

ORIGINAL RESEARCH

Clinicopathologic profile of peripheral lymphadenopathy in children at tertiary care hospital in North Maharashtra

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ABSTRACT

Background: Peripheral lymphadenopathy (PL) is a common clinical entity in pediatric practice. Essential diagnostic considerations include the age of the patient, the site of the abnormal lymph nodes, the duration of lymphadenopathy, any associated signs or symptoms, the presence or absence of generalized lymphadenopathy, any extra-nodal signs or symptoms, and the presence or absence of splenomegaly and or fever. The critical task in approaching patients with lymphadenopathy is to diagnose nodes likely to be related to benign, self-limited conditions and which nodes indicate malignancy or other serious condition requiring specific treatment.

Several studies have attempted to identify various characteristics, which may provide useful information to determine the etiology of lymphadenopathy in children. Still a significant number of patients remain with persistent lymphadenopathy, in which the etiology is unclear. **Objectives:** To evaluate the clinico pathological picture of peripheral Lymphadenopathy in children. **Material and Methods:** The research was carried out at the Department Pathology on Pediatric patients in a tertiary care hospital for a period of one year. Total 120 children (<16 years) with significant peripheral lymphadenopathy were studied with FNAC and subsequent biopsy wherever available. Relevant clinical data was analyzed. **Results:** Most of the participants (39.2%) were 5-10 years age group, predominantly male (55%) most of them (67.5%) residing in rural areas, 45% belong to lower socio-economic class. Most common presenting complaint was neck swelling alone (89.2%). Cervical (70%) was commonest lymph node group involved. FNAC in categorizing different types of lymphadenopathy in children revealed were reactive lymphadenitis was the commonest (66.7%) followed by tubercular lymphadenitis (16.7%). **Conclusions:** The most frequent cause for lymphadenopathy in pediatric population is reactive hyperplasia followed by tuberculosis. FNAC alone can be useful in establishing diagnosis in large number of cases in proper clinical setting and obviates the need for invasive procedures like surgery.

Key words: Peripheral lymphadenopathy, children, FNAC.

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INTRODUCTION

Significant lymphadenopathy is defined as a lymph node with a diameter exceeding one cm for cervical and Axillary nodes and 1.5 cm for inguinal nodes ¹. Lymphadenopathy is one of the most common presenting complaints in pediatric age group with varied differential diagnosis; evaluation of a child with lymphadenopathy is a common clinical scenario for surgeons ². Eighty percent to ninety percent of kids have cervical nodes that can be felt. Infant lymph nodes may be palpated as early as the neonatal period

³. Being a part of the reticulo-end lymph nodes serve as the termination point for lymphatic vessels that drain lymph from most tissues of the body. Presence of abundant phagocytic cells, antigen presenting cells and lymphocytes provides ideal first line of defense against pathogens. As a result, most of the normal children have palpable cervical lymph nodes ⁴. The important point is to decide whether they are abnormally enlarged if so, whether associated with serious underlying pathology. Palpable supraclavicular nodes are always considered abnormal

or a lymph node is considered as abnormally enlarged if it measures more than 10mm in its longest diameter⁵. Enlargement of two or more non-contiguous lymph node regions is known as generalized lymphadenopathy, usually secondary to systemic infections⁶. The broad etiologic categories of lymph node enlargement include:

- i) An immune response to infective agents (e.g. bacteria, virus, fungus).
- ii) Inflammatory cells in infections involving the lymph node.
- iii) Infiltration of neoplastic cells carried to the node by lymphatic or blood circulation (i.e. metastasis).
- iv) Localized neoplastic proliferation of lymphocytes or macrophages (e.g. leukemia, lymphoma).
- v) Infiltration of macrophages filled with metabolic deposits (e.g. storage disorders)^[6-7].

In developing countries like India, acute respiratory tract infections, suppurative skin infections, and tuberculosis are the major causes for lymphadenopathy, while malignancies have been the predominant etiology in developed countries^[8-10]. Fine needle aspiration cytology (FNAC) is the first line of investigation for any individual with lymphadenopathy. It has been proven to be a rapid, minimal invasive, cost-effective and reliable diagnostic tool. However, FNAC has certain limitations in the diagnosis of malignancy as aspirated material is insufficient for marker studies and cytogenetics. So confirmation in such cases is done by open biopsy and histopathological examination (HPE)¹¹⁻¹².

AIM: The objectives of this research were to identify the causes of severe cervical lymphadenopathy in children and evaluate the link between clinical and pathological findings.

This research may help in accurately diagnosing and treating lymphadenopathy in children.

MATERIAL AND METHODS

The study was carried out at the Department of Pathology on Pediatrics patients in a tertiary care hospital for a period of one year from December 2022 to December 2023.

Table 1: Socio-demographic profile of study participants

Socio-demographic profile		Frequency	Percentage
Age group	1-5 years	25	20.8%
	6-10 years	47	39.2%
	11-15 years	38	31.7%
	>15 years	10	8.3%
Gender	Male	66	55%
	Female	54	45%
Residence	Rural	81	67.5%
	Urban	39	32.5%
Socio-economic class	Lower	54	45%
	Middle	43	35.8%
	Upper	23	19.2%

The research comprised children with peripheral lymphadenopathy who attended Pediatric OPD and were admitted to the Pediatric Department and send for FNAC to Pathology throughout the study period. Written inform consent was obtained from the parents or guardians for the participation of the study.

INCLUSION CRITERIA

- Children age group between 1 to 16 years.
- Clinically palpable peripheral lymphadenopathy.
- Whose parents or guardians provide consent for the study.

EXCLUSION CRITERIA

- Children less than 1 and more than 16 years of age.
- Whose parents or guardians not provide consent for the study.

The following data were retrieved from the charts: age, sex, chief complaint, location of the lymph node, duration of the lymph node enlargement, size of the lymphadenopathy, type of biopsy done, final diagnosis, and management of the patient. The Mantoux test was performed on all patients as part of their usual workup. Fine needle aspiration cytology (FNAC) was performed on all patients in the study group after a swab was collected from the most prominent node in patients with the source of infection for culture and sensitivity. Relevant tests were performed on individuals with suspected systemic illnesses or malignancies.

STATISTICAL ANALYSIS: The data was analyzed using Statistical Package for the Social Sciences software version 18.0 (SPSS Inc, Chicago). Obtained parameters were evaluated using descriptive statistical analysis and presented in terms of percentage.

RESULTS

Total 120 patients of less than 16 years of age with lymphadenopathy were enrolled in our study. Majority of the patients were 5- to 10-year-old age group (39.2%), followed by the 11- to 15-year-old age group (31.7%). Male was slightly predominant (55%) than female. [Table 1]

Cervical lymphadenopathy was the most common (70%) followed by inguinal (10%) [Figure 1]

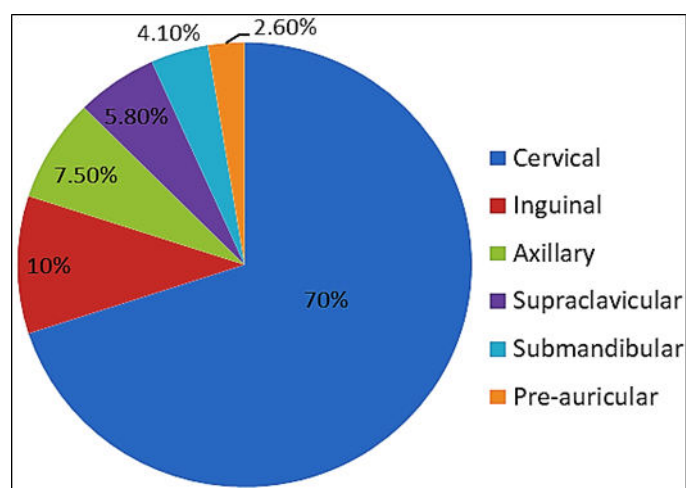


Fig 1: Site of lymphadenopathy in study patients

Most common clinical manifestation was swelling alone (89.2%). Other manifestations included fever, cough, cold, weight loss, sore throat, rash and discharge from the swelling in various combinations. [table 2]

Table 2: Presenting symptoms in children with lymphadenopathy

Clinical profile	Frequency	Percentage
Neck swelling	107	89.2%
Fever	103	85.8%
Cough	90	75%
Decreased appetite	58	48.3%
Weight loss	54	45%
Sore throat	40	33.3%
Ear discharge	12	10%
More than 1 symptoms	93	77.5%

Tonsillitis, pharyngitis, skin lesion and rashes were commonly associated with the pediatric lymphadenopathy [Figure 2]

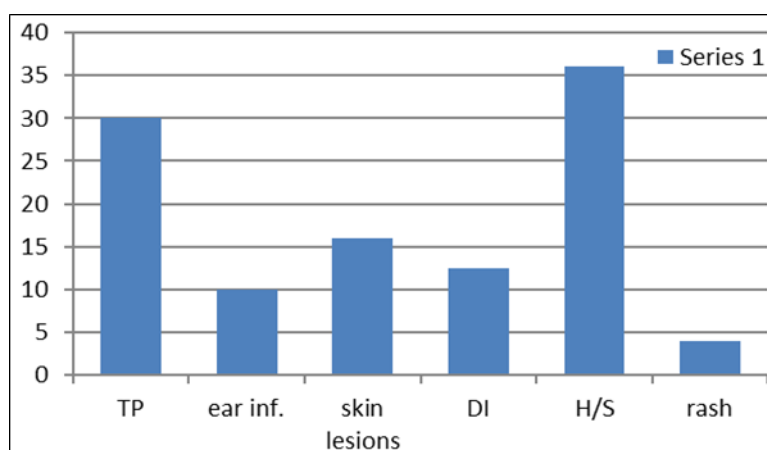
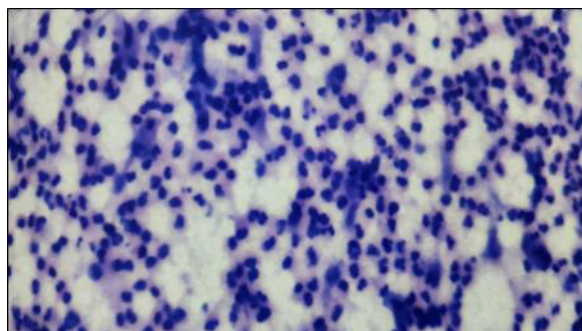
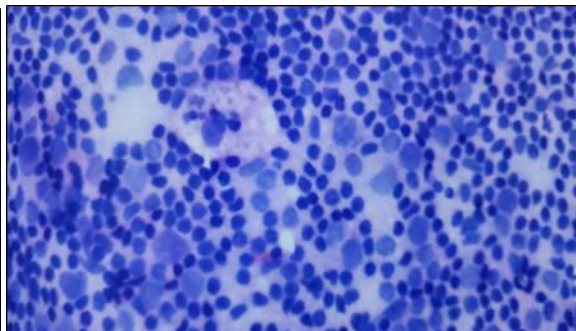
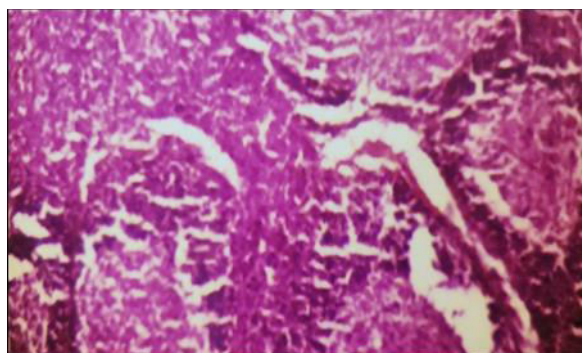
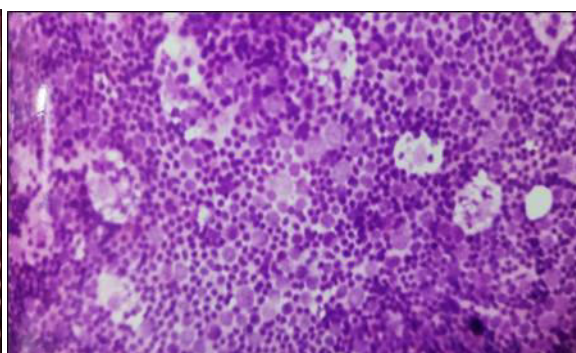
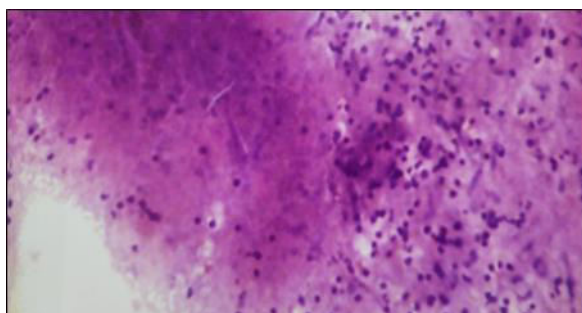
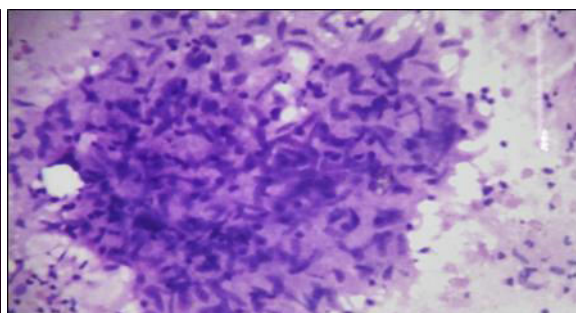


Fig 2: Associated findings in children presenting with lymphadenopathy

On FNAC finding revealed reactive hyperplasia was the most common (66.7%) followed by tuberculosis cytology (16.7%) [table 3]

Table 4: Fine needle aspiration cytology

Cytology	Number	%
1. Benign lymphadenopathy		
Reactive hyperplasia	80	66.7%
Tuberculosis	20	16.7%
Suppurative	9	7.5%
Other: Kikuchi Fujimoto Disease	2	1.7%
2.Malignancy Lymphoma		
a) Hodgkin lymphoma	3	4.2%
b) Non-Hodgkin lymphoma	2	
Inadequate material for opinion/ unsatisfactory	4	3.3

**Fig 3: Acute suppurative lymphadenitis.Cytology (10xH&E)****Fig 4: Nonspecific Lymphadenitis.Tissue section (40xH&E)****Fig 5: Nonspecific Lymphadenitis. Mixed lymphoid cells with tangible body macrophages (10xH&E)****Fig 6: Nonspecific LAN, Mixed lymphoid cells & Numerous tangible body macrophages (10xH&E)****Fig 7: Tuberculous lymphadenitis caseous necrosis (40xH&E)****Fig 8: Tuberculous lymphadenitis, Epithelioid cell granuloma (40xH&E)**

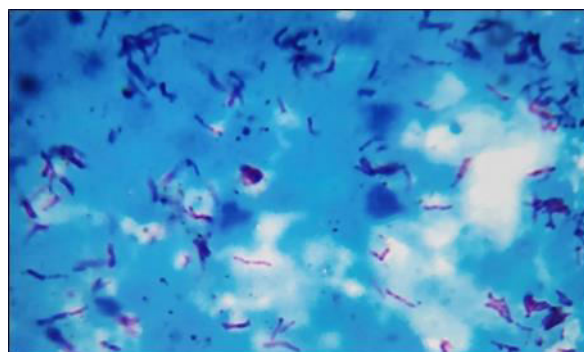


Fig 9: Tuberculous lymphadenitis. Acid-fast bacilli (40xZ-N stain)

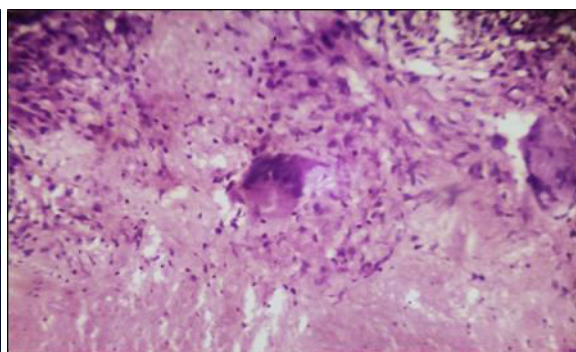


Fig 10: Tuberculous lymphadenitis, Tissue section, Granuloma with langerhans giantcell (40xH&E)

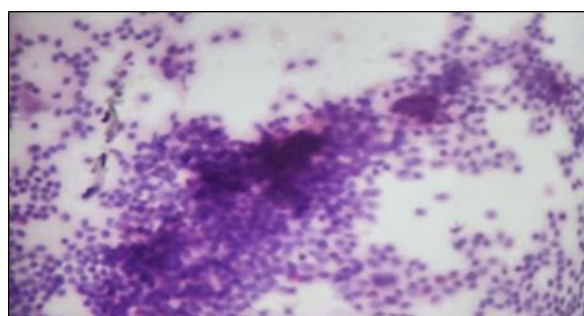


Fig 11: Hodgkin Lymphoma cytology misdiagnosed as Nonspecific lymphadenitis (10xH&E)

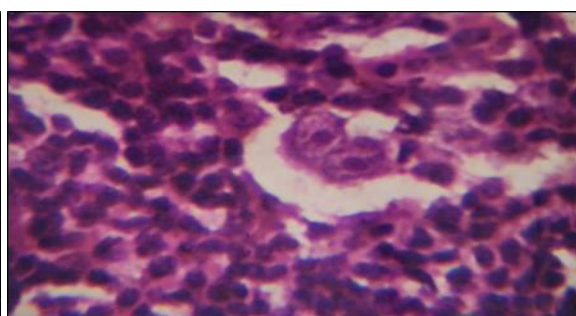


Fig 12: Hodgkin Lymphoma cytology tissue section Classic RS cell (40xH&E)

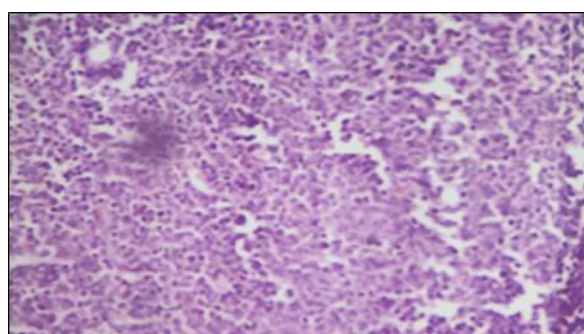


Fig 13: Non-Hodgkin Lymphoma Tissue section (10xH&E)

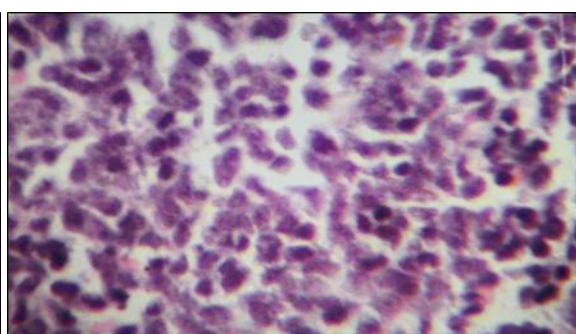


Fig 14: Non-Hodgkin lymphoma tissue section, Diffuse large cell lymphoma (40Hx&E)

DISCUSSION

During the current study an attempt was made to study the etiology of children presenting with peripheral lymph node enlargement after correlating the clinical and FNAC findings with those of the laboratory abnormalities.

In the present study majority of the patients were in the age group of 5-10 years (40.7%) followed by 11-15 years (37.6%). Normal peak lymphatic growth occurs in the age group of 5-10 years. Our results were similar with M Sunil *et al.*¹³ whereas Knight *et al.*¹⁴ said that age is not a factor in predicting the occurrence of severe lymphadenopathy.

Our study showed male preponderance (77%). A similar study on the clinico-pathological profile of lymphadenopathy done in India also showed male predominance¹⁵, although, it further stated that there is no predilection for lymphadenopathy with regards to gender¹⁶. This could be due to the prevailing

custom of providing more attention to male children in Indian society rather than the real increased biological susceptibility in boys.

In majority of patients the presenting symptom was swelling in the region of neck (90%), followed by fever (90%) and cough (52.9%). This was similar to the study by Reddy MP *et al.*¹⁷ and Tanteo *et al.*¹⁸. Current study found, Tonsillitis and/or Pharyngitis; ear infection, skin lesions over scalp, orodental infection and rashes were the common finding associated with the peripheral lymphadenopathy, Accordance to Dajani S *et al.*¹⁹.

Bedside FNAC was done in all the cases as a primary diagnostic tool in the evaluation of children with cervical lymphadenopathy. In the present study cytological material in 97.7% cases was deemed adequate for diagnosis. In 2.3% the material was inadequate for giving any opinion. In majority of the cases in present study cytological picture was of

reactive hyperplasia (76.2%), concordance to Annam V *et al.*²⁰ and El Hag *et al.*²¹.

The second most common diagnosis was tubercular lymphadenitis (30.2%). In India lymphadenopathy is the common presentation of extra pulmonary tuberculosis with massive economical implication on the health care system. It is also resurging due to the increasing incidence of Human Immunodeficiency²²⁻²³.

CONCLUSION

Lymphadenopathy in pediatric population is always a diagnostic challenge. In a resource limited facility it can be an important diagnostic tool available for initial assessment and to plan the further course of management. The most prevalent cause of lymphadenopathy in children is reactive lymphadenitis, followed by TB. FNAC is a simple with minimum complications with good diagnostic accuracy. It can be used as a primary diagnostic test in children with peripheral lymphadenopathy.

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