Original Article

Spectrum of Patterns in Lymph Node Histopathology at A Tertiary Healthcare Centre in Hadoti Region

Vandana Pathak[1], Bhawika Menghani[1]*, Lubhanshi Dhakar[2], Bhoomika Sharma[2]

[1]Department of Pathology, Government Medical College, Kota, Rajasthan, India
[2]MBBS Student, Government Medical College, Kota, Rajasthan, India

DOI: 10.21276/APALM.3319

***Corresponding Author**:
Dr. Bhawika Menghani
menghanibhawika@gmail.com

Submitted: 06-Mar-2024
Final Revision: 03-Apr-2024
Acceptance: 19-Apr-2024
Publication: 07-May-2024

Abstract

Background

Lymph nodes are an integral part of immune system and, being the most widely distributed and easily accessible lymphoid tissue so they are frequently examined for diagnostic purposes. It is necessary to document the spectrum in a particular region to understand the trend and diseases occurring frequently in that region. The aim of this study is to evaluate spectrum of histopathological diagnosis among multiple etiologies of lymphadenopathy.

Methods

This is a retrospective descriptive study undertaken in the Department of Pathology, Government Medical College, Kota of all the lymph node biopsies received in our department over a period of one year from January 2023 to December 2023.

Result

A total of 102 patients were included, out of which females are 60 (59%) cases and males constituted 42 (41%) cases. Most common affected age group was 21-40 years and site was cervical with 42 (41.17%) cases. 54 cases (52.94%) showed changes of reactive lymphadenitis. Hodgkin and non-Hodgkin lymphoma ratio in male to female was 3:1, while that of tubercular lymphadenitis was 3:10. Metastatic squamous cell carcinoma and infiltrating ductal carcinoma was seen contributing to 10 (40%) cases each.

Conclusion

It is evident that most common pattern in lymph node pathology is reactive lymphadenitis, affecting age group 21-40 years, majorly affecting females. Females are mostly involved in cases of tuberculosis with ratio being 3:10. In developing country such as India, this points to frequent population exposure to infections. This could indicate a need to strengthen primary and secondary levels of preventive measures.

Keywords:

Lymph node, Lymphadenopathy, Tuberculosis, Biopsy, Metastasis

Introduction

Lymph nodes are an integral part of immune system and being, the most widely distributed and easily accessible lymphoid tissue so they are frequently examined for diagnostic purposes. Infections and inflammatory stimuli often elicit regional or systemic immune reactions within lymph nodes [1]. They are also implicated in various instances of malignancies, such as lymphomas and

metastasis. Some produce distinct morphological changes, while others cause stereotypical alterations, which manifest clinically as abnormal increase in number, size, and consistency of lymph node designated as lymphadenopathy. It is necessary to document the spectrum in a particular region to understand the trend and diseases occurring frequently in that region so preventive measures and diagnostic measures can be taken accordingly [2].

The aim of this study is to evaluate histopathological diagnosis among multiple etiologies of lymphadenopathy and aid in early definitive diagnosis and clinical management at a tertiary healthcare center.

Materials and Methods

This is a retrospective descriptive study undertaken in the Department of Pathology, Government Medical College, Kota of all the lymph node biopsies received in our department over a period of one year from January 2023 to December 2023. A total of 102 cases were observed for histopathological evaluation. All the necessary data regarding age, sex and site of biopsy was collected from records register. The biopsy specimens were fixed in 10% neutral buffered formalin, followed by tissue processing. Tissue blocks were then prepared accordingly, followed by 4µ tissue sections. They were then subsequently stained with Hematoxylin & Eosin and mounted in dibutyl phthalate polystyrene xylene.

All the data collected was entered into a Microsoft Excel sheet and tables, charts and graphs were utilized to analyze data.

Results

A total of 102 patients with lymph node lesions were included. Majority of the patients were females 60 (59%) cases and males constituted 42 (41%) cases, see (Figure.1). Frequent cases were seen in age group 21-40 years with 36 (35.29%) cases, followed closely by age group 41-60 years with 35 (34.31%) cases, 0-20 years with 17 (16.66%) cases, >60 years with 14 (13.42%) cases, as evidenced by (Table1)

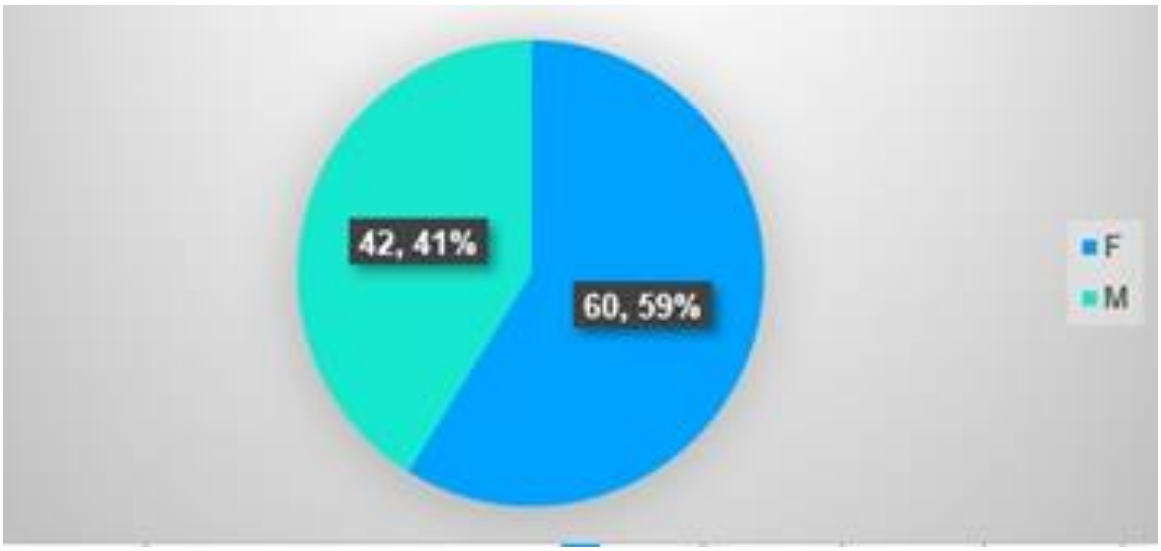

Figure 1: Sex wise distribution of cases

Table 1:Age wise and sex wise distribution of diseases

Biopsy Diagnosis	**Age Groups**							
	0-20 years		21-40 years		41-60 years		>60 years	
	M	F	M	F	M	F	M	F
Castleman Disease	0(0%)	0(0%)	0(0%)	1(3.84%)	0(0%)	1(4.76%)	0(0%)	0(0%)
Hodgkin Lymphoma	3(27.27%)	0(0%)	0(0%)	0(0%)	0(0%)	1(4.76%)	0(0%)	0(0%)
Metastasis	0(0%)	0(0%)	1(10%)	9(34.61%)	5(35.71%)	7(33.33%)	1(14.28%)	2(28.57%)
Non-Hodgkin Lymphoma	1(9.09%)	0(0%)	0(0%)	0(0%)	1(7.14%)	0(0%)	1(14.28%)	1(14.28%)
Reactive Follicular Hyperplasia	5(45.45%)	3(50%)	3(30%)	11(42.3%)	7(50%)	6(28.57%)	4(57.14%)	2(28.57%)
Sinus Histiocytosis	1(9.09%)	0(0%)	4(40%)	1(3.84%)	1(7.14%)	3(14.28%)	1(14.28%)	2(28.57%)
Tubercular Lymphadenitis	1(9.09%)	3(50%)	2(20%)	4(15.38%)	0(0%)	3(14.28%)	0(0%)	0(0%)
Total	11(100%)	6(100%)	10(100%)	26(100%)	14(100%)	21(100%)	7(100%)	7(100%)

Sites of lymph nodes most often involved were cervical with 42 (41.17%) cases, then mesenteric with 26 (25.49%) cases, axillary with 23 (22.55%) cases, iliac with 7 (6.86%) cases, and inguinal with 4 (3.92%) cases, represented by (Figure 2).

Of all the 102 histology slides examined, 54 (52.94%) showed morphological changes associated with non-specific reactive lymphadenitis such as follicular hyperplasia and sinus histiocytosis, 25 (24.5%) exhibited metastatic cells, 13 (12.74%) were cases of tubercular lymphadenitis, 4 (3.92%) each of Hodgkin and Non-Hodgkin lymphoma and least 2 (1.96%) being diagnostic of Castleman's Disease (Figure 3). Complete effacement of lymph node architecture was seen in cases of lymphomas along with diagnostic Reed-Sternberg cells and diffuse cellular infiltrate of eosinophils, T-cells, plasma cells and macrophages. Histopathological examination of tubercular lymphadenitis typically showed areas of caseous necrosis and presence of granuloma with epithelioid cells. Langhans' Giant cells were also observed.

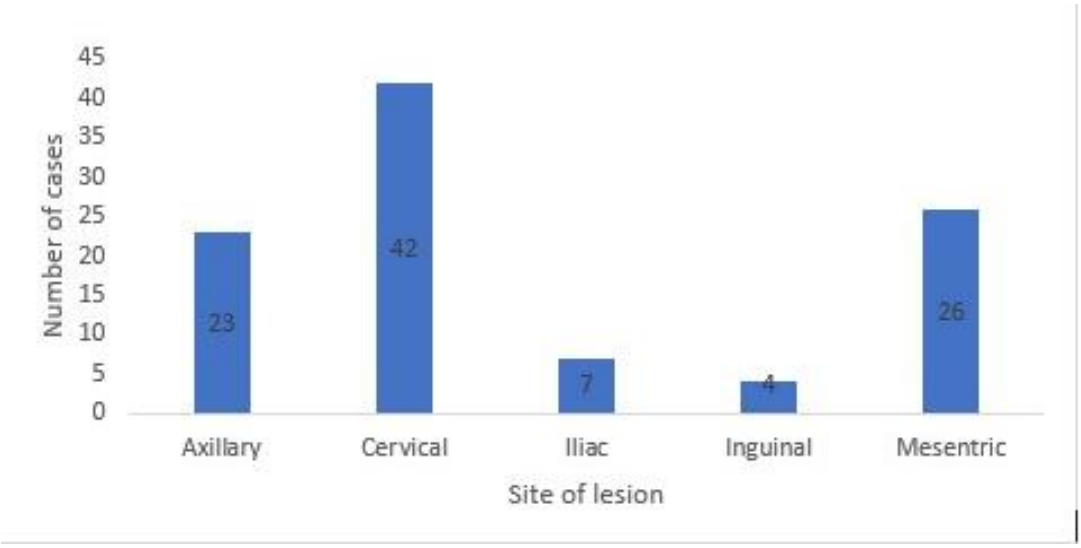

Figure 2: Site wise distribution of cases

Prevalent pathologies in females encountered were non-specific reactive lymphadenitis amounting to 22 (36.66%) cases, followed by 18 (30%) cases of metastasis, 10 (16.66%) cases of tubercular lymphadenitis and 2 (3.33%) cases of Castleman's Disease. Slightly similar pattern was observed in males with most cases 19 (45.24%) cases of non-specific reactive lymphadenitis, 7 (16.66%) cases of metastasis, and 3 (7.14%) cases each of tubercular lymphadenitis. (Table 1)

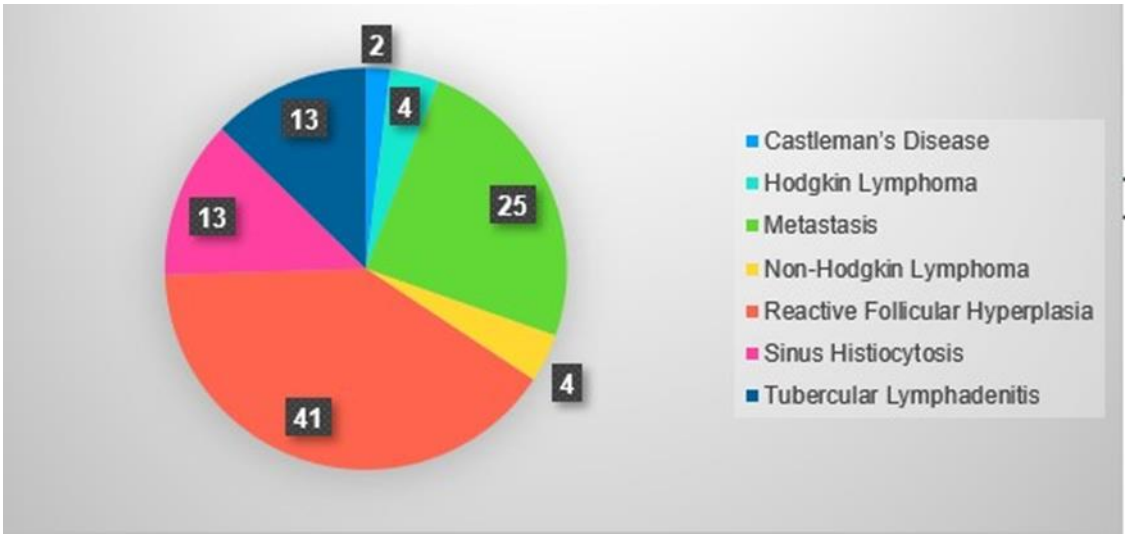

Figure 3: Lesion wise distribution of cases

Hodgkin and Non-Hodgkin Lymphoma ratio of incidences in male to female stood at 3:1, while that of tubercular lymphadenitis was 3:10.

As for the distribution of the diseases according to the site cervical, mesenteric, iliac, and inguinal lymph node excised commonly shows reactive follicular hyperplasia in 15 cases, 14 cases, 5 cases and 1 case respectively while axillary lymph node mostly shows involvement by metastasis in 12 cases. (Table 2)

Table 2: Diagnosis distribution according to site

Biopsy Diagnosis	**Site of Lesion**				
	Cervical	Axillary	Mesenteric	Iliac	Inguinal
Castleman Disease	1(2.38%)	0(0%)	0(0%)	0(0%)	1(25%)
Hodgkin Lymphoma	3(7.14%)	1(4.34%)	0(0%)	0(0%)	0(0%)
Metastasis	12(28.57%)	12(52.17%)	0(0%)	1(14.28%)	0(0%)
Non-Hodgkin Lymphoma	3(7.14%)	1(4.34%)	0(0%)	0(0%)	0(0%)
Reactive Follicular Hyperplasia	15(35.71%)	4(17.39%)	14(53.84%)	5(71.43%)	3(75%)
Sinus Histiocytosis	3(7.14%)	4(17.39%)	5(19.23%)	1(14.28%)	0(0%)
Tubercular Lymphadenitis	5(11.90%)	1(4.34%)	7(26.92%)	0(0%)	0(0%)
Total	42(100%)	23(100%)	26(100%)	7(100%)	4(100%)

Regarding the cases with metastasis, occurrence of metastatic squamous cell carcinoma and infiltrating ductal carcinoma was commonly seen contributing to 10 (40%) cases each followed by 3 (12%) cases of metastatic adenocarcinoma, showing tumor cells arranged in glandular pattern in lymph nodes. There was 1 (4%) case each of metastatic papillary carcinoma and metastatic

medullary carcinoma of thyroid. (Table 3)

Table 3: Biopsy diagnosis in cases of metastasis

Biopsy diagnosis	Number of cases
Squamous Cell Carcinoma	10 (40%)
Adenocarcinoma	3 (12%)
Infiltrating Ductal Carcinoma	10 (40%)
Medullary Carcinoma thyroid	1 (4 %)
Papillary Carcinoma thyroid	1 (4%)
Total	25 (100%)

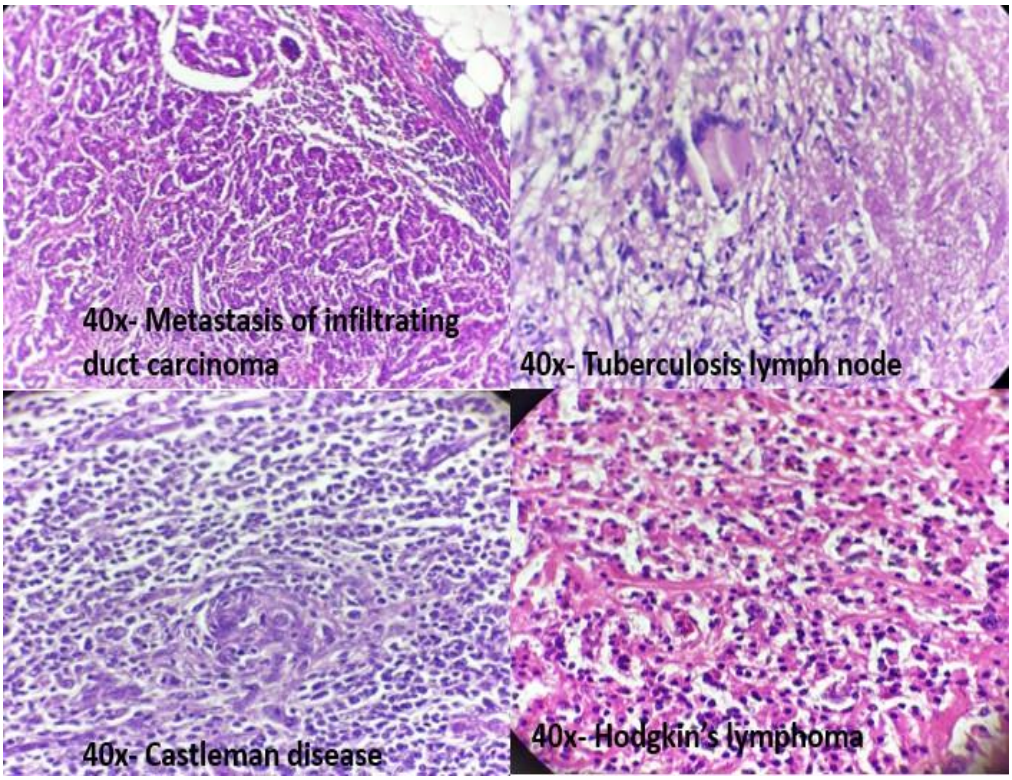

Figure 4: Various histological images of different cases

Discussion

In the present study, females were more frequently affected than males contributing to 60 (59%) cases. These findings are similar to the studies conducted by Pagaro PM et al, Shah B et al and Goyal S et al. [2,3,10] However, they stand in contrast of the studies done by Ashwini et al, Lali Krishnan Rajan et al, Pallavi SMS et al, Samina Ali et al and Dr. Shubhanghi V Agale et al where males accounted for majority of cases. [4,5,6,7,8]

Most commonly affected age group was 21-40 years with 36 (35.29%) cases which was similar to study done by Samina Ali et al and Dr. Shubhangi V Agale et al.[7,8] However, Pagaro PM et al, Ashwini et al. and Goyal S et al found out age group 41-50 years with most cases. [2,4,10]

In the present study, cervical lymph nodes were a frequent site for biopsy, followed by axillary group of lymph nodes. These findings are consistent with studies conducted by Shah B et al, Ashwini AS et al, Samina Ali et al, Dr. Shubhangi V Agale et al and Vidhyadhar R [3,4,7,8,12] The least frequent site to be involved was inguinal with 4 (3.92%) cases. Similar pattern was observed in studies conducted by Ashwini et al and Pallavi SMS et al. [4,6]

Among the non-neoplastic lesions of lymph nodes, reactive lymphadenitis was frequently encountered. This resembles the studies concluded by Ashwini et al, Damle R et al, Goyal S et al and Arun Roy et al. [4,9,10,13] However, some studies, such as those directed by Shah B et, Pallavi SMS et al, Dr. Shubhangi V Agale et al and Gupta N et al concluded that tuberculosis is the most common among non-neoplastic lesions. [3,6,8,11] As for the site involvement by the disease our study shows reactive follicular hyperplasia to be involving mostly the cervical, mesenteric, inguinal, and iliac lymph node while metastasis was found mostly in axillary lymph node which was similar to the study done by Ashwini et al [4] in case of cervical lymph node but it differs in case of axillary, mesenteric, inguinal and iliac lymph nodes.

This study also illustrates that among the neoplastic lesions, metastasis was the most common etiological factor. Out of all metastatic lymph nodes, most cases were metastatic squamous cell carcinoma and metastatic infiltrating ductal carcinoma followed by metastatic adenocarcinoma. This correlates closely with study done by Dr. Shubhangi V agale et al and Vachhani A et al. [8,14] However, this stands in slight contrast to studies by Ashwini et al and Damle R et al. [4,9] Damle R et al., found that of all metastatic lymph nodes, 34 (62.9%) cases were metastatic infiltrating ductal carcinoma, 12 (22.2%) cases were metastatic squamous cell carcinoma, and 8 (14.8%) cases were metastatic adenocarcinoma. [9] Ashwini AS et al., found that 7 (40.4%) cases were metastatic infiltrating ductal carcinoma, 6 (26.2%) cases were of metastatic squamous cell carcinoma, and 5 (21.7%) cases were of adenocarcinoma. [4]

The results of this study, in short, demonstrate majority of lymph node lesions in female, affecting age group 21-40 years with frequent of reactive lymphadenitis and metastatic squamous cell carcinoma and infiltrating ductal carcinoma to be the most recurring among neoplastic lesions. This could correspond to the demographic profile, living conditions and healthcare awareness of the patients visiting tertiary care center.

Conclusion

From this study, it is evident that most common pattern in lymph node pathology is reactive lymphadenitis, affecting age group 21-40 years, with prevalent cases affecting females. In developing country such as India, this points to frequent population exposure to infections. This could indicate a need to strengthen primary and secondary levels of preventive measures and to take necessary diagnostic measures towards these diseases. As tuberculosis is found to be affecting females more than males in our study there is a need for proper screening of cases and making population aware of benefits of early diagnosis and treatment which could lead to better outcome.

Acknowledgements: None.

Funding: None

Competing Interests: None declared

References

1. Vinay Kumar, Abul K Abbas, Jon. C. Aster. Diseases of white blood cells, lymph nodes, spleen, and thymus. In: Jerrold R. Turner. Robbins & Cotran Pathologic Basis of Disease. Tenth edition. Philadelphia: Elsevier; 2021: 588.
2. Pagaro PM, Banerjee B, Khandelwal A, Pandey A, Gambhir A. Spectrum of lymph nodes lesions as determined by histopathology. Med J DY Patil University 2017; 10:343-8
3. Shah B, Dgloorkar S, Parab S, Shah M, Vijay R. Analysis of the histopathological findings of lymph node biopsies at a tertiary care centre. Int Surg J 2023; 10:231-4
4. Ashwini Ashoksingh Shiledar, Amitkumar Bapuso Pandav, Santoshsing Shivramsingh Rajput, Ashish Ashoksingh Shiledar. Evaluation of Histopathological Findings in Lymph Node Lesions. Journal of Clinical and Diagnostic Research. 2022 Nov, Vol-16(11): EC37-EC41
5. Lali Krishnan Rajan, Priya Venugopaladas Saraswathy, Sheela Kizhuvelil Mohammed Ali, Deepthi Raj Madambithara Lekshmi. Histomorphological features of neoplastic and non- neoplastic lymph node lesions in a tertiary care hospital in South India. J Evid Based Med Healthc, Vol. 8(22), May 31,2021
6. Pallavi SMS, Manjunatha YA. Study of histopathological spectrum of diagnosis in lymph node biopsies in a tertiary care centre. Indian J Pathol Oncol 2019; 6(3):476-9
7. Khanday SA, Reshi R, Mushtaque M. Histopathology and immunohistochemistry of lymph node biopsies: A prospective study from a tertiary care hospital in Kashmir. Indian J Pathol Oncol 2019; 6(3); 400-405.
8. Dr. Shubhangi V Agale, Dr. Mukund B Tayade, Dr. Rachna Binayake, Dr. Charu Sethi, Dr. Grace F D'Costa, Dr. Sachin Raut. A study of evaluation of histopathological spectrum of lymph node lesions in a tertiary care centre. International journal of Medical and Health research. V0l 4(8); August 2018; 25-29.
9. Damle R, Suryawanshi K, Dravid NV, Newadkar DV, Prashant N. A descriptive study of histopathological patterns of lymph node biopsies in a tertiary care hospital. Deore Annals of Pathology and Laboratory Medicine. 2017; 4(2):131-136
10. Goyal S, Brar BK, Sehgal S. Histopathological and cytological spectrum of lymphadenopathy: a window to preliminary diagnosis. Int J Med Res Rev 2017, 5(10): 900-907.
11. Gupta N, Agarwal P. Spectrum of pathological lesion in superficial lymph node biopsy in a tertiary health centre of western Rajasthan. IOSR J Dent Med Sci 2016; 15(11):62-5.
12. Vidhyadhar R, Prakash CSR, Philip KS. Histopathological study of lymph node lesions. J Int Med Dent 2015; 3:24-33.
13. Roy A, Kar R, Basu D, Badhe BA. Spectrum of histopathologic diagnosis of lymph node biopsies: a descriptive study from a tertiary care centre in South India over 51/2 years. Indian J Pathol Microbiol. 2013 Apr-Jun; 56(2): 103-8.
14. Vachhani AB, Jasani JH, Tandon RK. Histopathological study of lymph node biopsy. Int J Biomed Adv Res 2013;4(11):790- 5.