



FINE NEEDLE ASPIRATION CYTOLOGY IN EVALUATING CERVICAL LYMPHADENOPATHY IN PAEDIATRIC AGE GROUP (0-14YEARS) - A HOSPITAL BASED STUDY.

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ABSTRACT **Background:** Cervical lymphadenopathy is one of the commonest presentations in children. Fine Needle Aspiration Cytology (FNAC) is a simple, rapid, inexpensive and minimally invasive technique used for establishing the etiology of cervical lymphadenopathy with ease and accuracy. In this study, we evaluate children ≤ 14 years who present with cervical lymphadenopathy with this simple technique to know the etiological distribution and its correlation with other clinical parameter. **Aims & Objectives:** (1) To assess the distribution of various cytomorphological patterns of cervical lymphadenopathy in paediatric age group; (2) To assess the age specific distribution of various cytomorphological patterns of cervical lymphadenopathy. **Materials and Methods:** This study was carried out at Fakhruddin Ali Ahmed Medical College, Barpeta. Assam on 81 clinically diagnosed cases of cervical lymphadenopathy over a period of extending from November 2019 to May 2020. Fine Needle Aspiration Diagnosis was correlated with details of relevant clinical findings and investigations. **Results:** Total 81 cases were studied, out of these 36 (44.45%) were found to be reactive lymphadenitis which was the most common finding followed by tubercular lymphadenitis 24 (29.63%). Out of 81 cases, 6 were diagnosed as Lymphoma. Highest incidence of cervical lymphadenopathy was found in patients of 9-14 years age group. **Conclusion:** Fine Needle Aspiration Cytology is easy, simple, safe, reliable and non-invasive procedure for diagnosis of cervical lymphadenopathy.

KEYWORDS : Lymphadenopathy, Fine needle aspiration cytology.

INTRODUCTION

Lymphadenopathy is a common problem in children [1,2]. Evaluation of a child with lymphadenopathy is a common clinical scenario for the pediatricians [2]. The lymph nodes are a part of reticuloendothelial system that houses a number of phagocytic cells, antigen presenting cells and large number of lymphocytes that provide the first line of defense for pathogens. Since lymph nodes are major organ of adaptive immunity their enlargement is a frequent presentation early in life in whom it starts to develop.

Lymphadenopathy in children being a cause for alarm to parents and its propensity to pose as indicator to underlying diseases varying from the most insignificant of the spectra to the most alarming has been the reason for it been evaluated with utmost urgency by pediatricians. Persistent enlargement of the lymph node necessitates detailed investigations to reveal an underlying pathology [3]. This very fact also requires a diagnostic tool that would provide quick, easy, simple and reliable results that would further management.

Aspiration of lymph nodes for diagnostic purpose was first reported in 1904 by Grieg and Gray in the diagnosis of Trypanosomiasis [4-6]. In 1921, Guthrie attempted to correlate lymph node aspiration cytology with various disease processes [4,6].

In the last few years, FNAC has emerged as a reliable diagnostic procedure in the pediatric age group, thus obviating the need for excision biopsy [7,8].

The present study was carried out to know the spectrum of various diseases responsible for cervical lymphadenopathy in the paediatric age group of the region of Assam by FNAC.

Materials and method :

We conducted this study in the Department of Pathology, F.A.A Medical College, Barpeta, Assam. This included a prospective analysis during the period November 2019 to May 2020. Total number of cases of lymphadenopathy in the paediatric age group (≤ 14 years) during the study period were 81. All the cases fulfilling the following criteria were included in the study:

Age ≤ 14 years.

Cervical Lymph node enlargement with diameter exceeding 1cm. Following exclusion criteria were applied:

Un-cooperative child.

Overlying skin showing acute inflammatory changes.

A detailed history was obtained and a thorough general physical examination and systemic examination carried out in all cases. Relevant investigations were performed when required based on the probable clinical diagnosis. The cases with neoplastic changes in cytomorphology were subjected to further histopathological study. The granulomatous lesions where etiology could not be established were also subjected to histopathological study. FNA was performed using disposable syringe (10 mL) and 21- or 22-gauge needle. The aspirate was ejected onto glass slides, and smears were spread evenly. Multiple smears were prepared simultaneously. Wet-fixed smears in absolute alcohol were stained by Papanicolaou stains, and air-dried smears were stained with May-Grünwald-Giemsa (MGG) stain. Ziehl-Neelsen stain for TB were used in selected cases. Histopathologic study of biopsies was done in cases when indicated.

Results :

This study has been done in 81 children in the age group of 0-14 years. 86 children in the age bracket were initially subjected to FNAC for cervical lymphadenopathy. Among these patients, in 5 cases, the aspirate was inadequate despite repeated endeavours and hence these cases were excluded from the study.

There were 45 males and 36 females in the study (Table 1). Male: female ratio in this study was 1.25 :1, with a slight male preponderance. The age at presentation ranged from 2.5 yrs to 14 years. The children were grouped under 0-4 yrs, 5-8 yrs and 9-14 yrs. Maximum number of patients were in the age group of 9-14 yrs (48 cases, 59.26 %) followed by the age group 5-8 yrs (21 cases, 25.93%) and 0-4 yrs (12 cases, 14.81%).

In our study, most of the lymph nodes were from the submandibular group with 42 cases (45.16%) followed by posterior cervical group of 28 cases (30.10%) respectively (Table 3).

On the basis of cytomorphology, cause of lymphadenopathy was classified broadly into Non-neoplastic and Neoplastic (Table 4 & 5). There were 74 cases (91.35%) in Non-neoplastic category and 7 cases (8.65%) in Neoplastic category.

Reactive lymphadenitis constituted the maximum cause of adenopathy

(36 cases, 44.45 %) in the non-neoplastic group. The cytological features which helped to clinch the diagnosis were cellular smears, polymorphous lymphoid cell population and presence of lymphohistiocytic tangles. Tubercular lymphadenitis cases were identified based on the presence of collection of epithelioid cells with or without necrosis. A total of 24 cases, 29.63% of tubercular lymphadenitis were identified in this age group. ZN staining was advised in all 24 cases of granulomatous lymphadenitis. Eleven cases were positive for acid fast bacilli (AFB) and were reported as tubercular lymphadenitis.

A total of 7 malignancies were identified during this study period. These cases were classified as: 4 Cases of Non- Hodgkin's lymphoma (NHL), 2 cases of Hodgkin's Lymphoma (HL) and one case of metastatic myeloid leukemic to lymph node.

All the four cases of NHL were identified under the age group of 6 yrs. All cases of lymphomas diagnosed on cytology were advised excision biopsy of the lymph nodes for histopathological confirmation of diagnosis. These cases were further advised immune-histochemistry (IHC) for characterization of lymphomas. Two cases of HL were identified in 5 years and 9 years of age. The cytological features of HL consisted of scattered typical Reed-Sternberg cells, atypical mononuclear cells in a background of reactive lymphocytes, eosinophils, plasma cells and histiocytes . The metastatic patient who was 4 yrs of age revealed large myeloid precursor cells with prominent nucleoli in a background of polymorphous population of lymphoid cells in the aspirate from the supraclavicular node. The peripheral blood smear of the patient was studied and revealed acute myelogenous leukemic.

Table 1:sex-distribution

Sex	No of Cases	Percentage(%)
Male	45	55.55
Female	36	44.45
TOTAL	81	100

Table 2 : Age Distribution In Different

Age group in yrs	Reactive	T.B	Suppurative	Lymphoma	Secondaries	Histiocytosis	Total	Percentage(%)
0-4	6	1	1	2	1	0	12	14.81
5-8	8	7	4	3	0	0	23	28.39
9-14	22	16	4	1	0	1	46	56.80
TOTAL	36	24	9	6	1	1	81	100

Table 3 : Lymph Node Group Most Commonly Involved In Tuberculosis, Reactive And Lymphoma

Sl. No	L.N group	No of cases of tuberculosis	No of cases of reactive	No of cases of lymphoma
1	Submandibular	9	13	3
3	Posterior cervical	14	11	-
2	Submental	-	2	-
4	Preauricular	1	3	-
5	Anterior cervical	-	7	2
6	Supraclavicular	-	-	1

Table 4: Distribution of Non-neoplastic and Neoplastic cases

Sl No	Nature Of Lesions	No Of Cases	Percentage (%)
1	Non-neoplastic	74	91.35
2	Neoplastic cases	7	8.65

Table 5: Pattern Of Cytomorphological Diagnosis

Sl No	Nature of lesion	No of cases	Percentage (%)
1	Acute inflammation	9	11.11
2	Granulomatous ymphadenitis	4	4.94
3	Reactive	36	44.45
4	Tubercular lymphadenitis	24	29.63
5	Lymphoma	6	7.41
6	Secondary deposit	1	1.23
7	Histiocytosis	1	1.23
8	TOTAL	81	100

DISCUSSION:

A total of 81 cases of superficial lymph nodes were sampled during the study period. Analysis showed that male patients predominated over

female patients with a male female ratio of 1.25:1. Male preponderance was also seen in study done by Reddy et al [9], Ahmad et al[10] and Hirachand et al [11], Singh et al (2016) [12]. However study done by Khan et al [13] showed a female preponderance with male: female ratio of 1:1.22.

The cause of male over female preponderance could not be ascertained but could be linked to the social fabric of our society.

The majority of children in the present study belonged to the school-going age-group of 9–14 years (56.80%). Similar results have been reported by Annam et al [14]. The majority of children presenting with significant cervical lymphadenopathy in previous studies were in the preschool age-group of 4–8 years[15,16,17]. However, Knight et al[18] emphasized in one of the largest studies relating age to lymphadenopathy that age is not important in predicting the incidence of cervical lymphadenopathy. The variation found in our study could be due to the fact that most cases of lymphadenopathy with a size less than 1cm were excluded from the study. Also the wait and watch protocol followed in these rural parts of our country made most of reactive nodes to resolve on their own without much intervention.

Majority of cases in our study were benign, 91.35 % and 8.35% being malignant . This finding correlates well with findings of Ahmad et al[10] who have reported 86.4% benign and 13.6% malignant cases. Similar finding has been reported by other studies as well[19-21] . However, study by Hirachand et al [11] has reported a distinct increase in malignant cases with 81.5% benign and 18.5% as malignant.

Our study shows 44.45 % cases of adenopathy to be due to reactive lymphadenitis and 29.63% as tubercular lymphadenitis. Ahmad et al [10] has found 53.6% cases being reactive and 32.8% cases being of tubercular nature and reports of study by Balaji et al [22] shows 59.25% reactive lymphadenitis and 39.07 % of tubercular lymphadenitis of the total cases. Study by Hirachand et al [11] also showed that reactive lymphadenitis was the most common cause of lymphadenitis (41.55%) followed by tubercular lymphadenitis (28%). So, our study is in keeping with the above studies. However a study by Singh et al[12] has revealed reactive to be the cause of lymphadenopathy in 71.05% cases and tubercular lymphadenitis being 17.11% of the total cases.

All granulomatous lymphadenitis cases were worked up for AFB (Ziehl-Neelson (ZN) staining). Our study showed AFB positivity in 11(39.28%) cases of granulomatous lymphadenitis. Balaji et al[22] reported AFB positivity as 32.5% and Ahmad et al[10] reported 46.4%. But a study by Paliwal Nidhi et al [23] shows incidence of tuberculous lymphadenitis as 55% with Overall AFB positivity as 71.0%. The other cases were followed with histopathology that confirmed the diagnosis of tubercular etiology from morphology. In 4 cases out of 28 cases of granulomatous lymphadenitis, no definitive tubercular etiology could be established which were reported as granulomatous lymphadenitis (4.94%).

Only 8.65 % malignancies were identified in our age group with Non Hodgkins lymphoma being the most common 57.14% (4 out of 7 cases) followed by Hodgkin's Lymphoma 28.57% (2 out of 7 cases) and 14.28% of metastatic (1 out of 7 cases). Cytologic criteria for non-Hodgkin's lymphoma were based on monomorphism and macronucleoli, whereas criteria for Hodgkin's lymphoma consisted of polymorphism, including immature lymphocytes, eosinophils and Reed-Sternberg cells[24].

Other studies involving children with lymphadenopathy where similar incidence of neoplastic lesions was seen along with predominance of lymphomas were done by Bhandari B and Jain et al [25] Annam V et al [14], Hussain M et al [26] and Ponder TB [27].

All the cases of Lymphoma were found to occur in the age in children under 10 years of age years. Mishra et al [28] observed that primary neoplasm of the lymph node was most common under 12 years of age. However Balaji et al [22] has reported primary malignancy of lymph node to have occurred in children in 4-6 years of age. The cases of tuberculosis in our study were found to be in the age group of 9-14 years. Balaji et al reported tuberculosis to occur most commonly in 7-12 years age group .Singh et al [12] also found tuberculous lymphadenitis to occur most frequently in 10-16 years age group.

Reactive cases were found to be more frequent in the age group of 9-14 years 58.33%. Most studies however report reactive in the younger age bracket. The reason for this variation could probably be the same as that for the majority of the study population being in the same age group.

The present study shows that the submandibular group (45.16%) of lymph node was the commonest involved group in overall cases, in reactive cases and in neoplastic cases but in cases of tuberculosis the posterior cervical group of lymph node was the commonest to be involved followed by submandibular. Preponderance of posterior triangle cervical node involvement in tubercular cases was also reported by Haque et al [29], Annam et al [14] and Reddy et al [9].

In cases of malignancy, study by Balaji et al [22] has shown that posterior cervical group of nodes are most common to be involved in malignancy which was supported by study done by Khan. et al [13]. But our study shows submandibular gland being the most commonly involved group. However considering the small number of neoplastic lesion included in the study, these findings cannot be considered conclusive.

Based on our study we feel that FNAC of palpable cervical lymph nodes as a first line of investigation is a cost-effective procedure and is not only useful in the diagnosis of various lesions but can also help in deciding on appropriate management. FNAC emerged as a safe and reliable diagnostic procedure in paediatric age group obviating the need for excision biopsy.

CONCLUSION:

From our study it can be safely concluded that fine needle aspiration cytology as a means of evaluating cervical lymphadenopathy is of immense usefulness due its ease, cost effectiveness combined with its fair degree of accuracy in establishing the cause of adenopathy. Its property of being minimally invasive and safety makes it an ideal investigative procedure in children. It has scope for repeatability in selected cases of clinically highly suspicious lesions where initial result is proved inconclusive.

It has proved to be a useful first line investigation for diagnosing both non neoplastic and neoplastic lesions.

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