

## ORIGINAL RESEARCH

# Cervical Lymphadenopathy In Children- A Retrospective Study

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## ABSTRACT

**Introduction:** Cervical lymph node enlargement in children is a common problem encountered in public hospitals. This retrospective study was conducted to observe various causes and modes of management of cervical lymphadenopathy in children and adolescents and establish a definitive approach to the work-up and manage children-adolescents with cervical lymphadenopathy.

**Materials and methods:** A retrospective study was done over a six months period from May 2014 to October 2014. All patients presented with palpable cervical lymph nodes to the Department of Surgery, Rajiv Gandhi Medical College and Hospital were evaluated. Total of 70 cases below 12 years old were evaluated retrospectively.

**Results:** The right anterior triangle lymph node was enlarged in 30% cases, while the left anterior triangle lymph node alone was palpable in 21% cases and in 12% cases bilateral anterior triangle lymph nodes were palpable. The right posterior triangle lymph node was enlarged in 11% cases while it was 9% in left with only 5% in bilateral posterior triangles. 2% cases had generalized cervical lymphadenopathy. In 6% cases, submental and submandibular lymph nodes were enlarged while in 4% cases central group of lymph nodes were enlarged.

**Conclusion:** Cervical lymphadenitis is a symptomatic enlargement of the cervical lymph nodes while lymphadenopathy is mere enlargement of lymph nodes. Most of the cases are self-limited. They can be safely observed and monitored for spontaneous resolution over three to four weeks time. If there is no regression, or persistent/ aggravating symptoms further investigation and management [medical and/surgical] as per the protocol is to be initiated.

**Keywords:** Cervical lymphadenopathy, Children and adolescents, Public hospital, FNAC

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## INTRODUCTION

Cervical lymphadenopathy is usually defined as cervical lymph nodal tissue measuring more than 1 cm in diameter.<sup>1,2</sup> Lymphadenopathy refers to any disease process involving lymph nodes that are abnormal in size and consistency. This condition has multiple etiologies, the most common of which are neoplasia, autoimmune diseases, and infection. *Lymphadenitis* refers to lymphadenopathies that are due to inflammatory processes. It is characterized not only by nodal swelling, but also by pain, skin changes, fever, edema, and/or purulent collections. In the pediatric age group, most lymphadenopathies are attributable to an infectious etiology.<sup>3,4</sup>

Acute lymphadenitis develops over a few days, whereas subacute/chronic lymphadenitis develops over weeks to months.<sup>4</sup>

It is a common problem encountered in neck in children in outpatient department. The cause may range from non specific cervical lymphadenopathy to a malignant disease. With increasing number of cases of Koch, cervical lymphadenopathy due to Koch is always a possibility.<sup>4</sup>

In a typical outpatient pediatric clinic of a hospital in India, children with enlarged cervical, axillary or inguinal lymph nodes are a common

presentation. 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 disorder. Subacute or chronic lymphadenopathy is a manifestation of a number of diseases, such as tuberculosis, leprosy, mycoses, sarcoidosis, lymphoma and metastatic lymphadenopathy. With prevalence as high as 1.5%, tuberculosis is still rampant in this part of the world and the tuberculous involvement of lymph nodes is the most common form of extrapulmonary tuberculosis (responsible for 30-40% of cases).<sup>5,6</sup>

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 common causes of subacute or chronic lymphadenitis are mycobacterial infection, cat scratch disease, and toxoplasmosis.<sup>7</sup> Fine-needle aspiration cytology (FNAC) is an easy, rapid, economic and less invasive diagnostic modality for evaluating lymphadenitis. Diagnosis of tuberculosis in lymph nodes can be established by demonstrating acid-fast bacilli (AFB) in FNA smears with Ziehl-Neelsen stain or auramine-rhodamine stain, mycobacterial culture or through amplification of bacterial DNA by polymerase chain reaction (PCR). However, in India, being a developing country, the logistics (cost, equipment and time) involved in other techniques are too much; therefore, demonstration of AFB by Ziehl-Neelsen staining in FNAC smears is the most widely used technique.<sup>8,9</sup>

This study was conducted to observe various causes and modes of management of cervical lymphadenopathy in children

## MATERIALS AND METHODS

This was a retrospective study done over a six months period from May 2014 to October 2014. All patients presenting with palpable cervical lymph nodes to the Department of Surgery, Rajiv Gandhi Medical College and Hospital were evaluated. Total of 70 cases below 12 years old were evaluated retrospectively.

Following factors were analyzed.

1. Age, Sex

2. Location of the lymph node in neck
3. Duration of illness
4. Associated symptoms
5. Any past history
6. Previous treatment history
7. Clinical examination [local and systemic]
8. Investigations [Hematology; Radiology; Tissue sampling]
9. Treatment received
10. Complications

## RESULTS

There were 70 patients. All the patients had palpable cervical lymph nodes. 43 patients were female and 27 were male. The mean age of the patients was 6 years. The duration of illness was 1 month to 6 months in 50% [35] patients, 6 months to 1 year in 20% [14] patients, 1–2 years in 20% [14] patients and more than 2 years in 10% [7]. Clinically, a total of 140 lymph nodes were examined. The right anterior triangle lymph node was enlarged in 30% cases, while the left anterior triangle lymph node alone was palpable in 21% cases and in 12% cases bilateral anterior triangle lymph nodes were palpable. The right posterior triangle lymph node was enlarged in 11% cases while it was 9% in left with only 5% in bilateral posterior triangles. 2% cases had generalized cervical lymphadenopathy. In 6% cases, submental and submandibular lymph nodes were enlarged while in 4% cases central group of lymph nodes were enlarged. In 54% of patients, cervical lymphadenopathy was associated with infections like conjunctivitis, pharyngitis, upper respiratory tract infection, focal infections, tinea etc. Constitutional symptoms like loss of appetite, loss of weight, and evening rise of temperature were observed in 30% cases. In 8.5% cases, cervical lymphadenopathy was accompanied with axillary and groin lymphadenopathy. 7.1% cases had history of shortness of breath, night sweats and cough. 14.28% cases had family history while 8.5% cases have personal history of tuberculosis. 5.7% cases are already on anti tuberculosis treatment when they were brought for cervical lymphadenopathy. 30% cases are averagely build while nearly equal were poorly build. 20% nodes were tender on palpation

In 10% cases consistency was cystic with no sign of inflammation. 40% cases had Hb value of between 11-13gm%; 30% had between 9-11gm%; 30% had it below 9gm%. TLC was between normal range in nearly 80% cases whereas 20% had above normal range. ESR was raised in nearly 40% cases. Chest radiograph was taken in 40% cases suspected to be Koch and only 5.71% cases showed Koch lesion in it. USG of neck was done in nearly 40% cases. 2% cases had generalized cervical lymphadenopathy. 10% cases had cold abscess while 20% cases had matted nodes. FNAC revealed tuberculosis in 20%, lymphoma in 10% indeterminate in six (20%) of the patients. Biopsy was performed in 20% cases where the diagnosis of lymphoma was confirmed. 57.14% patients were treated as reactive adenitis. In 28.57% cases, AKT was started for tuberculosis. 10% patients were treated for lymphoma. Sinus formation was observed in 10% cases. Enlargement of the nodes with cystic change in consistency was seen in 20% cases [after AKT started] Nondependent cold abscess aspiration with AFB culture-sensitivity was done in such case.

## DISCUSSION

In children, enlarged cervical lymph nodes are more common.<sup>3</sup> As a part of reticuloendothelial system, lymph nodes serve as the transitional point for lymphatic vessels from which the lymph drain from most of the body part. Nodes with densely packed lymphocytes that organized loosely into cortical nodules and medullary cords through connective tissue, trabeculae and lymphatic sinuses. The juxtaposition of phagocytic cells, antigen presenting cells, and lymphocytes in area of sluggish blood flow is ideally suited to provide the first line of defense against pathogens.

Lymphadenopathy is mere enlargement of lymph nodes, and the causes are varied that may be inflammatory, degenerative or neoplastic.<sup>4</sup>

The complex array of lymph nodes of the head and neck defend against infection and considered in anatomic groupings based on lymphatic drainage. Cervical lymph nodes may reside in the anterior triangle forward of the sternocleidomastoid muscle, the posterior triangle behind

the sternocleidomastoid, the submandibular region below the jaw line. Submental enlargement and non-tender lymph node may suggest malignancy, especially when located in the posterior triangle. The possible cause lymphadenopathy by anatomic location and origin helps in management.

In 12 years, children cervical nodes upto 1cm in size may be palpable and may not signify any disease.<sup>5</sup> Cervical lymphadenopathy refers to cervical lymph nodal tissue measuring more than 1 cm in diameter.<sup>6,7</sup> Generalized lymphadenopathy, hepatosplenomegaly, and/or radiographic mediastinal lymphadenopathy suggest systemic illness.

Retrospective study is the present study in which 70 children were selected as a study group which are having palpable neck node as the selection criterion.

Various infections like Staphylococcal lymphadenitis,<sup>8</sup> viral respiratory infection, conjunctivitis, Streptococcal pharyngitis, focal infections, tinea etc. other causes are rubella, cat scratch fever,<sup>8</sup> infectious mononucleosis,<sup>9</sup> toxoplasmosis, brucellosis, Primary herpes simplex infection,<sup>8</sup> (primary herpetic gingivostomatitis, cytomegalovirus,<sup>8</sup> HIV infection,<sup>8</sup> histoplasmosis,<sup>10</sup> chicken pox.<sup>10</sup>

In malignant disease lymph node may become enlarged. This cervical lymphadenopathy may be reactive or metastatic.<sup>8</sup> Alternatively, enlarged lymph nodes may represent a primary malignancy of the lymphatic system itself, such as lymphoma (both Hodgkin's and non-Hodgkin's),<sup>11</sup> lymphocytic leukemia.<sup>8</sup> In lymphoma, multiple enlarged nodes are there which feel rubbery on palpation.<sup>12</sup>

Tuberculosis is one of common cause of cervical lymphadenopathy in children in India.<sup>13</sup> Other causes documented in various literatures include surgical trauma e.g. following a biopsy in the oral cavity,<sup>5</sup> Kawasaki disease,<sup>10</sup> sarcoidosis,<sup>8</sup> Lupus erythematosus,<sup>14</sup> various drugs (phenytoin and isoniazid), orofacial granulomatosis.<sup>15</sup>

There is limited evidence to suggest a single definitive approach to the work-up and treatment of a child with cervical lymphadenitis. A study of 19 cases of cervical lymphadenitis in children who were referred for surgical excision identified tenderness, bilateral lymphadenopathy, node size

smaller than 3 cm in diameter, lack of systemic symptoms, and fluctuating node size to be associated with a reactive process that did not require further treatment.<sup>16</sup>

### Role of Ultrasound-Neck

In children, Ultrasonography is non invasive method of cervical lymph node evaluation. It may be helpful in differentiation of cervical lymphadenopathy with different causes in children. Ultrasound findings along with clinical features can also be helpful to conclude a diagnosis.

In current study, tuberculosis was evident in any group of cervical lymph nodes, but most commonly involvement in posterior triangle group. Reactive adenitis was evident in all groups but more in anterior triangle. The lymphoma was observed in submandibular and posterior triangle. Similar findings were observed in other studies.<sup>17,18</sup> The affected lymph nodes site may provide idea to which pathology is affecting the nodes.

Ultrasound gives an idea to differentiate tuberculosis and malignancy [lymphoma and metastasis].

Benign lymph nodes have a significantly larger L/S [Long axis/short axis] ratio than did malignant nodes.<sup>19,20</sup> L/S ratio of <2 has a sensitivity of 85% and a specificity of 61% for malignancy.<sup>21</sup>

The most characteristic feature of tubercular cervical lymphadenopathy are strong internal echoes and echogenic thin layer.<sup>5</sup> The most characteristic feature of tubercular lymphadenopathy is Hypoechoic mass.<sup>22,23</sup>

Tuberculous nodes are predominantly hypoechoic which is commonly related to the intranodal cystic necrosis. Lymphoma nodes demonstrate intranodal reticulation, and the pseudocystic appearance appearance is less likely to be seen. The matting of the lymph nodes is common in tuberculous lymphadenitis, and is believed to be due to the periadenitis.<sup>17</sup> As matting of lymph nodes is common in tuberculosis, it is a useful feature in distinguishing tuberculosis from other diseases.<sup>25</sup> In tuberculosis, node borders are not sharp probably due to active inflammation of the surrounding soft tissues.<sup>17</sup> Lymphoma nodes tend to have sharp borders, whereas benign nodes usually do not have such sharp borders.<sup>26</sup>

### Role of FNAC

The important tools for the diagnosis of cervical lymph nodes is FNAC. Optimal material and experience makes diagnosis as correct as histopathology.<sup>27</sup> In one series, half the cases (50.4%) were reactive nonspecific. This is because in the cervical region most cases may be of acute lymphadenitis, due to infections of the oral cavity, nose and ears. Acute suppurative (12.4%); chronic granulomatous (10%); Tuberculosis (22.4%) were other important differential diagnostic patterns.<sup>28</sup>

Report of FNAC have 77% sensitivity in the detection of tubercular lymphadenopathy.<sup>30</sup> Sensitivity, specificity and diagnostic accuracy was reported to be 97%, 97.5% and 97.4% respectively in yet another study in which, cytomorphological features of epithelioid and giant cells with caseation necrosis was associated with higher percentage of AFB positivity.<sup>31</sup> The evaluation of patient in FNAC is considered with suspected recurrent lymphoma or deep seated primary lymphomas.<sup>32</sup> In bilateral Cervical lymphadenitis if the node size is smaller than 3cm and that is not erythematous should be observed without further treatment.

### Role of Culture

Culture of mycobacterium is diagnostic for mycobacterial cervical lymphadenitis. However, a negative culture result should not exclude the diagnosis of mycobacterial cervical lymphadenitis. The presence of 10–100 bacilli per cubic millimeter of the specimen is enough for a positive culture result. Different media can be used to culture the mycobacteria (L-J, Middlebrook, Bactec TB). However, several weeks are needed to obtain the culture result, which may prolong the initiation of treatment. Cultures are positive in 10–69% of the cases. Cervical lymphadenitis that is bilateral, with node size smaller than 3 cm, and that is not erythematous or exquisitely tender should be observed without further evaluation or treatment.

### CONCLUSION

Cervical lymphadenopathy in children is often

encountered in day to day clinical practice. The differential diagnosis is broad. Through history taking includes age, sex, duration of illness, any active or recent history of infection in head-neck region, past &/ family history of tuberculosis, constitutional symptoms and systemic symptoms. This along with thoughtful use of various diagnostic methods is important in narrowing the differential diagnosis. Although the underlying etiology is often self-limited infection, more serious underlying etiologies must be quickly recognized. Tuberculosis and malignancies are important considerations, as discussed.

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