



CLINICO-PATHOLOGICAL PROFILE OF SIGNIFICANT CERVICALLYMPHADENOPATHY IN PAEDIATRIC AGE GROUP (1MONTH-12 YEARS)

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ABSTRACT

Background: Nearly two-thirds of the lymph nodes are found in the neck region. The enlargement of cervical region lymph nodes is quite significant. Cervical lymphadenopathy is defined as an abnormal increase in the size of cervical lymph nodes more than 1cm in diameter. It may affect different age groups and the causative factors are different for each age group.

Aim & objective: To study the clinico-pathological correlation of cervical lymphadenopathy in pediatric patients of age group 1 month - 12 years and their presenting and etiological factors associated with it.

Methods- A hospital-based prospective study was conducted among children aged 1 month to 12 years attending VMKV Medical college and hospital, Salem. Blood examination for HB level, total and differential count, ESR, the peripheral smear was done by hematological techniques. Mantoux test was done in all patients as a part of routine workup. FNAC was done for all patients in the study group after selecting the most predominant node in patients with a source of infection. Swab was taken for culture and sensitivity.

Results- A total of 150 children participated. The mean (SD) age of the patients was (1.8) years and the majority of the children were female (57%). Swelling in the neck (93%), painful swelling (93%), fever (74%), and cough (55%) were the main symptoms presented by the children. Almost half of them had lymphadenopathy in the upper anterior cervical region (47%) and 30% had posterior cervical region. Staphylococci were the main organism found (53%) followed by streptococci (43%) in throat culture. Reactive hyperplasia was found in 80% of the cases with fine-needle aspiration cytology. Tuberculosis and suppurative were found in 10% and 6.7% respectively.



Conclusion- Swelling in the neck was the main symptom presented by the children. Almost half of them had a lymphadenopathy in the upper anterior cervical region, Staphylococci was the main organism found and reactive hyperplasia was found in 80% of the cases with fine-needle aspiration cytology.

KEYWORDS- Children, Etiology, Cervical lymphadenopathy, reactive hyperplasia

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INTRODUCTION

Lymph nodes are one of the most vital parts of the lymphatic system. They filter out all the non-essential foreign substances such as bacteria, viruses, etc., and eliminate them safely from the body. They are considered to be the filters of the lymphatic system. Nearly two-thirds of the lymph nodes are found in the neck region. [1]The enlargement of cervical region lymph nodes is quite significant. There are many etiological agents associated with it and it can lead to infection and malignancy all over the body. Acute infective lymphadenopathy usually gets treated with antibiotic therapy and only in case of abscess formation aspiration or drainage is required. [2]Enlargement of two or more non-contiguous lymph node regions is termed generalized lymphadenopathy. Systemic viral infections are the most important causes. Regional lymphadenopathy is defined as the enlargement of lymph nodes within contiguous anatomic regions.[3] The most common cause of regional lymphadenopathy is any sustained infection or inflammation process in the regions which are drained by the lymphatic nodes. The proper history and physical examination alone are sufficient to find out the cause of lymphadenopathy. Knowledge of the pattern of lymphatic drainage in the body helps in determining the etiology.[4]The most common regional lymphadenopathy is cervical and mainly due to systemic bacterial and viral infections. In pediatric patients, lymph node enlargement is very common and lymphadenopathy is a common clinical finding for pediatric doctors. In around 80-90% of children, cervical nodes are found to be palpable. It can be palpable at a very early stage of life.[5] The lymph nodes continue to change through puberty[6] Due to continued antigenic exposure they enlarge, grow and change in a considerate manner. The first line of defense against pathogens is provided by abundant phagocytic cells, antigen presenting cells, and lymphocytes. Because of this many children present with the complaint of a palpable mass in the neck region i.e. cervical lymph nodes. The etiological factor

may be normal physiological changes of a growing age or various upper respiratory tract benign infections which can be localized or generalized.[7] However, other causes include chronic infections, malignancy, and some autoimmune diseases. [8]The rationale of the present study was to describe various patterns of cervical lymphadenopathy associated with the demographic, pathological, and clinical profile of the patients coming to the out-patient department of hospitals. This would help the doctors to easily detect, treat and have a better therapeutic outcome and also guide doctors to decide which diagnostic test to opt for confirming the diagnosis. [9]It will also give a basic idea about the prevalence of various types of cervical lymphadenopathy in children. There are presently only a few studies in children showing the correlation in clinicopathological features of cervical lymphadenopathy. [10] The present prospective study aimed to delineate the clinicopathological correlation of cervical lymphadenopathy in pediatric patients of age group 1 month - 12 years and their presenting and etiological factors associated with it.

METHODOLOGY: This study was conducted among children aged 1 month to 12 years attending VMKV Medical college and hospital, Salem. The sample of the present study, were the selected children of age 1 month to 12 years who attended the pediatric OPD of VMKV medical college during 2018 and 2019. The sampling technique used for the present study was simple systematic random sampling. All alternate eligible patients were selected from the OPD. Inclusion criteria: Patients between the age group of 1 month to 12 years. Patients with cervical lymphadenopathy with lymph node size >1 cm in the cervical region. Lymph nodes were hard rubbery or matted. Lymph nodes with discharging sinus. Exclusion criteria: Patients with any of the following conditions. Recent hospitalization (Or) surgery (<4 months) A pretested semi-structured questionnaire was used to assess the sociodemographic and



behavioral characteristics. Patients' case records were reviewed to get the details of treatment history. Blood examination for HB level, total and differential count, ESR, the peripheral smear was done by hematological techniques. Mantoux test was done in all patients as a part of routine workup. FNAC was done for all patients in the study group after selecting the most predominant node in patients with a source of infection. Swab was taken for culture and sensitivity. Data collection started after obtaining approval from the research monitoring committee, and the institute ethics main committee (human studies). The data collection period was one year. The investigator introduced themselves and established a good rapport with the study participants/parents. The desire for conducting the study was explained to them. It was assured to them that all data would be kept strictly confidential and used only for the study purpose. After obtaining the written assent/consent from the participant/parent, the investigator interviewed collecting data. All the patients who visited pediatric OPD and were eligible for the study were included.

STATICAL ANALYSIS: The data were transferred into an excel sheet and analyzed by using STATA - version 14 and the data were

analyzed by using descriptive statistics and inferential statistics. Continuous variables such as age and duration of symptoms were summarized as mean (standard deviation). Categorical variables like gender, sex, area of residence, symptoms, site of lymphadenopathy in the cervical region, size of the lymph nodes, consistency of lymph nodes, mobility of lymph nodes, tenderness, associated findings, blood counts, presence of anemia, hematocrit values, throat culture, ear swab, scalp lesion culture, culture of pus aspirated from lymph nodes, fine needle aspiration cytology, Mantoux test findings, and Chest X-ray findings were summarized as percentages.

RESULTS

Analysis of data is a systematic process that involves summarization of the collected data, interpretation of data gathered through the application of statistical and logical techniques to describe and illustrate, condense and evaluate data. So, this chapter deals with the results and interpretation of the data collected from 150 study participants. Data analysis through descriptive and inferential statistics was done to achieve the objectives of the study.

TABLE 1. AGE DISTRIBUTION

Age group	N	%
1m-3yrs	55	36.7
4-6yrs	32	21.3
7-9yrs	33	22.0
10-12yrs	30	20.0
Total	150	100

Table :1 The mean (SD) age of the patients was 4.5 (1.8) years. There were 37% children in the age group 1 month to 3 years and 20% were above 10 years. Majority of the children were female (57%) and 43% were males.

TABLE 2. SYMPTOMS DISTRIBUTION

Symptoms	n	%
Swelling in neck	140	93.3

Painful swelling	140	93.3
Fever	111	74.0
Cough	82	54.7
Weight loss/Failure to gain weight	46	30.7
Loss of appetite	46	30.7
Sore throat	30	20.0
Ear discharge	11	7.3
Oriental pain	11	7.3
More than one symptom	140	93.3

Table:2 Swelling in the neck (93%), painful swelling (93%), fever (74%), and cough (55%) werethe main symptoms presented by the children.

TABLE 3 DURATION OF SWELLING

Swelling	N	%
< 1month	67	47.9
1m-6m	66	47.1
> 6m	17	5.0
Total	150	100

Table :3 almost half of the children have presented a swelling with a duration of <onemonth and 47% reported swelling for one to six months. Duration of fever reported by the patients is depicted in table 6. Most of the reportedhave a fever duration of less than one month and 43% had a fever more than one month. Duration of cough Three-fifths of them (59%) had a duration ofcough less than one month and the rest had one to six months.

TABLE 4. SITE OF LYMPHADENOPATHY IN CERVICAL REGION

Site	N	%
Posterior cervical	44	29.4
Submandibular	11	7.3
Upper anterior cervical	71	47.3
Supra clavicular	3	2.0
Occipital	14	9.3
Posterior auricular	7	4.7
Total	150	100

Table:4 Site of lymphadenopathy in the cervical region was shown in table 8. Almost half of themhad lymphadenopathy in the upper anterior cervical region (71%) and 30% had posteriorcervical region. The

size of lymphadenopathy shows that almost half (49%) had a size of two to four centimeters. The distribution of consistency of lymphadenopathy was depicted in table 10. Almost all were reported firm in consistency (93%).

Table 5. Mobility of lymphadenopathy

Mobility	N	%
Mobile / Discrete	130	86.7
Matted	20	13.3
Total	150	100

Table:5 Mobility of lymphadenopathy shows that the majority were mobile and discrete and 13.3% were matted. Almost all the patients presented with tenderness (88%). Staphylococci were the main organism found (53%) followed by streptococci (43%) in throat culture. Citrobacter was the main organism found (64%) followed by Pseudomonas (27%) in ear swab. Scalp lesion culture shows that there were 11 cases of Staphylococci and of them 2 cases with a positive culture. Sterile and staphylococci were found 62% and 37% in the culture of pus aspirated from lymph nodes. Reactive hyperplasia was found in 80% of the cases with fine-needle aspiration cytology. Tuberculosis and suppurative were found in 10% and 6.7% respectively. On the Mantoux test, 25% were positive and 75% were negative

TABLE 6 ASSOCIATED FINDINGS

Associated Findings	N	%
Tonsillitis and / orpharyngitis	19	12.7
Ear infection	11	7.3
Skin Lesions over the scalp	11	7.3
Orodental infections	31	20.7

Table:6 Associated findings of lymphadenopathy are depicted in table 14. One-fifth had or dental infections, 13% had tonsillitis or pharyngitis and 7% were reported ear infection/skin lesion over the scalp. Neutrophils (43%) were the main cells found in cell count, followed by leucocytes (37%), lymphocytes (24%), and eosinophils (7%). Distribution of ESR shows that almost one third had raised ESR.

DISCUSSION

This study attempted to determine the clinico-pathological profile of significant cervical lymphadenopathy among children of age 1 month to 12 years attending a pediatric OPD. Our study found that almost all the patients reported swelling or fever as a symptom.[11] In India a study found that symptoms such as drenching night sweat and weight loss were the most common symptoms among children. The majority reported the duration of symptoms was

less than one month. Patients typically presented with a history of fever, cough sore throat, earache, or swelling, as physical findings. Most of the children reported the upper anterior cervical region as a site of swelling in the cervical region. [12] In contrast to this study a study by Annam, et al. mentioned that the posterior group was the most commonly affected site. A study conducted by Chhabra found that the most common site of involvement of lymph nodes was the neck. The size of lymphadenopathy shows that almost half (49%) had a size of two to four



centimeters. Almost all were reported to be firm in consistency (93%). Mobility of lymphadenopathy shows that the majority were mobile and discrete and almost all the patients presented with tenderness (88%). These findings were similar to other studies conducted. [14] Neutrophils (43%) were the main cells found in cells, followed by leucocytes (37%), lymphocytes (24%), and eosinophils (7%). ESR shows that almost one-third had raised ESR. Also, in the present study participants, half had anemia.[15] Tara Rosenberg, Nolder et.al also reported that intake of oral cephalixin can cause some side effects such as hemolytic anemia, neutropenia, thrombocytopenia, and anaphylactoid/hypersensitivity reactions. In the current study, Staphylococci was the main organism found (53%) followed by streptococci (43%) in throat culture. Citrobacter was the main organism found (64%) followed by Pseudomonas (27%) in-ear swab. Sterile and staphylococci were found 62% and 37% in the culture of pus aspirated from lymph nodes. Large (>2-3 cm) unilateral acute cervical lymph node enlargement in children is commonly due to bacterial infection.[16] A study from Eastern Virginia Medical School, Norfolk, USA found that 40% to 80% of cases of cervical lymphadenitis in under-five children are due to Staphylococcus aureus or Streptococcus pyogenes. Bacteroides sp, Propionibacterium acnes, Peptococcus sp, Fusobacterium nucleatum, and Peptostreptococcus sp. were found in the older children with dental caries or periodontal disease as anaerobic bacteria. Initial antibiotic therapy is most commonly prescribed at the most likely organisms. As streptococci and staphylococci are the most common pathogens, the therapy usually includes a β -lactamase resistant antibiotic.[17] This therapy is used because of the high chance of penicillin resistance in isolated staphylococci In the present study, one-fifth had dental infections, 13% had tonsilitis or pharyngitis and 7% were reported to have ear infection/skin lesion over the scalp. If a primary site is identified, cultures should be obtained and treatment is directed at that site as well [18]. Reactive hyperplasia was found in 80% of the cases with fine-needle aspiration cytology. Tuberculosis and suppurative were found in 10% and 6.7% respectively. [19] Friedmann AM et al. conducted a prospective study on 121 cases of cervical tuberculous lymphadenitis also

reported TB as the common cause of peripheral lymphadenitis in developing countries. Considering that the secondary metastasis of lymph nodes might be the etiology it has to be predicted as per the anatomical basis of lymphatic drainage and the findings are more important. In the current study, on the Mantoux test, 25% were found positive. In lymphadenitis for accurate diagnosis, correct staging and treatment are important for the best outcome. USG or Mantoux test was the established method for the assessment of cervical lymphadenopathy. Plain radiography was noncontributory. On grayscale normal USG, lymphomatous nodes tend to be round, with well-defined borders, and are usually without an echogenic hilus. The commonly observed lymphomatous nodes were Intranodal reticulation (micronodular echo pattern) and seldom shows cystic necrosis.[20]

CONCLUSION

A total of 150 children participated in the study. The response rate was 100%. Swelling in the neck was the main symptom presented by the children. Almost half of them had a lymphadenopathy in the upper anterior cervical region, Staphylococci was the main organism found and reactive hyperplasia was found in 80% of the cases with fine-needle aspiration cytology. This finding opens our eyes broader since there is an alarmingly high prevalence of lymphadenopathy among children. Screening programs to identify such cases at an early stage is a need of the hour. Interventions to educate the patients regarding the importance of checking the presence of pathogens is important.

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