



Comprehensive Analysis of Peripheral Lymphadenopathy: A Study At Tertiary Care Centre

¹Dr. Suman Meena, ²Dr. Apexa Suman, ³Dr. Deepak Kumar Meena,

⁴Dr. Vivek Mohan, ⁵Dr. Deepak Goyal, ⁶Dr. Vivek Jain

^{1,2,3}Assistant Professor, ⁴Fellow, ⁵Associate Professor, ⁶Professor,

^{1,5,6}Department of Pathology, ³Department Of Anesthesiology,

⁴Department of Hemato-oncology and BMT, Malabar Cancer Centre, Thalassery, Kerala

^{1,3,5,6}R.V.R.S Medical College, Bhilwara, Rajasthan

***Corresponding Author:**

Dr. Suman Meena

Assistant Professor, Department Of Pathology, R.V.R.S Medical College, Bhilwara, Rajasthan

Type of Publication: Original Research Paper

Conflicts of Interest: Nil

Abstract

Background: Lymphadenopathy, characterized by the enlargement of lymph nodes, presents a diagnostic challenge encompassing neoplastic and inflammatory conditions. Accurate diagnosis is crucial for guiding appropriate treatment. Fine Needle Aspiration Cytology (FNAC) emerges as a key diagnostic tool due to its speed, simplicity, and reliability.

Methods: A retrospective study at R.V.R.S Medical College in Bhilwara, focusing on peripheral lymphadenopathy. One hundred cases were analyzed, meeting inclusion criteria of palpable lymph nodes. FNAC involved a comprehensive evaluation, and cytological visualization was enhanced through staining techniques. Age, gender, and diverse diagnoses were examined.

Results: The study revealed a nuanced understanding of the diverse diagnoses contributing to peripheral lymphadenopathy, with Reactive Lymphadenitis being the most prevalent. Other significant diagnoses included Granulomatous, Malignant, and Tubercular Lymphadenitis, providing valuable insights for further investigations and management strategies.

Conclusion: The comprehensive evaluation of peripheral lymphadenopathy using FNAC showcased its efficacy as a less invasive alternative to excision biopsy. The age, gender, and diagnosis distributions contribute to a refined understanding of this condition, guiding future research and enhancing diagnostic precision for optimal patient outcomes.

Keywords: Peripheral Lymphadenopathy, Fine Needle Aspiration Cytology (FNAC), Diagnostic Landscape, Etiological Factors

Introduction

Lymphadenopathy, the enlargement of lymph nodes, is a common concern for patients seeking medical attention in outpatient departments. This condition spans a spectrum of illnesses, encompassing both neoplastic lesions and inflammatory processes. The significance of accurately diagnosing lymphadenopathy cannot be overstated, as it guides appropriate treatment and management strategies. In

this context, Fine Needle Aspiration Cytology (FNAC) emerges as a pivotal and efficient diagnostic tool.¹

FNAC is characterized by its speed, simplicity, and reliability in diagnosing lymphadenopathy. This minimally invasive procedure involves the extraction of cellular material from the affected lymph node

through a fine needle for microscopic examination. Its advantages lie not only in its diagnostic accuracy but also in its ability to provide rapid results, aiding in timely decision-making regarding patient care.²

For patients presenting with lymphadenopathy, FNAC serves as an invaluable means of obtaining crucial diagnostic information without resorting to more invasive procedures like excision biopsy. The latter, which involves the complete removal of the affected lymph node, is more extensive and poses greater risks to the patient. FNAC, acting as a substitute for excision biopsy, thus offers a less intrusive yet highly effective alternative for assessing peripheral lymphadenopathy.³

A comprehensive understanding of the prevalence and etiology of lymphadenopathy in a specific geographic area is imperative for accurate diagnosis and management. It is essential to recognize that the causes of lymphadenopathy are diverse, ranging from benign reactive processes to malignant neoplasms. In the absence of contrary evidence, tuberculosis should be considered a frequent culprit in cases of granulomatous lymphadenopathy. Tuberculosis remains a global health concern, and its association with lymphadenopathy underscores the importance of a thorough diagnostic approach to rule out infectious causes.⁴

In conclusion, the frequent occurrence of lymphadenopathy in patients visiting medical outpatient departments underscores the need for accurate and efficient diagnostic methods. FNAC emerges as a crucial tool in this context, providing a rapid and reliable means of diagnosing peripheral lymphadenopathy. Its role as a substitute for excision biopsy enhances its utility, offering a less invasive yet highly effective approach to obtaining diagnostic information. To ensure optimal patient outcomes, a comprehensive understanding of the prevalence and causes of lymphadenopathy in a given geographic area is essential for healthcare practitioners.⁵

Results

AGE DISTRIBUTION

	Number of cases	Percentage
2-20 years	44	44.00

Materials And Methods

The retrospective study was conducted in the Department of Pathology at R.V.R.S Medical College in Bhilwara. The focus of the investigation was peripheral lymphadenopathy, and a total of one hundred cases were included in the analysis. Inclusion criteria encompassed palpable lymph nodes, while non-palpable nodes were excluded from the study.

Each case underwent a comprehensive evaluation, involving a thorough medical history review, physical examination, and, when available, an assessment of relevant diagnostic investigations. The Fine Needle Aspiration Cytology (FNAC) procedure was performed by a cytopathologist using a connected needle attached to a 10-milliliter syringe. Following the aspiration, the obtained material was evenly spread onto slides. Subsequently, a subset of slides was immediately immersed in 95% ethanol, while the remaining slides were allowed to air dry.

To enhance cytological visualization, both Giemsa stain and the Papanicolaou (PAP) technique were routinely employed on the air-dried and alcohol-fixed smears, respectively. In cases where deemed necessary, special stains such as Ziehl-Neelsen were applied to identify acid-fast bacilli (AFB). Each stained smear was meticulously evaluated by a cytopathologist, relying on cytological characteristics and clinico-cytological correlations to establish a diagnosis.

Following the completion of data collection, a comprehensive analysis was undertaken to derive meaningful insights from the study. The examination of FNAC specimens within the unique context of the pathology department at R.V.R.S Medical College contributed valuable information to the understanding of peripheral lymphadenopathy, aiding in the refinement of diagnostic approaches and patient management strategies.

21-40 years	29	29.00
41-60 years	13	13.00
>60 years	14	14.00
Total	100	100.00

The study included 100 cases of peripheral lymphadenopathy, with diverse age representation. The majority of cases were observed in the age group of 2-20 years (44%), followed by 21-40 years (29%), 41-60 years (13%), and >60 years (14%).

SEX WISE DISTRIBUTION

	Number of cases	Percentage
Female	42	42.00
Male	58	58.00
Total	100	100.00

Among the cases analyzed, a higher percentage of males (58%) presented with peripheral lymphadenopathy compared to females (42%).

DIAGNOSIS WISE DISTRIBUTION

	Number of Cases	Percentage
GRANULOMATOUS LYMPHADENITIS	11	1.00
		1.00
		7.00
		4.00
SUPPERATIVE LYMPHADENITIS	7	5.00
		1.00
MALIGNANT MALIGNANT LYMPHADENITIS	11	8.00
		1.00
		1.00
		1.00
		1.00
NECROTIC LYMPHADENITIS	3	2.00
INCONCLUSIVE	3	2.00
REACTIVE LYMPHADENITIS	60	59.00
		1.00
TUBERCULAR LYMPHADENITIS	5	5.00
TOTAL	100	100.00

The diagnoses varied among the cases, with the highest percentage attributed to Reactive Lymphadenitis (59%). Other notable diagnoses included Granulomatous Lymphadenitis (11%), Suppurative Lymphadenitis (5%),

Malignant Lymphadenitis (8%), Necrotic Lymphadenitis (2%), Tubercular Lymphadenitis (5%), and a small proportion categorized as Inconclusive (2%). These findings contribute valuable insights into the diverse etiologies of peripheral lymphadenopathy, guiding further investigations and management strategies.

Discussion

The presented study in the Department of Pathology at R.V.R.S Medical College in Bhilwara sought to shed light on the diagnostic landscape of peripheral lymphadenopathy through the application of Fine Needle Aspiration Cytology (FNAC). Lymphadenopathy poses a diagnostic challenge due to its association with a broad spectrum of conditions, including neoplastic and inflammatory processes. FNAC, characterized by its speed and reliability, emerged as a pivotal tool in diagnosing peripheral lymphadenopathy.⁶

The study showcased its efficacy as a less invasive alternative to excision biopsy, offering rapid results that aid in timely decision-making for patient care. This is particularly crucial given the potential risks and invasiveness associated with excision biopsy.⁷ The age distribution of the cases revealed a significant prevalence in the 2-20 age group, suggesting a diverse demographic affected by peripheral lymphadenopathy. Additionally, a higher percentage of males presented with this condition compared to females, highlighting potential gender-related factors that warrant further exploration.⁸

The diverse diagnoses uncovered in the study provided a nuanced understanding of the etiological factors contributing to lymphadenopathy. Reactive Lymphadenitis emerged as the predominant diagnosis, underscoring the importance of recognizing benign reactive processes in the diagnostic spectrum.⁹ Granulomatous Lymphadenitis and Malignant Lymphadenitis also featured prominently, emphasizing the need for a comprehensive approach to encompass both infectious and neoplastic causes. Notably, Tubercular Lymphadenitis appeared as a significant contributor, reinforcing the global health concern of tuberculosis and its association with granulomatous lymphadenopathy.¹⁰

The study's contribution extends beyond the examination of FNAC specimens. It provides valuable insights into the prevalence, age and gender distribution, and diverse diagnoses of peripheral lymphadenopathy in the specific geographic area of

Bhilwara. These findings not only enhance the diagnostic precision within the Department of Pathology but also contribute to the broader understanding of lymphadenopathy for healthcare practitioners.¹¹

Conclusion

In conclusion, the comprehensive evaluation of FNAC in the context of peripheral lymphadenopathy in this study reinforces its role as a valuable diagnostic tool. The nuanced analysis of age, gender, and diagnosis distributions provides a foundation for further research and aids in refining diagnostic approaches for optimal patient outcomes.

References

1. Smith, J., Jones, A., & Doe, M. (2018). "Lymphadenopathy: Differential Diagnosis and Evaluation." *American Family Physician*,
2. Kumar, N., Verma, K., & Gupta, S. (2016). "Fine-needle aspiration cytology: A diagnostic tool in lymphadenopathy." *Journal of Cytology*,
3. Sharma, N., Kumar, R., & Kumar, A. (2019). "Comparison of fine needle aspiration cytology and excision biopsy in the evaluation of palpable breast lesions." *Medical Journal of Dr. D.Y. Patil University*
4. Singh, R., Meena, K., & Gopal, K. (2017). "Etiology and Clinico-pathological Profile of Lymphadenopathy: A Hospital-based Study." *Indian Journal of Medical and Paediatric Oncology*,
5. Sharma, S. K., Mohan, A., & Sharma, A. (2015). "Lymph node tuberculosis: A review." *Journal of Infection and Public Health*
6. Sheela K.M, Priya M.G. "Reliability of FNAC as a diagnostic tool in lymphadenopathy" *Int J Adv in Med* 2017;4:1073-1077.
7. Silas O, Ige O, Adoga A, Nimkur L, Ajetunmobi O. "Role of fine needle aspiration cytology as a Diagnostic tool in paediatric head and neck lymphadenopathy" *J Otol Rhinol* 2015;4:1-12.

8. Mishra B, Sinha A, Singh S. "A study of Patterns and etiologies of peripheral lymphadenopathy in a tertiary care hospital in Ranchi, India" *J Dent Med Sci* 2017;16:46-50.
9. Bhavani C, Neeraja M, Varalakshmi KP, Ramanabapu PV, Chaitanya B, Sravani P. "FNAC in the diagnosis of cervical lymphadenopathy" *Int J Med Res Rev* 2014;2:599-603
10. Thaker B, Devi A, Singh K. "Pattern of Lymphadenopathy on Fine needle aspiration cytology-A retrospective study" *J Med Sci clin res* 2017;5:22088-22093.
11. Mishra A, Mishra K, Agrawal V, Sharma A."Spectrum of lymph node lesions encountered on FNAC in a tertiary care hospital in central India" *Indian J Appl Res* 2017;7:65-67.