



PAEDIATRIC CERVICAL LYMPHADENOPATHY : A CLINICO-CYTOLOGICAL CORRELATION

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ABSTRACT

Lymph nodes are affected in many infectious, autoimmune, metabolic and malignant diseases¹. The cervical lymph nodes are particularly important because they are the first drainage stations for key points of contact with the outside world (mouth/throat/nose/eyes/ears/respiratory system) – a critical aspect especially among children – and can represent an early clinical sign in their exposed position on a child's slim neck¹. In the present article we includes total 100 cases of lymphadenopathy in paediatric age with the aim to establish a correlation between clinical presentation and cytological findings as well as to review the pathophysiology, aetiology, and management of children with cervical lymphadenopathy. Out of total 100 patients, 71 (71%) had smaller sized (<2 cm) lymph nodes, most of them were present since a long period i.e. from so many months or even years to gather and the number of lymph nodes were variable from single, two or even multiple, 29 (29%) patients had larger sized (<2cm) lymph nodes. On cytomorphological analysis, we observed that out of total 100 patients, 71 (71%) patients had small (<2 cm.) sized lymph nodes, and out of these 71 patients 62/71 (87.32%) , 62/100 (62%) , were given a diagnosis of reactive lymphoid hyperplasia, 04/71 (05.63%) , 04/100 (04%), patients were diagnosed to have granulomatous lymphadenopathy- tuberculosis, 05/71 (07.04%) ,05/100 (05%) patients had tubercular abscess. Out of 100 patients 29 (29%) were found to have large (≥ 2 cm.) sized lymph nodes out of these 05 patients (17.24%), (05%) had reactive lymphoid hyperplasia, 14 patients (48.27%), given a diagnosis of granulomatous lymphadenitis- tuberculosis, 06 patients (20.68%) ,(06%) tubercular abscess, 03 patients (10.34%), (03%) Hodgkin's lymphoma, and 01 patient (03.45%), (01%) was given a diagnosis of Non-Hodgkin's lymphoma.a

KEYWORDS : Neck lymph-nodes, Paediatric lymphadenopathy, Child hood lymph nodes.

Introduction:

The lymph nodes are an essential part of the body's immune system¹ and function to fight disease and infections². Lymph nodes play a role of filters for the lymph fluid as it circulates throughout the body². They are affected in many infectious, autoimmune, metabolic and malignant diseases¹. The cervical lymph nodes are particularly important because they are the first drainage stations for key points of contact with the outside world (mouth/ throat/nose/ eyes/ears/ respiratory system) – a critical aspect especially among children – and can represent an early clinical sign in their exposed position on a child's slim neck¹. Lymphadenopathy is a disease process which involves lymph nodes that are abnormal in consistency and size². Lymphadenitis refers specifically to lymphadenopathies which are caused due to inflammatory processes. Cervical lymphadenopathy is a common problem encountered in pediatric patients and is mostly attributable to infectious etiologies². The condition most commonly represents a transient response to a benign local or generalized infection, but occasionally it might herald the presence of a more serious disorder³. Acute bilateral cervical lymphadenopathy usually is caused by a viral upper respiratory tract infection or streptococcal pharyngitis. Acute unilateral cervical lymphadenitis is caused by streptococcal or staphylococcal infection in 40% to 80% of cases. The most common causes of subacute or chronic lymphadenitis are cat scratch disease, mycobacterial infection, and toxoplasmosis. Generalized lymphadenopathy is often caused by a viral infection, and less frequently by malignancies, collagen vascular diseases, and medications. If there is enlarged lymph nodes, the first step should be to establish whether the lymph node itself is enlarged: this is the case above a diameter of >2 cm and is defined as lymphadenopathy. A distinction is made between an acute (<2 weeks), subacute (2–6 weeks) and chronic (>6 weeks) course of the lymphadenopathy. Enlarged cervical lymph nodes are common in children (Leung & Robson, 1991)³. About 38% to 45% of otherwise normal children have palpable cervical lymph nodes (Larsson et al., 1994)⁴. Cervical lymphadenopathy most commonly represents a transient response to a benign local or generalized infection, but occasionally it might

herald the presence of a more serious disorder such as malignancy⁵. In the present article we includes total 100 cases of lymphadenopathy in paediatric age with the aim to establish a correlation between clinical presentation and cytological findings as well as to review the pathophysiology, etiology, and management of children with cervical lymphadenopathy.

Materials and Methods:

The present study has been carried out in the department of pathology, Government Medical College, Saharanpur, UP. In this study we included total 100 cases of lymphadenopathy in paediatric age i.e. less than 1 year to 12 years of age group children who were present in paediatric out door patient department in Government Medical College, Saharanpur, UP during past 2 years i.e. from April 2015 to April 2017, with enlarged cervical lymph-nodes associated with other multiple complaints such as fever, sore throat, cough, loss of appetite and weight loss, of course some did not have any symptoms apart from cervical lymph-node enlargement. Fine needle aspiration has been done by using 22 gauge and 26 gauge needles and 10 ml disposable syringe attached with a Franzmen's syringe holder. In each case 1-2 slides are wet fixed in 90% ethyl alcohol for Papanicolaou staining, 2-3 slides dry fixed for Giemsa stain and one slide for ZN stain for AFB.

In every case we perform clinical examination and maintain a performa as given below-

Proforma for Clinical Evaluation:⁶

History	Examination
Duration of lymphadenopathy	General Appearance: Malnutrition, poor health, febrile, toxic
Fever, anorexia, myalgias, night sweats	Rash, pallor, erythema, edema
Node is tender or nontender	Poor dental hygiene, otitis, pharyngitis
Toothache, earache,	Lymph node examination for size, mobility, consistency, tenderness
	Location of lymphadenitis: Unilateral versus bilateral

bone pain Bruising, pallor ,Sore throat, URTI symptoms Preceding tonsillitis, Contact with tuberculosispatients, Medications/Immuni zations Exposure to animals/ cats Use of medications like phenytoin or isoniazid Recent immunization history with diphtheria-pertussis-tetanus (DPT), poliomyelitis, or typhoid vaccination	Associated findings of lungs consolidations/hilar lymphadenopathy/TB/hepatosplenomegaly Associated inguinal and axillary adenopathy
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Definitions:

Cervical lymphadenopathy is a very common but challenging medical condition for the family as well as the treating physician⁶. Lymphadenopathy is a disease process which involves lymph nodes that are abnormal in consistency and size. Lymphadenitis refers specifically to lymphadenopathies which are caused due to inflammatory processes². Cervical lymphadenopathy is a common problem encountered in pediatric patients and is mostly attributable to infectious etiologies. Around 90% of children aged 4-8 years old have cervical lymphadenopathy⁷.

Pathological lymph Nodes:

1. Abnormal lymph nodes- 2 cm. In size
2. Acute lymphadenopathy 2 weeks duration
3. Subacute lymphadenopathy - (2-6 weeks) duration
4. Chronic lymphadenopathy - (>6 weeks) duration

Pathophysiology of Cervical Lymphadenopathy:

The pathophysiology differs according to the etiology which may be infectious or noninfectious. After an initial insult with infections of upper respiratory tract, teeth or soft tissue of the face or scalp, microorganisms are carried to the draining lymph nodes via afferent lymphatics. The cervical lymphatic system plays a role of defence against the infections that occur in the head and neck region⁸. Once the organisms enter into the lymph nodes, the macrophages and dendritic cells trap, phagocytose, and present the organisms as antigens to T cells. B cells with the help of T cells are activated and release immunoglobulins which help in the immune response. The signs and symptoms are a result of this immune response. Nodal enlargement occurs due to cellular hyperplasia and lymphocyte infiltration⁹. Swelling and erythema occur as a result of dilation of blood vessels.

When lymphadenopathy occurs as part of malignant process, the lymph node enlargement is due to malignant or metastatic cells.

Classification of Cervical Lymphadenopathy Based on Clinical Presentation¹⁰:

1. Acute Unilateral: This is the most common type of cervical lymphadenopathy. This is usually reactive and secondary to upper respiratory tract infection (URTI), skin infection, or dental infection. Other rare causes are Kawasaki, cat scratch disease (Bartonella) and Kikuchi-Fujimoto disease (histolytic necrotising lymphadenitis).
2. Acute Bilateral: This type of lymphadenitis occurs secondary to viral URTI, Epstein-Barr virus (EBV), and cytomegalovirus (CMV).
3. Sub-acute: The common cause for this is Mycobacterium tuberculosis.
4. Chronic: This can be reactive in process secondary to neoplasia, lymphoma, leukemia, or soft tissue tumours.

Observations:

The present study has been carried out in the department of pathology, Government Medical College, Saharanpur, UP. In this study we included total 100 cases of lymphadenopathy in paediatric age i.e. less than 1 year to 12 years of age group children who were present in paediatric out door patient department in Government Medical College, Saharanpur, UP during past 2 years i.e. from April 2015 to April 2017.

Out of 100 cases 58 (58%) were male and 42 (42%) were female patients as shown in table 1. As far as age is concerned maximum 56 (56%) children were between age 2 year to 10 years of age as shown in table 2.

No. of male Patients	No. of Female patients	Total
58 (58%)	42 (42%)	100 (100%)

Table 1: Shows sex distribution of the patients

As far as age is concerned maximum 56 (56%) children were between age 2 year to 10 years of age as shown in table 2.

S.No.	Age (Years)	No. of Patients
1.	00 - 01	10
2.	1.1- 02	19
3.	2.1- 03	18
4.	3.1- 05	15
5.	5.1- 07	12
6.	7.1- 10	11
7.	10.1- 12	15
	Total	100

Table 2: Shows age wise distribution of the patients

On clinical evaluation we observed that out of total 100 patients, 71 (71%) had smaller (<2 cm) most of them were present since a long period i.e. from so many months or even years to gather and the number of lymph nodes were variable from single, two or even multiple small lymph nodes. 29 (29%) patients had larger sized (>2 cm) multiple lymph nodes which were present from comparatively shorter duration i.e. less than one month to few months with variable number of lymph nodes single to multiple, as shown in table no. 3.

S. No.	No. of Patients	Average size of lymph node (c.m.)	No. of lymph nodes
1.	71 (71%)	<2 c.m.	Single to multiple
2.	29 (29%)	>2 c.m.	Single to multiple
Total	100 (100%)		

Table 3: Shows number of patients with size and number of lymph nodes

On cytomorphological analysis, we observed that out of total 100 patients 71 (71%) patients had small (<2 cm.) sized lymph nodes, and out of these 71 patients 62/71 (87.32%), 62/100 (62%) , were given a diagnosis of reactive lymphoid hyperplasia , 04/71 (05.63%) , 04/100 (04%), patients were diagnosed to have granulomatous lymphadenopathy- tuberculosis, 05/71 (07.04%) ,05/100 (05%) patients had tubercular abscess . Out of 100 patients 29 (29%) were found to have large (>2 cm.) sized lymph nodes out of these 05 patients (17.24%), (05%) had reactive lymphoid hyperplasia, 14 patients (48.27%), (14%) given a diagnosis of granulomatous lymphadenitis- tuberculosis, 06 patients (20.68%) ,(06%) tubercular abscess, 03 patients (10.34%), (03%) Hodgkin's lymphoma, and 01 patient (03.45%), (01%) was given a diagnosis of Non-Hodgkin's lymphoma, as shown in table 4.

S.No.	No. of patients with Small sized lymph nodes (<2 c.m.)	Cytopathological Diagnosis	No. of patients with Large sized lymph nodes (>2 c.m.)	Cytopathological Diagnosis
1.	62 (62%) 87.32%	Reactive Lymphoid hyperplasia	05 (05%) (17.24%)	Reactive Lymphoid hyperplasia

2.	04 (04%) (5.63%)	Granulomatous lymphadenitis-Tubercular	14 (14%) (48.27%)	Granulomatous lymphadenitis-Tubercular
3.	05 (05%) (07.04%)	Tubercular Abscess	06 (06%) (20.68%)	Tubercular Abscess
4.	-	-	03 (03%) (10.34%)	Hodgkin's Lymphoma
5.	-	-	01 (01%) (03.45%)	Non- Hodgkin's Lymphoma
Total	71		29	100

Table 4: Shows a correlation of size of lymph nodes with the cytomorphological diagnosis

We observed that out of total 100 patients with lymphadenopathy 45 patients (45%) had bilateral cervical lymph nodes while 55 (55%) were with unilateral cervical lymph nodes. We also tried to differentiate enlarged lymph nodes from other possible causes of neck swellings, such as midline thyroglossal cysts and branchial cysts, lipoma, vascular malformations, paraganglioma/neurinoma, lesions of the salivary or thyroid glands, lymphangioma, teratoma, epidermal cysts, and ectopic thyroid tissue, and we did not include any of them in the study.

Discussion:

The present study has been carried out in the department of pathology, Government Medical College, Saharanpur, UP. In this study we included total 100 cases of lymphadenopathy in paediatric age i.e. 1 year to 12 years of age group children who were present in paediatric out door patient department in Government Medical College, Saharanpur, UP during past 2 years i.e. from April 2015 to April 2017. On cytomorphological analysis, we observed that 71% patients having small (<2 cm.) sized lymph nodes, and out of these 71 patients 62/71 (87.32%) , were given a diagnosis of reactive lymphoid hyperplasia i.e. most of the small lymph nodes are found to be reactive on cytopathology, and cause is mostly non specific, i.e. definite aetiology could not be established, our findings are consistent with that of Peter and Edwards, 2000. Mostly this is observed in small children i.e. 1-6 years of age. Variable causes are suggested as immunodeficiency, malnutrition, low birth weight etc, however such lymph nodes usually regress as the child grow. As far as treatment is concerned, it is the reassurance, counselling, immunobusters and improved nutrition. Out of 71 patients with small (<2 cm.) only 09 i.e. 12.67% were found to have tuberculosis on cytopathology. These findings define the role of FNA and cytological study in the correct diagnosis and further management of patients.

Out of total 100 patients 29 (29%) had larger sized (≥ 2 cm.) lymph nodes, out of these 29 cases, 20 patients (68.97%) were diagnosed to have tubercular lymphadenitis, 03 (10.34%) were diagnosed to have Hodgkin's lymphoma, 01(3.45%) was diagnosed to have non-Hodgkin's lymphoma, while only 05 (17.24%) patients were given reactive lymphoid hyperplasia on cytomorphology. These findings suggest that most of the smaller lymph nodes are reactive in nature while larger lymph nodes are mostly have definite pathological cause like tuberculosis, Hodgkin's lymphoma, non- Hodgkin's lymphoma, and of course non- specific reactivity as well. So cytopathology have a definite role to rule out various causes of cervical lymph adenopathy and FNAC should be done in each and every case of lymphadenopathy.

Conclusion:

The present study concludes that most of the children between age 1-6 years presented with smaller size lymph nodes (< 2 cm.) have non- specific reactive lymphoid hyperplasia, while the large sized (≥ 2 cm) lymph nodes in children of any age group, mostly have a definite pathology. Smaller lymph nodes usually regress

spontaneously as the child grow, and with the improvement in the general health status of child, hence there should not be much panic, however still FNAC diagnosis in mandatory as small lymph nodes may also herald some more serious diagnosis, although chances are very less.

References:

- Stephan Lang, Benjamin Kansy. Cervical lymph node diseases in children.GMS Current Topics in Otorhinolaryngology- Head and Neck Surgery.2014;13:Doc 08.
- Gosche JR, Vick L. Acute, subacute, and chronic cervical lymphadenitis in children. Semin Pediatr Surg. 2006;15:99-106.
- Leung, A. K., & Robson, W. L. (1991). Cervical lymphadenopathy in children. Canadian Journal of Pediatrics, 3, 10-17.
- Larsson, L. O., Bentzon, M. W., Berg, K., Mellander, L., Skoogh, B. E., Stranegård, I. L., et al. (1994). Palpable lymph nodes of the neck in Swedish school children. Acta Paediatrica, 83, 1092-1094.
- Leung A.K.C., Robson WL. Childhood Cervical Lymphadenopathy. J Pediatr Health Care, 2004; 18(1).
- Pediatric Cervical Lymphadenopathy . Ground Rounds Presentation. The University of Texas Medical Branch, Department of Otolaryngology, Sep 2009.
- Park YW, Evaluation of neck masses in children. Am, Family Physician, 1995;51:1904-1912.
- Darne Sachin, Rajda Trusha. Cervical Lymphadenopathy in Children – A Clinical Approach. International Journal of Contemporary Medical research, 3:4, April 2016; 1207-1210.
- Paediatric Guidelines 2013-2014, www.networks.nhs.uk.
- Peters, T. R., & Edward, K. M. (2000). Cervical lymphadenopathy and adenitis. Pediatrics in Review, 21,399-404.