

## Original Article

# Utility of Fine Needle Aspiration Cytology on Evaluation of Lymphadenopathy

Rojalin Nanda<sup>1</sup>, Gitimadhuri Dutta<sup>2</sup>, Radha Mohan Ghare<sup>3</sup>, Jyotirmayee Mishra<sup>2</sup>

Fine Needle Aspiration Cytology (FNAC) is one of the first line investigations advised in a patient with Peripheral Lymphadenopathy. The aim of this study is to determine the diagnostic utility of FNAC in a case with lymphadenopathy and the spectrum of cytological diagnoses associated with Lymphadenopathy. This is a one year retrospective study conducted in the Department of Pathology of VIMSAR, Burla. Patients presenting with Peripheral Lymphadenopathy referred to our cytology department for FNAC were included in our study. Previous records were studied and the corresponding stained smears of the aspirations were retrospectively examined and were categorized according to their diagnoses. Available histologic sections of these cases were correlated. Out of 448 FNAC done on cases of lymphadenopathy, 149(34.81%) were reactive hyperplasia of lymph node, 105(23.44%) were Granulomatous Lymphadenitis, 46(10.27%) were Suppurative Lymphadenitis, 5(1.11%) were Hodgkin's Lymphoma, 46(10.27%) were non-Hodgkin's Lymphoma, 97(21.65%) showed metastatic deposits. 292 cases were histologically correlated. The overall diagnostic accuracy was 88.36%. FNAC serves well in diagnosing the cause of Lymphadenopathy. It has been found to be highly beneficial in cases of Tuberculosis and Metastasis where further radiological and invasive procedures can be avoided.

[J Indian Med Assoc 2023; 121(9): 39-43]

**Key words :** Lymphadenopathy, Fine Needle Aspiration Cytology (FNAC), Reactive Lymphadenitis, Metastases, Lymphoma.

Lymphadenopathy is one of the commonest presentations in the outpatient department with the causes ranging from a reactive process to a malignancy. Fine Needle Aspiration Cytology (FNAC) can be called the choicest investigation to determine the cause behind it having given the fact that it is cheap, simple, easy, less invasive or less traumatic and above all early availability<sup>1</sup>.

In a developing country like ours where the cost-benefit ratio is highly taken into account, FNAC has a greater advantage of being cost effective in comparison to other surgical and radiological procedures. It almost always gives an accurate diagnosis for Reactive Hyperplasia, Granulomatous Lymphadenitis, Lymphoma and Metastatic Malignancy thus avoiding the need for excisional biopsy in most cases. This also aids the clinician in starting specific therapy without further investigations<sup>2</sup>.

A cytological diagnosis of Granulomatous Lymphadenitis directs the clinician to search for any of the several conditions like mycotic, viral and bacterial

### Editor's Comment :

■ FNAC is an effective and accurate procedure for diagnosing benign tumors including infections as well as high grade malignancies. However, its utility in diagnosing low grade lymphomas still remain doubtful and needs further research.

infections like Tuberculosis, Leprosy, Syphilis, Sarcoidosis, Toxoplasmosis or any carcinomas or lymphomas<sup>3</sup>. ZN staining of aspirations can give a definite diagnosis of Tuberculosis or Leprosy<sup>4</sup>.

More than 90% of the Metastases in the lymph node are diagnosed initially by FNAC<sup>5</sup>. The diagnosis of metastatic tumor to the lymph node on cytological smear is highly crucial especially in cases of occult carcinoma<sup>6</sup>. However, in cases where the primary tumor is clinically known, FNAC is used for making out the treatment plan and follow up of these patients. Most of metastatic malignancies can be identified by their typical cytomorphological characteristics. However, in instances where precise diagnosis of the primary tumor becomes difficult, ancillary techniques such as immuno-cytochemistry must be used to support the cytodiagnostic interpretation<sup>7,8</sup>.

### MATERIALS AND METHODS

The present study is a retrospective one conducted in the Cytology section of Postgraduate Department of Pathology, VIMSAR, Burla, Odisha over a period of 1 year (2021).

Department of Pathology, Veer Surendra Sai Institute of Medical Sciences and Research, Odisha 768017

<sup>1</sup>MBBS, Senior Resident and Corresponding Author

<sup>2</sup>MBBS, MD, Associate Professor

<sup>3</sup>MBBS, MD, Assistant Professor

Received on : 19/07/2022

Accepted on : 21/01/2023

The cytology record of the year 2021 was reviewed and the cases with a presentation of Peripheral Lymphadenopathy were noted. The corresponding Diff-Quik and Papanicolaou stained smears of aspirations were re-examined. Ziehl-Neelsen Staining smears wherever available were also reviewed (Table 1).

The Hematoxylin & Eosin (H&E) stained sections wherever available were correlated with their corresponding cytologic smears.

### RESULTS

Out of the 428 cases with Peripheral Lymphadenopathy, 241 cases were males while 187 were females. The age ranged from 2 years to 84 years. 273 patients had single enlarged lymph node and the rest 155 had multiple to generalized Lymphadenopathy.

All the cases with Lymphadenopathy were cytologically divided into 7 categories (Table 2).

The patients with reactive hyperplasia of lymph node ranged from 2 years to 75 years of age, with a mean of 26.29 years. Out of the 122 cases, 64 were male while 58 were female. In 59 of the patients presented with cervical Lymphadenopathy and 13 had multiple palpable lymph nodes. Five cases with axillary lymph nodes with cytological characteristics of reactive hyperplasia had concomitant breast lumps diagnosed as ductal carcinoma.

Granulomatous Lymphadenitis was found in patients from 7 years to 75 years with a mean age of 32.52 years. 62 were male and 43 were female. Seventy of these patients had cervical lymph nodes with 26 of them having multiple matted lymph nodes.

Suppurative Lymphadenitis was seen in 26 cases out of which 17 were male and 9 were female. The patients age ranged from 4 years to 65 years. The mean age was calculated to be 35.35 years.

HL was comparatively seen in very few (5 cases). The youngest patient was 8 years old male while the

oldest was 40 years old male. NHL was diagnosed in 46 cases out of which 34 were male and 12 were female. The age of the patients ranged from 16 years to 78 years with a mean of 45.6 years. 23 patients had generalized Lymphadenopathy with cervical, axillary and inguinal lymph nodes. 10 patients had radiologic reports showing mediastinal and retroperitoneal lymph nodes.

Metastatic deposits were seen in 97 cases, where the youngest patient was 18 years. 33 cases with axillary lymph nodes had underlying carcinoma of the breast. 13 cases with supra-clavicular lymph node had radiologically visible lung masses. Other cases with known primary were angiosarcoma (1), squamous cell carcinoma in the oral cavity (9), Squamous cell carcinoma of the penis (1), melanoma in the lower limb (1), carcinoma cervix (1) and seminoma (1). Rest 37 cases had unknown primary.

Non-specific Lymphadenitis was given as a diagnosis in 27 cases where the cytological picture was not attributable to any of the other headings.

The corresponding slides and reports of available 292 histology sections were reviewed. The 292 samples for histopathology were cytologically reported as: 68 cases as Reactive hyperplasia, 66 cases as Granulomatous Lymphadenitis, 5 cases as Suppurative Lymphadenitis, 5 cases as HL, 37 cases as NHL, 90 cases as metastatic deposits and 21 cases as Non-specific lymphadenitis.

With a diagnostic accuracy of 97.05%; 66 cases were confirmed to be Reactive Follicular Hyperplasia, and 2 cases were NHL (Follicular Lymphoma).

Of the 66 cytological Granulomatous Lymphadenitis cases, 63 were histologically confirmed to be Granulomatous lymphadenitis (95.45% accuracy), with 32 of them proved to be tuberculous in origin by means of culture. 1 case was Hodgkin's lymphoma- mixed cellularity type and 2 cases had foreign cells (Metastases).

Two of the 5 suppurative lymph nodes were histologically granulomatous and culture confirmed to be Tuberculosis. FNAC was found 100% accurate in HL cases. 4/5 were histologically nodular sclerosis and 1 was mixed cellularity.

Of the 37 cytological NHL cases, histological examinations of the sections confirmed 31 (diagnostic accuracy 83.78%). 15 cases were Diffuse Large B-Cell Lymphoma (DLBCL), 8 Small Lymphocytic Lymphoma (SLL), 4 Follicular Lymphoma, 3 Anaplastic Lymphoma, and 1 Burkitt's Lymphoma. 6 cases turned out to be Reactive Follicular Hyperplasia.

All the 90 cases (100%) with a cytological diagnosis

Table 1 — Distribution of lymph nodes in different regions

Site	Number
Cervical	231
Axillary	90
Supra-clavicular	62
Sub-mandibular	49
Inguinal	36
Sub-mental	10

Table 2 — FNAC diagnostic categories and their distribution

	Reactive hyperplasia	Granulomatous	Suppurative	HL	NHL	Metastatic
Max Age	75	75	65	40	78	84
Min Age	2	7	4	8	16	18
Mean	26.29	32.52	35.35	22.4	45.59	52.72
Median	24.5	28	36.5	23	45	55
Mode	30	28	15	-	45	60
Male	87	62	17	2	34	39
Female	62	43	9	3	12	58
Total	149	105	26	5	46	97

of metastatic deposits were histologically confirmed. Sections of 28 lymph nodes with unknown primary were diagnosed as 13 Adenocarcinoma and 15 Squamous cell carcinoma.

The sensitivity of FNAC in suppurative Lymphadenitis is 100% while the specificity is 99.31%. The specificity for both HL and metastases into lymph nodes are 100% specific (Table 3).

### DISCUSSION

FNAC can provide an accurate diagnosis in reactive Lymphoid hyperplasia, Suppurative conditions, granulomatous lymphadenitis, and metastatic tumor deposits, thus aiding in the initiation of rapid treatment without the need for an excisional biopsy<sup>7</sup>. When correlated with clinical and radiological findings, FNAC can be a diagnostic method that can prevent unnecessary procedures. It can also distinguish between benign and malignant lesions with significant accuracy<sup>8</sup>. Although FNA is a simple, fast and inexpensive method to diagnose lymph node lesions and is increasingly used in routine practice, histopathological evaluation of the organ (or lymph nodes as in this study) is still considered to be the gold standard for the final diagnosis<sup>9,10</sup>.

In this study cervical lymph nodes constituted majority (53.97%) of the sites of Lymphadenopathy. Haque and Talukder similarly found 102/117 cases (87.18%) had cervical Lymphadenopathy<sup>11</sup>. Reddy, *et al* too had a similar report. They found that cervical group of lymph nodes were the ones most commonly involved (82% of cases). They also reported that granulomatous Lymphadenitis was most common in young adults and reactive nonspecific lesions were most common in paediatric group and metastatic carcinomas were most common type after 5<sup>th</sup> decade which is similar to our study<sup>12</sup>. Ali, *et al* similarly found cervical Lymphadenopathy in 69.01% cases and Nesreen, *et al* in 37.6% of their total cases<sup>13,14</sup>.

Badge, *et al* conducted a study for 2 years and found 310 cases with lymphadenopathy. They found tubercular Lymphadenitis in 151 (48.70%) cases, granulomatous Lymphadenopathy in 102 (32.90%) cases, reactive Hyperplasia in 25 (8.06%) cases, Metastatic carcinoma in 12 (3.87%) cases, Suppurative Granulomatous in 7 (2.25%) cases, acute suppurative Lymphadenitis in 5 (1.61%) cases, non-Hodgkin's Lymphoma in 2 (0.64%) cases, and Hodgkin's Lymphoma in 1 (0.32%) case<sup>15</sup>.

In 168 cases of Lymphadenopathy were studied by Dharwadkar, *et al* out of which 63 cases (33.69%) were reactive hyperplasia, 54 cases (28.88%) were tubercular Lymphadenitis and 33 (17.65%) cases were

Table 3 — Sensitivity and specificity of FNAC

Category	Diagnostic Accuracy	Sensitivity (In %)	Specificity (In %)
Reactive	97.05%	91.67	99.09
Granulomatous	95.45%	96.92	98.68
Suppurative	-	100	99.31
HL	100%	83.33	100
NHL	83.78%	93.94	97.69
Metastases	100%	97.83	100

metastatic malignancy, 12 cases (6.42%) were acute suppurative Lymphadenitis and 4 cases (2.14%) were non-Hodgkin's Lymphoma (NHL)<sup>4</sup>.

In this study, metastasis in the lymph nodes constituted 22.66% of the total cases which is similar to studies conducted by Kochar, *et al*; Ali, *et al* and Sharma, *et al*<sup>16,13,17</sup>. While Mitra, *et al*, Bhaskaran, *et al*; Khajuria, *et al*; Srivastav, *et al*; Hirachand, *et al*; and Bhavani, *et al* in their separate studies found that the incidence of metastatic lesions were 13.7%, 5.6%, 3.8%, 11.84%, 12.3% and 11.32% respectively which are lower than the present study<sup>18-23</sup>.

In a 10 years study by Ali, *et al* 39.22% cases were reactive, 33.52% tubercular, 24.60% metastatic lymph nodes and 2.60% cases were hematological malignancies. They found that cervical lymph nodes were the commonest site for metastasis (69.01% cases)<sup>13</sup>.

Contrary to all the above studies, Zhou, *et al* found that malignancy constituted majority of lymph node cytology cases which was 53.6% while the others like chronic non-specific Lymphadenitis constituted 15.2%; reactive lymph node 7.5%; pyogenic abscess 2.9%; tuberculosis Lymphadenitis 8.7%; Hodgkin lymphoma, 4.8%; and non-Hodgkin lymphoma, 7.16%<sup>24</sup>.

Sharma, *et al* in their study of 1026 lymph node aspirates, identified 188 cases (18%) as malignancies in lymph nodes. There were 145 males (77%) and 43 females (23%) and the male to female ratio was 3.5:1. Cervical lymph node (140/188; 74%) was the main group of lymph node involved. They found that 158 cases (84%) had metastasis to lymph nodes while 30 cases (16%) had primary lymphomas. They identified Squamous cell carcinoma in 96/158 (60%) cases. 51/158 (32%) cases had primary in the lungs and 12% cases had unknown primary<sup>17</sup>.

In this study the overall diagnostic accuracy is 88.36% (258 out of 292 cases). Bhaskaran, *et al* and Giri, *et al*<sup>19,25</sup> reported similar correlation rates of 88% and 87% respectively. Al-Mulhim, *et al*; Sumyra, *et al* and Anuradha, *et al* reported a higher overall accuracy of Fine Needle Aspiration at 93%, 93% and 94% respectively<sup>26-28</sup>. Adhikari, *et al* reported a slightly

similar correlation rate of 91% (50/55 cases)<sup>29</sup>. Nesreen, *et al* reported the lowest correlation rates at 82%<sup>14</sup>.

In the present study FNAC for reactive hyperplasia correlated well (97.06%) with the Histopathological Examination (HPE). The diagnostic accuracy in both the studies by Adhikari, *et al* and Al-Mulhim, *et al* was found to be 100%. While Nasar, *et al*<sup>30</sup>. Nesreen, *et al*<sup>14</sup> and Sumyra, *et al*<sup>27</sup> reported an accuracy of 89%, 58% and 76.78% respectively. Giri, *et al*<sup>25</sup> reported the lowest correlation rate at 33.33% due to their study on only 6 cases of reactive hyperplasia.

In this study FNAC for Granulomatous Lymphadenopathy has a correlation rate of 95.45% which is similar to that of Nasar, *et al* (95%)<sup>30</sup>, Giri, *et al* (94.11%)<sup>25</sup> and Al-Murham, *et al* (93%)<sup>26</sup>. Sumyra, *et al*<sup>27</sup>, Adhikari, *et al*<sup>29</sup> and Nesreen, *et al*<sup>14</sup> reported lower correlation rates of 91.11%, 87%, 70% respectively.

In this study accuracy of FNAC for suppurative lymphadenitis was only 60% as only 5 out of the total 26 cases were available for HPE. While Nasar, *et al*<sup>30</sup> reported a correlation rate of 86%, Patra, *et al*<sup>31</sup> reported 100%.

Al-Murham, *et al* reported a diagnostic accuracy of 90% in Hodgkin's lymphoma, 86% in non-Hodgkin's lymphoma, and 91% in metastasis lymphadenopathy<sup>26</sup>.

In the present study, sensitivity and specificity for metastatic lesions has been found to be 97.83% and 100% respectively. Gupta, *et al* reported similar sensitivity and specificity for metastatic as 98.5% and 100% respectively<sup>32</sup>. The sensitivity and specificity in our study for HL is 83.33%, 100% respectively and for NHL is 93.94%, and 97.69% respectively. Kim, *et al* reported that sensitivity of metastatic carcinoma was 98.0% and that of malignant lymphoma was 87.9%<sup>33</sup>.

Similar to our study (90/90), Wilkinson *et al* found 100% diagnostic accuracy with all 50 of the cytologically malignant cases which were histologically confirmed<sup>34</sup>.

### CONCLUSION

Fine Needle Aspiration Cytology (FNAC) has become one of the most beneficial diagnostic procedures that provide not only a provisional diagnosis but also gives an idea of treatment approach of the lesion. It is also conclusive in lesions of infectious or metastatic origin.

### REFERENCES

- Keith VE, Harsharan SK and Jerald GZ — Fine needle aspiration biopsy of lymph nodes in the modern era: Reactive lymphadenopathies. *Pathol Case Rev* 2007; **12**: 27-35.
- Howlett DC, Harper B, Quante M, Berresford A, Morley M, Grant J — Diagnostic adequacy and accuracy of fine needle aspiration cytology in neck lump assessment: results from a regional cancer network over a one year period. *J Laryngol Otol* 2007; **121**(6): 571-9.
- Metre MS, Jayaram G — Acid-fast bacilli in aspiration smears from tuberculous lymph nodes. An analysis of 255 cases. *Acta Cytol* 1987; **31**(1): 17-9. [PubMed]
- Vimal S, Dharwadkar A, Chandanwale S, Vishwanathan V, Kumar H — Cytomorphological study of lymph node lesions: A study of 187 cases. *Med J Dr DY Patil Univ* 2016; **9**: 43.
- Patel MM, Italiya SL, Dhandha ZB, Dudhat RB, Kaptan KR, Shah MB, *et al* — Study of metastasis in lymph node by fine needle aspiration cytology: our institutional experience. *Int J Res Med Sci* 2013; **1**: 451-4.
- Kollar SM, Hag IBE — Fine needle aspiration cytology of metastatic nasopharyngeal carcinoma in cervical lymph nodes: comparison with metastatic squamous cell carcinoma and Hodgkin' and Non Hodgkin' lymphoma *Diagn Cytopathol* 2003; **28**: 18-22. Scopus Google Scholar
- Howlett DC, Harper B, Quante M, Berresford A, Morley M, Grant J, *et al* — Diagnostic adequacy and accuracy of fine-needle aspiration cytology in neck lump assessment: results from a regional cancer network over a one year period. *J Laryngol Otol* 2007; **121**: 571-9.
- Paker IO, Kulaçođlu S, Eruyar T, Ergül G — Fine needle aspiration cytology of head and neck masses: a cytohistopathological correlation study with emphasis on false positives and false negatives. *Kulak Burun Bogazlhtis Derg* 2013; **23**: 163-72. [CrossRef ]
- Moatamed NA, Naini BV, Fathizadeh P, Estrella J, Apple SK — A correlation study of diagnostic fine-needle aspiration with histologic diagnosis in cystic neck lesions. *Diagn Cytopathol* 2009; **37**: 720-6.
- Saatian M, Badie BM, Shahriari S, Fattahi F, Rasoolinejad M — FNA diagnostic value in patients with neck masses in two teaching hospitals in Iran. *Acta Med Iran* 2011; **49**: 85-8.
- Haque MA, Talukder SI — Evaluation of fine needle aspiration cytology of lymph node in Mymensingh. *Mymensingh Med J* 2003; **12**(1): 33-5. Scopus Google Scholar
- Reddy S, Vinay Kumar R, Kushtagi A V, Reddey H, Husain K W, Morphological patterns of FNAC of lymph nodes. *Indian J Pathol Oncol* 2018; **5**(2): 269-72.
- Ali MB, Kaushik A, Rizvi G — Morphological spectrum of enlarged peripheral lymph nodes on Fine Needle Aspiration Cytology: A study of 16,985 cases from tertiary care center in Uttarakhand. *JMSCR* 2020; **8**(1):
- Nesreen H. Hafez, Neveen S — Tahoun, Reliability of fine needle aspiration cytology (FNAC) as a diagnostic tool in cases of cervical lymphadenopathy. *Journal of the Egyptian National Cancer Institute* 2011; **23**(2): 105-14. ISSN 1110-0362, <https://doi.org/10.1016/j.jnci.2011.09.009>.
- Badge SA, Ovhal AG, Azad K, Meshram AT — Study of fine-needle aspiration cytology of lymph node in rural area of Bastar District, Chattisgarh. *Med J DY Patil Univ* 2017; **10**: 143-8.
- Kochar AK, Duggal G, Singh K, Kochar SK — Spectrum of

- Cytological Findings In Patients with Lymphadenopathy In Rural Population of Southern Haryana, India - Experience in a Tertiary Care Hospital. *Internet J Pathol* 2012; **13(2)**.
- 17 Manupriya S, Aruna G, Kaul R — Utility of FNAC in Diagnosis of Lymph Node Malignancies: An Audit from a Rural Medical College. *Int J Cancer Cell Biol Res* 2017; **2(2)**: 34-8.
- 18 Mitra S, Ray S, Mitra PK — Analysis of FNAC of cervical lymph nodes: experience over a three-year period. *J Indian Med Assoc* 2013; **111(9)**: 599-602. PMID: 24968522.
- 19 Bhaskaran CS, Kumar HG, Sreenivas M, Kamleshwari R, Rao G, Aruna CA — Fine needle aspiration cytology. Review of 1731 cases. *Indian J Pathol Microbiol* 1990; **33(4)**: 387-97.
- 20 Khajuria R, Gosswami KC, Singh K, Dubey VK — Pattern of lymphadenopathy on fine needle aspiration cytology in Jammu. 2006; **8(3)**: 157-9.
- 21 Srivastav N, Shah HA, Agarwal NM, Santwani PM, Srivastava G — Evaluation of peripheral lymphadenopathy by fine needle aspiration cytology: A three year study at tertiary center. *J NTR Univ Health Sci* 2014; **3**: 86-91.
- 22 Hirachand S, Lakhey M, Akhter J, Thapa B — Evaluation of fine needle aspiration cytology of lymph nodes in Kathmandu Medical College, Teaching Hospital. *Kathmandu Univ Med J* 2009; **7**: 139-42.
- 23 Bhavani C, Neeraja M, Varalakshmi KP, Ramana Babu PV, Chaitanya B, Sravani P — Role of FNAC in the diagnosis of cervical lymphadenopathy. *Int J Med Res Rev* 2014; **2**: 599-603.
- 24 Zhou J, Li F, Meng L, Hao F, Liu X, Zhao C, *et al* — Fine needle aspiration cytology for lymph nodes: a three-year study. *Br J Biomed Sci* 2016; **73(1)**: 28-31. doi: 10.1080/09674845.2016.1144947. Epub 2016 Mar 16. PMID: 27182674.
- 25 Giri S, Singh K — Role of FNAC in evaluation of patients with superficial lymphadenopathy. *International Journal of Biological and Medical Research* 2012; **3(4)**: 2475-2479.
- 26 Al-Mulhim AS, Al-Ghamdi AM, Al-Marzooq HM, Mohammad HA, Gharib IA — The role of fine needle aspiration cytology and imprint cytology in cervical lymphadenopathy. *Saudi Med J* 2004; **25**: 862-5. Scopus Google Scholar
- 27 Qadri SK, Nissar H, Praveen S, Iqbal Lone, Khalil B — Profile of Lymphadenopathy in Kashmir Valley: a cytological study. *Asian Pacific J Cancer Prev* 2012; **13**: 3621-5.
- 28 Anuradha S, Parthasarathy V — Usefulness of imprint and FNAC, in diagnosis of lymphadenopathies and other tumours. *Indian Journal of Pathol, Micro* 1989; **32**: 291-6.
- 29 Adhikari P, Sinha BK, Baskota DK — Comparison of fine needle aspiration cytology and histopathology in diagnosing cervical lymphadenopathies. *Australasian Medical Journal* 2011; **4(2)**: 97-9.
- 30 Nasar MA, Salma M, Kouser T — Cytological and histopathological correlation of lymph node swellings. *Indian Journal of Pathology and Oncology*; **3(2)**: 427-31/ 2394-6792
- 31 Patra AK, Nanda BK, Mahapatra Pandu AK, Nanda BK, Mahapatra, Pandu AK — Diagnosis of lymph adenopathy by fine needle aspiration cytology. *Ind Jour of Path Micro* 1983; **26**: 273-8.
- 32 Gupta ML, Singh K — Correlation of fine needle aspiration cytology lymph node with histopathological diagnosis. *International Journal of Research in Medical Sciences* 2016; **4(11)**: 4719-23, dec. 2016. ISSN 2320-6012.
- 33 Kim HS, Kim DS, Oh YL, Ko YH, Ree HJ — Diagnostic Usefulness and Limitation of Fine Needle Aspiration Cytology of Lymph Node: Analysis of 176 Cases Confirmed by Biopsy. *J Pathol Transl Med* 1999; **10(1)**: 35-42.
- 34 Wilkinson AR, Mahore SD, Maimoon SA — FNAC in the diagnosis of lymph node malignancies: A simple and sensitive tool. *Indian J Med Paediatr Oncol* 2012; **33(1)**: 21-4. doi:10.4103/0971-5851.96964.

## Disclaimer

The information and opinions presented in the Journal reflect the views of the authors and not of the Journal or its Editorial Board or the Publisher. Publication does not constitute endorsement by the journal.

JIMA assumes no responsibility for the authenticity or reliability of any product, equipment, gadget or any claim by medical establishments/institutions/manufacturers or any training programme in the form of advertisements appearing in JIMA and also does not endorse or give any guarantee to such products or training programme or promote any such thing or claims made so after.

— Hony Editor