINAL ARTICLE

Measure of Agreement between Doppler Ultrasound Neck and FNAC for Diagnosis of Cervical Lymphadenopathy

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ABSTRACT

Background: Lymphatic system of body is widely distributed and Lymph nodes are the easily accessible part of lymphoid system. They are an important part of physical examination and palpable lymph nodes guide towards diagnosis of many diseases including lymph proliferative disorders. Palpable lymph nodes doesnot always indicate disease but it reflects frequent exposure to new antigens. It is important to assess nodal status in many malignant conditions including head and neck carcinoma where it predict prognostic value as well. Doppler ultrasound has its own significance in detecting cervical lymphadenopathy and FNAC provides tissue diagnosis.
Aim: To determine the frequency of patients who require agreement between Doppler ultrasound and FNAC for diagnosis of cervical lymphadenopathy.
Study design: Cross sectional.
Setting: This study was conducted at Sh. Zayed Hospital in two departments in collaboration, including department of radiology and pathology.
Duration of study: study conducting from 8 October 2010 to 8 April 2011.
Results: A total of 75 cases were enrolled in study who fulfilled inclusion and exclusion criteria. Majority of them were between 31-40 years i.e., 22(29.33%), mean and standard deviation was calculated as 34.51±3.62 years, 42(56%) male and 33(44%) were females, frequency of agreement between Doppler ultrasound and FNAC for diagnosis of cervical lymphadenopathy was 66(88%) while 9(12%) had no agreement.
Conclusion: We concluded higher frequency of agreement between Doppler ultrasound and FNAC for the diagnosis of cervical lymphadenopathy.
Keywords: Cervical lymphadenopathy, diagnosis, Doppler ultrasound, FNAC, agreement.

INTRODUCTION

A lymph node is specifically defined as encapsulated lymphoid tissue with a peripheral sinus.[1] Lymph nodes larger than 1 cm in diameter are generally considered abnormal.[2] Annual incidence or unexplained lymphadenopathy in general population is 0.6%.[3,4] Most common site is neck. Magnitude of cervical lymphadenopathy is 55%.[5] Cervical lymphadenopathy is commonly caused by tuberculosis, reactive hyperplasia, lymphoma and metastases.[6-8] Metastatic cervical lymph nodes are common in patients having cancers of head and neck and is critically important in non-head and neck cancers because presence of nodal metastases is associated with 50% reduction in 5 year survival.[9] Goals of imaging are directed towards early recognition of the cause of cervical lymphadenopathy and precise decision making regarding treatment. Various imaging modalities like ultrasound, CT and MRI arc used. Ultrasonography is the most sensitive diagnostic method for detection or metastatic lymph nodes. It is noninvasive, rapidly available and cheaper than other methods. It helps in defining the morphologic as well as vascular invasion/ characteristics of lymphadenopathies.

Vascular architecture and hemodynamics both are different in different cervical nodal diseases. The morphology of blood vessels is deranged in metastatic lymph node diseases because of neoplastic infiltration. Various humoral agents cause intra nodal vascular dilatation, these changes in vascular patterns actually help in identification of differences between benign and malignant lymph nodes. The reported sensitivity, specificity and accuracy of Dopplerultrasound are 92.48%, 94.28%, 92.85% respectively while agreement between Doppler ultrasound and FNAC for diagnosis of cervical lymphadenopathy is 93.7%[10].

The rationale of this study is to explain the significance of Doppler ultrasonography in differential diagnosis of cervical lymphadenopathy which can minimize the need for invasive procedure FNAC. Doppler ultrasound helps in early detection of non-

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invasiveness and thus the cause of cervical lymphadenopathy along with staging of cancers[11].

PATIENTS AND METHODS

This study is designed as Cross sectional study which was conducted at Sheikh Zayed Hospital, Lahore in two departments in collaboration including radiologyand pathology during a period of six months starting from 8th October 2010 to 8th April 2011. Sample size is calculated as 75 cases, calculated with 95% confidence interval,margin of error was 5.5%, the percentage of agreement between Doppler ultrasound and FNAC expected as 93.7%for diagnosis of cervical lymphadenopathy. The technique used for sampling is purposive, Non-probability. Patients of both genders of all age groups who presented with palpable cervical lymph nodes (referred from medical and surgical OPD) were included in the study. Patient with raised INR (international normalization ratio) i.e., INR more than 1.5 and with low platelet count (<100,000) were excluded from the study.

Data collection procedure: Patients fulfilling the inclusion criteria were enrolled in the study from medical and surgical OPD of SZH, LHR. Informed consent was taken. AII information was collected on performa. Ultrasound for neck lymph nodes was done by using GE Volsun 730 Expert with a linear transducer of 7MHz by a senior radiologist, Then FNAC (Histopathology) of same lymph nodes were carried out by a single histopathology for confirmation of positive or negative case in collaboration with pathology department of SZH, LHR.

Data analysis procedure: Collected data was entered and analyzed using statistical software version 16 for windows. Quantitative variable was age and calculated as Mean + S.D. Qualitative variables were gender and calculated as frequency and percentage. Agreement between Doppler ultrasonography and FNAC in diagnosis of cervical lymph nodes was calculated as frequency and percentage.

RESULTS

A total of 75 cases selected as per inclusion and exclusion criteria were enrolled to determine the frequency of patients who show agreement between Doppler ultrasound and FNAC for diagnosis of cervical lymphadenopathy. The distribution of ages shows that majority of the patients was between 31-40 years 22(29.33%) while 17(22.67%) between 20-30 years, 16(21.33%) between 41-50 years, 11(14.67%) between 51-60 years and only 9(12%) were between 61-70 years, mean and sd was calculated as 34.51±3.62 years (Table 1). Gender distribution of the cases show 42(56%) male and 33(44%) were females (Table 2). Frequency of agreement between Doppler ultrasound and FNAC for diagnosis of cervical lymphadenopathy reveals 66(88%) while 9(12%) had no agreement (Table 3).

Table 1: Age distribution of the patients presented with cervical lymphadenopathy (n=75)

Age (years)	n
20-30	17(22.67%)
31-40	22(29.33%)
41-50	21.33%)
51-60	11(14.67)
61-70	9(12%)
Total	75(100%)
Mean±SD	34.51+3.62

Table 2: Gender distribution of the patients presented with cervical lymphadenopathy (n=75)

Gender	n
Male	42(56%)
Female	33(44%)
Total	75(100%)

Table 3: Frequency of agreement between doppler ultrasound and fnac for diagnosis of cervical lymphadenopathy (n=75)

Agreement	n
Yes	66(88%)
No	9(12%)
Total	75(100%)

DISCUSSION

Lymphatic system of body is widely distributed and Lymph nodes are the easily accessible part of lymphoid system. They are an important part of physical examination and palpable lymph nodes guide towards diagnosis of many diseases including lymph proliferative disorders. Palpable lymph nodes do not always indicate disease but it reflects frequent exposure to new antigens. It is important to assess nodal status in many malignant conditions including head and neck carcinoma where it predicts prognostic value as well. Doppler ultrasound has its own significance in detecting cervical lymphadenopathy and FNAC provides tissue diagnosis. Doppler ultrasound neck and FNAC collectively help in diagnosis and management of many diseases including malignancies.

Doppler ultrasound neck is sensitive as compared to clinical examination alone (96.8% and 73.3% respectively) especially in patients treated for head and neck cancers and developed post-radiation fibrosis[12]. When combined with guided fine needle aspiration cytology (FNAC), the specificity ofDoppler ultrasound also gets as high as 93%[13].

This study was actually planned to emphasize upon the usefulness of Doppler ultrasonography in making differential diagnosis for cervical lymphadenopathyand thus minimize the need for FNAC which is an invasive procedure. Doppler ultrasound helps in differentiating malignant fromnon-malignant condition, in staging of malignant diseases and successful management of patient.The results of our study revealedthat majority of the patients were between 31-40 years i.e., 22(29.33%), mean and SD was calculated as 34.51±3.62 years, 42(56%) male and 33(44%) were females, frequency of agreement between Doppler ultrasound and FNAC for diagnosis of cervical lymphadenopathy was 66(88%) while 9(12%) had no agreement.

The findings of the our study are compared with a study conducted by Dangore SB and colleagues,[14] who reported sensitivity, specificity and accuracy of Doppler ultrasound were 92.48%, 94.28% and 92.85% respectively. The agreement between Doppler ultrasound and FNAC for diagnosis of cervical lymphadenopathy in this study was 93.7%.

Another study conducted by Gupta A and co-authors[15] worked upon the role of high frequency ultrasound and color Doppler imaging in the diagnosis of patients with cervical lymphadenopathy. They reported that the sonographic findings had high accuracy in differentiating benign from malignant cervical lymph nodes. They therefore suggested that ultrasound scan could be used as the first-line imaging technique to determine the cause of lymphadenopathy and differentiating malignant from benign conditions. Its advantages included its ease, noninvasiveness, reproducibility, and cost effectiveness. It also guide for aspirations. Sadaksharam Jayachandran and colleagues[16] assessed the diagnostic accuracy of color doppler ultrasonography (CDUS) in oral cancer patients to differentiating metastatic from reactive lymph adenopathy, staging of cancer, determination of treatment planand prognosis.15However, the findings of the study in comparison with other studies reveal that Doppler ultrasonography is useful in differential diagnosis of cervical lymphadenopathy to minimize the need for FNAC. It also proves that early non-invasive detection of the cause of cervical lymphadenopathy is possible which can help in staging of disease and successful management of patient.

CONCLUSION

We concluded higher frequency of agreement between Doppler ultrasound and FNAC for the diagnosis of cervical lymphadenopathy.

REFERENCES

1. Seethala RR. CurrentState or Neck Dissection in the United States. Head neck pathol 2009;3:238-45.
2. Parisi E, Glick M. Cervical lymphadenopathy in dental patient: a review of clinical approach. Quintessence Int 2005;36:423-36.
3. Yaris N, Cakir M, sozen E. Analysis of Children with Peripheral Lymphadenopathy. ClinPediatr 2006;45:544-49.
4. Memon JM, Talpur AA. An audit peripheral lympadenopathy. Pak J Surg 2007;23:183-86.
5. Zahir ST, Azimi A. Histopathologic findings of lymph node biopsy cases in comparison with clinical features. Pak J Med Sci 2009;25:728-33.
6. Ying M, Ahuja AT. Ultrasound of neck lymph nodes how to do it and how do they look? Radiography 2006;12:105-17.
7. Ahuja AT, Ying M. Sonographic Evaluation or Cervical Lymph Nodes. Am J Roentgenol 2005;184:1691-99.
8. Choi EC, Moon WJ. Lim YC. Tuberculous cervical lymphadenitis mimicking metastatic lymph nodes from papillary thyroid carcinoma. Br J Radiol 2009;82:208-11.
9. Joseph KTL, Stuart S.S. Neck In: Computed body Tomography with MRI Correlation.4th ed. Philadelphia: Lippincott WilIiams& Wilkins;2006:p.196.
10. Dangore SB, Degwekar SS, Bhowate RR. Evaluation of the efficacy of colour Doppler ultasound in diagnosis cervical lymphadenopathy. DetomaxillofacRadiol 2008;37:205-12.
11. Ishii JI, Amagasa T, Tachibana T, Shinozuka K, Shioda S. US and CT evaluation of cervical lymph node metastasis from oral cancer. J Cranio-Max-Fac Surg. 1991;19:123.
12. Vassallo P, Edel G, Roos N, Naguib A, Peters PE. In-vitro high-resolution ultrasonography of benign and malignant lymph nodes. A sonographic-pathologic correlation. Invest Radiol. 1993;28:698
13. Bruneton JN, Normand F. Cervical lymph nodes. In: Bruneton JN, editor. Ultrasonography of the neck. Berlin: Springer-Verlag. 1987;p. 81
14. Baatenburg de Jong RJ, Rongen RJ, Lameris JS, Harthoorn M, Verwoerd CD, Knegt P. Metastatic neck disease. Palpation vs ultrasound examination. Arch Otolaryngol Head Neck Surg. 1989;115:689.
15. Gupta A, Rahman K, Shahid M, Kumar A, Qaseem SM, Hassan SA, Siddiqui FA. Sonographic assessment of cervical lymphadenopathy: role of high-resolution and color Doppler imaging. Head Neck. 2011;33(3):297-302.
16. Jayachandran S, Sachdeva SK. Diagnostic accuracy of color doppler ultrasonography in evaluation of cervical lymph nodes in oral cancer patients. Ind J Dent Res 2012;23:557-8.