

FNAC Profile of Lymphadenopathy in Children

Dr. S. Vasuki.^{Md(Path)1}, Dr. K. Swaminathan,^{Md(Path)2.}

V.S.Lavanya³.

¹Associate Professor in Pathology. Tirunelveli Medical College. Tirunelveli.

²Professor in Pathology. Tirunelveli Medical College. Tirunelveli.

³MBBS student. Tirunelveli Medical College. Tirunelveli.

Abstract: Lymph node enlargement is a common clinical finding in pediatric practice. It may represent normal age related physiological changes or transient response to various benign local or generalized infections. The aetiological profile varies. In developing countries like India, acute respiratory infections, suppurative skin infections and tuberculosis are the major causes for regional lymphadenopathy. The present study is undertaken to evaluate the clinical profile of significant lymphadenopathy in childhood with special reference to evaluate the role of FNAC profile in etiological work up. The study included 50 consecutive paediatric patients with significant lymphadenopathy. In-patients and outpatient cases visiting the departments in Tirunelveli Medical College Hospital were studied with Fine needle aspiration study and the results analysed. FNAC's sensitivity and specificity as compared against the 'gold' standard of excision biopsy was 94% and 100% respectively. From the 50 positive cases from whom FNAC was done, results showed that 48% cases had reactive lymphadenitis; 36% cases had granulomatous lymphadenitis of which 72% were non-caseating and 28% were caseating granulomatous lymphadenitis; 8% had suppurative lymphadenitis; 4% had tubercular lymphadenitis; and 4% were Hodgkin's lymphoma. We conclude that FNAC of enlarged lymph nodes in children is a safe, reliable (accuracy, 98%) diagnostic procedure that often obviates the need for an excisional biopsy.

Keywords: biopsy- fine needle, lymphadenopathy, pediatrics.

I. Introduction

Lymph node enlargement is a common clinical finding in pediatric practice. The lymphatic system is part of the immune system and functions to fight disease and infections. As infection-fighting cells and fluid accumulate, the lymph nodes enlarge to many times their normal size. It may represent normal age related physiological changes or transient response to various benign local or generalized infections originating from the upper respiratory tract or skin¹. However, it may also herald chronic infections like tuberculosis, brucellosis and serious conditions like malignancies and autoimmune disorders or other rare causes like atypical mycobacterial lymphadenitis, SLE, brucellosis or histiocytosis^{2,3}. The aetiological profile varies from country to country and region to region. In developing countries like India, acute respiratory infections, suppurative skin infections and tuberculosis are the major causes for regional lymphadenopathy⁴. It has been stated that any significantly lymph node enlargement not subsiding or remaining static in size for more than two weeks after conventional antibiotics needs to be thoroughly investigated⁵.

Since enlarged lymph nodes are often localized near the source of infection, their location can help determine the cause. For example, an infant with a scalp infection may have enlarged lymph nodes at the back of the neck. Swollen lymph nodes around the jaw may be due to an infection in the teeth or mouth. However, the lymphadenopathy may be generalized, with lymph node enlargement in more than one area (typical of a viral illness). Lymph nodes can also enlarge due to cancer in the lymphatic system such as Hodgkin's lymphoma or non-Hodgkin's lymphoma. The common symptoms of lymphadenopathy are,

- swollen, enlarged lumps in the neck, back of the head, or other locations of lymph nodes
- tenderness of the nodes, although the nodes may not be painful if the child is no longer ill
- warmth or redness of the skin over the lymph nodes
- fever.

The present study is undertaken to evaluate the clinical profile of significant lymphadenopathy in childhood with special reference to evaluate the role of FNAC profile in etiological work up.

II. Aims and Objectives

The aim of this retrospective study is to determine the utility of FNAC in diagnosing pediatric lymphadenopathy and to study the cyto-pathological profile of significant pediatric peripheral lymphadenopathy.

III. Inclusion Criteria

Children of either sex of age 01 month to 12 years with localized or generalized lymphoid swelling in any region and diagnosed as suffering from lymphadenopathy are included in the study.

IV. Exclusion Criteria

Children on empirical/specific therapy for lymphadenopathy for more than two months are excluded from the study.

V. Sample

Using a 10 ml syringe with 22 or 25 gauge needle aspirate was taken from multiple sites of a lesion. The aspirate is immediately smeared on to a glass slide and fixed in isopropyl alcohol for 20 minutes and then stained with Hematoxylin & Eosin stain.

VI. Materials and Methods

The study will include 50 consecutive patients with significant lymphadenopathy aged one month to twelve years formed the study material. In patients and outpatient cases visiting the departments in Tirunelveli Medical College Hospital formed the sample for the study. The study period extended from August 2013 to September 2013.

Significant peripheral lymphadenopathy for the purpose of study constituted (i) Lymph nodes in the cervical & axillary region >1cm, inguinal region >1.5cm and any other site of >0.5cm size, (ii) Matted/Fixed lymph nodes, (iii) Lymph nodes which were hard rubbery on palpation & (iv) Lymph nodes with a discharging sinus⁷. Children on empirical/specific therapy for lymphadenopathy for more than 2 months and children with abdominal and mediastinal lymphadenopathy were excluded from this study⁸. A detailed history was taken in all cases and a thorough general physical examination (including that of skin and tonsillopharyngeal region) and systemic examination carried out in all cases was done as per a prepared proforma. Written consent will be taken from the parents/guardian of the children explaining the procedure, its risks and benefits.

Sample collection: Using a 10 ml syringe with 22 or 25 gauge needle aspirate was taken from multiple sites of a lesion. The aspirate is immediately smeared on to a glass slide and fixed in isopropyl alcohol for 20 minutes and then stained with Hematoxylin & Eosin stain. Reactive hyperplasia on lymph node FNAC and or biopsy which could not be assigned any specific aetiology even after thorough clinical and investigative profile was termed as non-diagnostic hyperplasia¹¹. The data were subjected to analysis and conclusions drawn.

VII. Result

In the present study in 50 cases, maximum children (20 cases) were in the age group of 10-12 years followed by 2-5 years (12 cases), 6-9 years (10 cases) and less than one year (8 cases)(Ref. tab-2) ; female preponderance was noted in all the age groups except in the category of less than 1 year(Ref tab-1). The most common symptom noted was swelling in the neck followed by fever in nearly 78% of cases and others (12% cases) developed only tenderness, redness and pain in that region. In 42% cases there was more than one presenting symptom. Most of the patients had duration of symptoms for more than one month but less than 6 months as observed in 71% cases with neck swelling and 88% with failure to gain weight or loss of weight even though fever was present in majority of the cases (76%) for less than a month. Regional lymphadenopathy was present in all cases out of which 76% were in cervical region (most of it involving posterior cervical group-65%, followed by submandibular region (8%); other regions like posterior auricular, axilla, occipital and inguinal region constituted 6%,6%,2% & 2% respectively (Ref tab-3). Clinical signs at presentation included presence of malnutrition in almost all cases. Lymph nodes were non-tender in 30% of cases and almost all of them were firm (95%) in consistency. FNAC's sensitivity and specificity as compared against the 'gold' standard of excision biopsy was 94% and 100% respectively. FNAC in some cases was too tiny to aspirate and presented with swelling on neck and that was later diagnosed by clinical examination as ganglion swelling or thyroglossal cyst or some other conditions were not included in the study. And from the 50 positive cases taken, 48% cases had reactive lymphadenitis; 36% cases had granulomatous lymphadenitis of which 72% were non-caseating and 28% were caseating granulomatous lymphadenitis; 8% had suppurative lymphadenitis; 4% had tubercular lymphadenitis; and 4% were Hodgkin's lymphoma(Ref tab-4).

VIII. Discussion

In the present retrospective study of pediatric lymphadenopathy, it is observed that nearly 50% children (24 cases) were Reactive lymphadenitis. Reactive lymphadenitis describes a condition where there is enlargement of the lymph nodes in response to infections. Bacterial and viral infections are the leading causes of reactive lymphadenopathy. Swollen lymph nodes due to infections are often painful. Localized infection usually

affects the lymph nodes that are closest to the abnormality. The lymph nodes decrease in size and are less painful as the infection is treated. Next it is followed by granulomatous lymphadenitis (18 cases) which can be either caseating (13 cases) or non-caseating (5 cases). Granulomatous reactions could be infectious caused mainly by bacteria, Mycobacteria, spirochetes, fungi, arasites and viruses. Non-infectious specific patterns are seen in sarcoidosis, collagen vascular diseases, silicosis, and dermatopathic lymphadenopathy. Granulomata are recognized ytologically by observing aggregates of histiocytes with, and without, associated multinucleated giant cells. A dirty necrotic background will suggest caseation and possibly tuberculosis. In cases where an infective aetiology was thought likely, further investigations re needed. And 2 cases were found to have Hodgkin’s lymphoma which is characterized by the orderly spread of disease from one lymph node group to another and by the development of systemic symptoms with advanced disease. When Hodgkin’s cells are examined microscopically, multinucleated Reed-Sternberg cells are the characteristic histopathologic finding.

Thus it is possible to arrive at a clinical diagnosis in examining the cytological profile of aspirates obtained from fine needle aspiration technique. It provides quick diagnosis and is also time saving and economical. Some malignant conditions like lymphomas can be detected earlier and it is possible to provide earlier treatment and progression of diseases can be stopped at an initial stage itself.

In our hospital, majority of cases reported were reactive lymphadenitis. But in other studies conducted in other low socio economic states like Uttar Pradesh which was conducted in the year 1998, tubercular lymphadenitis was predominantly presented⁹. But now in present days, with development of BCG vaccinations, easy exposure of the people to government hospitals and other precautionary measures, cases of tubercular lymphadenitis are greatly reduced in numbers. BCG scar was noted in all cases. Now a days, only benign condition like reactive hyperplasia is only present which is not a serious one and it will spontaneously regress when the underlying infectious condition is treated. The majority of the cases of reactive lymphadenopathy in children are benign and self limiting¹⁰.

IX. Conclusion

FNAC is a useful, minimally invasive first line investigation to evaluate lymphadenopathy. An early diagnosis on FNA allows clinicians to plan and institute ppropriate treatment in most cases. Lymph node fine needle aspiration cytology is valuable in solving the diagnostic problems of clinical adenopathy. Fine needle aspiration of enlarged lymph nodes in children is a safe, reliable (accuracy, 98%) procedure that often obviates the need for an excisional biopsy.

Tab-1. Distribution Among Both Sexes

SEX	NO. OF CASES
Male	21
Female	29
Total	50

Tab-2. Ditrubition On Different Age Groups

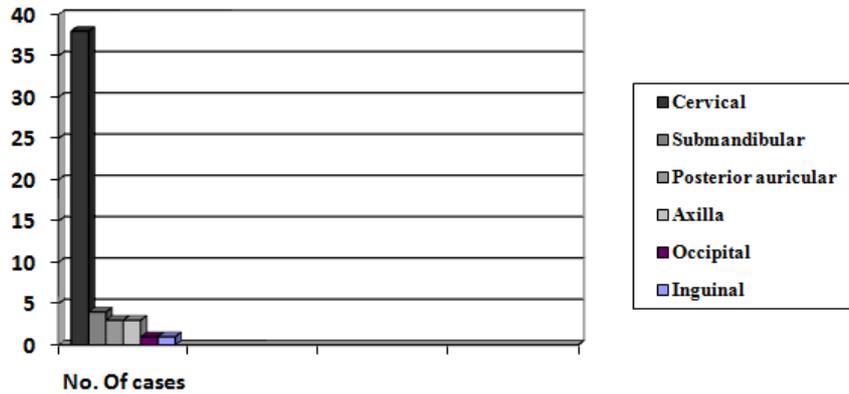
Age group	Male	Female	Total
Less than 1 year	5	3	8
2-5 years	5	7	12
6-9 years	3	7	10
10-12 years	8	12	20
Total	21	29	50

Tab-3. Distribution of Lymph Node Swelling on Different Sites

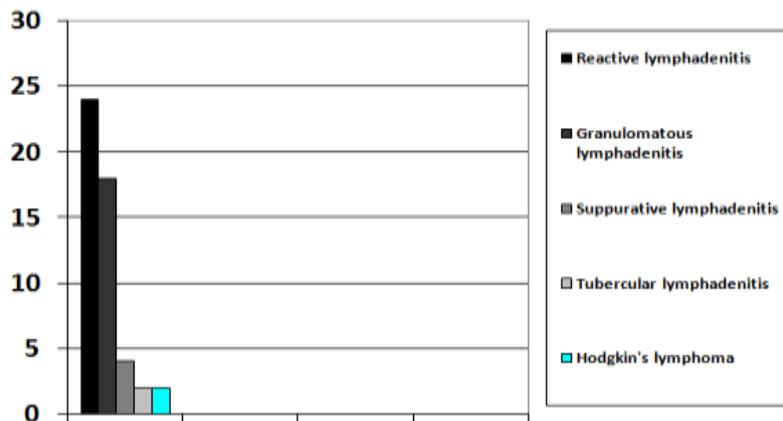
Site	No. of cases
Cervical	38
Submandibular	4
Posterior auricular	3
Axilla	3
Occipital	1
Inguinal	1
Total	50

Tab-4. Histopathological Examination

Histopathological findings	No. of cases
1.Reactive lymphadenitis	24
2.Granulomatous lymphadenitis	18
a. Caseating	13
b. Non-caseating	5
3.Supplicative lymphadenitis	4
4.Tubercular lymphadenitis	2
5.Hodgkin's lymphoma	2
Total	50



The above chart shows the site of distribution of lymph node swelling and from where the aspirate is taken. In this site of lymph node swelling is taken in the X-axis and no. of cases is taken in the Y-axis.



The above chart shows the histopathological findings in the FNAC examination. Here, histopathological findings is taken in X-axis and no. of cases is taken in Y-axis.

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