



ISSN: 0976-3376

Available Online at <http://www.journalajst.com>

ASIAN JOURNAL OF
SCIENCE AND TECHNOLOGY

Asian Journal of Science and Technology
Vol. 08, Issue, 03, pp.4419-4422, March, 2017

RESEARCH ARTICLE

ROLE OF CYTOMORPHOLOGICAL STUDY OF CERVICAL LYMPHADENOPATHY IN PAEDIATRIC AGE GROUP IN HAPUR REGION (U.P.) INDIA

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ARTICLE INFO

Article History:

Received 26th December, 2016

Received in revised form

10th January, 2017

Accepted 17th February, 2017

Published online 31st March, 2017

Key words:

Cervical lymphadenopathy,
Fine needle aspiration cytology
(FNAC),
Granulomatous lymphadenitis.

ABSTRACT

Background: The lymph nodes are an essential part of the body's immune system and as such are affected in many infections, autoimmune, metabolic and malignant diseases. The cervical region lymph nodes are particularly important because they are the first drainage site from key point of contact (mouth/eyes/ears/respiratory system) and can represent an early clinical sign in their exposed position on a child's slim neck.

Aims and Objectives: a) To evaluate the role of fine needle aspiration cytology in cervical lymphadenopathy in pediatric age group. b) To study the cytopathological profile of children from Rural India (Hapur) in cervical lymphadenopathy.

Materials and Methods: A prospective study was conducted from February 2015 to June 2016. Fine Needle Aspiration Diagnosis was correlated with detail of relevant clinical findings and investigation. A total of 150 patients were subjected to FNAC of cervical lymph node lesions. FNAC was performed using 22/ 23 gauge needle attached to 10 ml plastic disposable syringe.

Results: In this study 150 patients were subjected to FNAC for cervical lymphadenopathy. The male: female ratio in this study was 1.21:1, with a slight male preponderance. Maximum number of patients were in the 13 – 18 years age group (59 cases, 39.33%) followed by the age group 1 month – 6 years (46 cases, 30.67%) age group.

Conclusion: Our study concluded that FNAC is simple, quick, minimally invasive, and inexpensive technique to diagnose cervical lymphadenopathy. It can differentiate a neoplastic from a nonneoplastic process and therefore influence patient management preventing patient from being subjected to unnecessary surgery.

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INTRODUCTION

Cervical lymphadenopathy is usually defined as cervical lymph node measuring more than 1 cm in diameter. Acute lymphadenopathy is 2 weeks duration, sub-acute is 2-6 weeks duration, and chronic is more than 6 weeks (Jackson and Chesney, 2012). The pattern of lymph node enlargement varies in different age group. In children, the most common site is cervical (54%), followed by mesenteric (22%), axillary (13%) and inguinal (10%). It may herald chronic infections like tuberculosis, brucellosis and serious conditions like malignancies and auto-immune disorders. In developing countries like India, acute respiratory tract

infections, suppurative infections and tuberculosis are the major causes for regional lymphadenopathy (Lambert Skoog and EhneiaTani).

MATERIALS AND METHODS

This retrospective study was conducted from February 2015 to June 2016 in Cytopathology section of Department of Pathology, Saraswathi Institute of Medical Science and Hospital, Hapur (Uttar Pradesh). After approval of the institutional ethical committee(IEC), an informed consent was taken from parents of children presented to the hospital. The children(age group 1 month-18 years) presenting with enlarged cervical lymph nodes coming to pediatric department was included in the study.

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Inclusion criteria

- Patients between the age group of 1 month to 18 years with cervical lymphadenopathy.
- Cases with representative and adequate cellularity.

Exclusion criteria

- Parents not willing to participate in the study.
- Patient's above 18 years of age groups.
- Swellings other than lymph node origin.

Sample size

150 patients fulfilling all inclusion and Exclusion criteria were enrolled in the study. A written informed consent was obtained from all the subjects before their enrollment in the study.

Methods of collection of data

The brief History including age, sex, site, side and thorough clinical examination was carried out. The FNAC was done in 300 consecutive patients with clinically significant cervical lymphadenopathy by trained and experienced faculty using 20-24 G needle without local anesthesia. Needle was inserted up to the desired depth into the lymph node and firm suction was applied to create negative pressure in the syringe. When an adequate quantity of cellular material was withdrawn, suction was gently released to equalize pressure to prevent sucking of aspirated material into barrel of syringe against walls. A minimum of two well labelled glass smears were prepared. The smears were air dried and stained with May- Grunwald Giemsa (MGG) stain according to standard procedure. Review of all cytological reports were done according to standard guidelines and the diagnosis was classified and correlated with patient age and sex to explore the pattern and association.

Statistical Analysis

All data was collected and verified. Collected data was subjected to SPSS (version 20) for analysis. Data was expressed as frequencies for all the parameters; Chi-square test and Anova test was performed to visualize the difference. P value <0.05 was considered significant.

RESULTS

In this study 150 patients were subjected to FNAC for cervical lymphadenopathy. There were 82 males and 68 females in the study. The male: female ratio in this study was 1.21:1, with a slight male preponderance. The age at presentation ranged from 1 month to 18 years. Maximum number of patients were in the 13 -18 years age group (59 cases, 39.33%) followed by the age group 1 month - 6 years (46 cases, 30.67%) age group. Reactive lymphoid hyperplasia was noted in 44 patients (29.34%). Among these patients 23 patients were in 1 month – 6 age group, 12 patients in 13 – 18 age group and 9 patients in 7 – 12 age group. Tuberculous lymphadenitis accounted for a total of 55 cases (36.67%). This was the most common presentation of cervical lymphadenopathy in the current study. Granulomatous inflammation with coexistent caseous necrosis was the dominant sub category in this group accounting for 27.33 % (41 cases). 2 cases (1.33 %) of Hodgkin's Lymphoma were noted along with 2 cases of Non-Hodgkin's Lymphoma

(1.33%). No other cases of lymph node afflictions such as Rosai Dorfman or Kikuchi's disease were noted in the study.

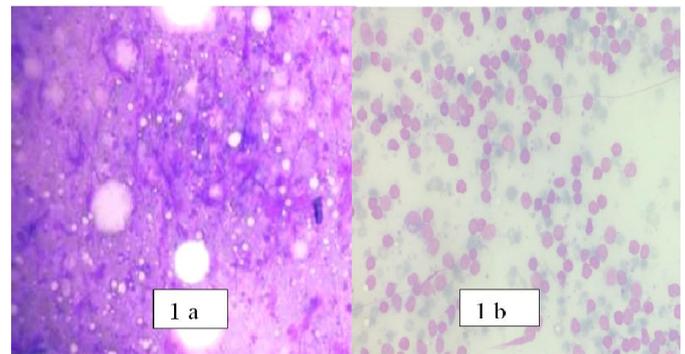


Fig. 1. (a) Photomicrograph showing caseating necrotic material and inflammation(X100); (b) Photomicrograph showing Reactive lymphadenitis (Giemsa stain, X100)

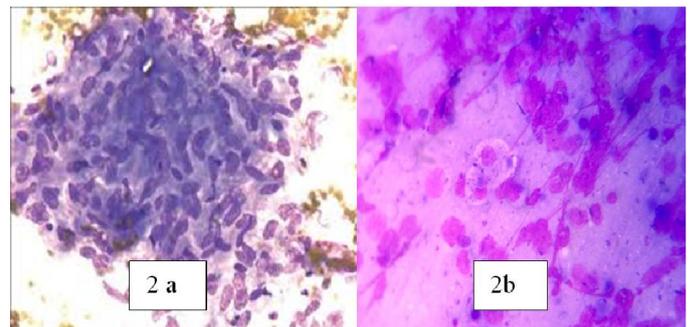


Fig. 2. (a) Photomicrograph showing a cluster of epithelioid granuloma in tubercular lymphadenitis (X400); (b) Photomicrograph showing typical large bilobed R-S cell with large amount of cytoplasm in Hodgkin's lymphoma (X400)

Table 1. Distribution of patients according to the location of Lymph nodes

Location of lymph node swelling	Unilateral		Bilateral
	Right	Left	
Anterior triangle neck	7(4.67%)	8(5.33%)	3(2.00%)
Posterior triangle neck	33(22.00%)	31(20.67%)	9(6.00%)
Supraclavicular region	17(11.33%)	16(10.67%)	2(1.33%)
Submandibular region	2(1.33%)	5(3.33%)	1(0.67%)
Post auricular region	5(3.33%)	6(4.00%)	3(2.00%)
Pre auricular region	-	2(1.33%)	-

Table 2: Cytological diagnosis of lymph nodes

Cytological diagnosis	Number	Percentage(%)
Granulomatous lymphadenopathy	41	27.33
Tuberculous lymphadenitis	55	36.67
Reactive Hyperplasia	44	29.34
Hodgkin's lymphoma	2	1.33
Non-Hodgkin's lymphoma	2	1.33
Non Specific	6	4.00
Total	150	100

DISCUSSION

Lymph nodes are organs found in the neck, chest, underarm, abdomen, and groin. 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 processes (Gosche and Vick, 2006).

Table 3. Sex wise distribution of Cytological diagnosis.

Cytological diagnosis	Male	%	Female	%	Significance
Granulomatous lymphadenopathy	18	22.0%	23	33.8%	Chi-square test, df=2, 95% CI P value >0.001
Tuberculous lymphadenitis	30	36.6%	25	36.8%	
Reactive Hyperplasia	28	34.1%	16	23.5%	
Hodgkin's lymphoma	1	1.2%	1	1.5%	
Non-Hodgkin's Lymphoma	1	1.2%	1	1.5%	
Non Specific	4	4.9%	2	2.9%	
Total	82		68		

Table 4. Age wise distribution of cytological diagnosis

Cytological diagnosis	1-6 year	%	7-12 year	%	13-18 year	%	significance
Granulomatous lymphadenopathy	12	26.1%	10	22.2%	19	32.7%	Chi-square test df=2
Tuberculous lymphadenitis	10	21.7%	22	48.9%	23	39%	
Reactive hyperplasia	23	50.0%	9	20.0%	12	20.3%	94% CI
Hodgkin's lymphoma	0	0.0%	0	0.0%	2	3.4%	
Non-Hodgkin's Lymphoma	0	0.0%	0	0.0%	2	3.4%	P value >0.001
Non Specific	1	2.2%	4	8.9%	1	2.2%	
Total	46		45		59		

Cervical lymphadenopathy is a common problem encountered in pediatric patients and is mostly attributable to infectious etiologies. It is one of the commonest clinical presentations among pediatric patients attending the department. The exact incidence of lymphadenopathy is unknown, but the number varies from 38-45% (Larsson *et al.*, 1994). These are usually found by parents and caregivers. In India about 1.5% of the population is affected with tuberculosis (Pediatric Cervical Lymphadenopathy, 2009). Tuberculous lymphadenitis is a common form of extra pulmonary tuberculosis, approximately 30-40% in reported series. In India, a large number of patients with enlarged cervical, axillary or inguinal lymph nodes are seen in the outpatient clinic. Cervical lymphadenopathy is a very common but challenging medical condition for the family as well as the treating physician (Buli and Lukas, 2015). Around 90% of children aged 4-8 years old have cervical lymphadenopathy (Byun *et al.*, 2006). It has several etiologies ranging from an inflammatory process to a malignant condition; Tuberculosis is one of the challenging and leading health problems in developing countries, with vast social and massive economic implications. Additionally, high incidence of HIV has led to the resurgence of cervical lymphadenopathy in developed countries. Thus posing diagnostic dilemma to a pediatrician. Therefore, it is necessary to arrive at a definitive diagnosis in order to administer proper treatment. FNAC is a very simple and expeditious procedure which can be carried out with ease in children. It has been shown in several studies, that FNAC is fairly accurate in the diagnosis of lymphadenopathy (Handa *et al.*, 2003). 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. FNAC has also been advocated as a useful method in comparison to more expensive surgical excision biopsies in developing countries with limited financial and health care resources (Das, 1999). It almost offers an accurate diagnosis for reactive lymphoid hyperplasia, infectious disease, granulomatous lymphadenitis, and metastatic malignancy. Thus, it can avoid the need for excisional biopsy in most cases and allow rapid onset of therapy (Howlett *et al.*, 2007). In this context we planned to evaluate the role of fine needle aspiration cytology in cervical lymphadenopathy in pediatric age group, study the cytopathological profile of children from Rural India (Hapur) in cervical lymphadenopathy and to identify the common cytopathological pattern of cervical lymphadenopathy.

All the 150 children of cervical lymphadenopathy coming to pediatric department were included in the study between age group 1 month to 18 years with cervical lymphadenopathy. We classified the data as age wise distribution 39.33% patients fell under age range of 13 – 18 years recorded as for maximum & 30 % as for least in age group of 1 – 6 years. As for gender wise distribution of cases 54.67% were male patient and 45.33% were females. Male to female ratio recorded was 1.2:1. Male to female ratio studied by Mishra *et al.*, 2001 and Leon Van de School *et al.*, 2001 was 1.2:1 which is comparable to the present study. This could be due to the prevailing custom of providing more attention to male children in Indian society rather than the real increased biological susceptibility in boys. No other pathological reasons could be added due to lacunae of literature.

Distribution of patients according to the location of the affected lymph nodes. Commonest site of lymph node was posterior triangle of neck 22% had problem in their posterior triangle neck which is comparable to that studied by Knight P.J *et al.* (47.25%). (Knight *et al.*, 1982) A study by Panchal *et al.*, 2014 they also reported posterior triangle of neck as Commonest site of lymph node enlargement, Chhabra, 2006 found in her study that most common site of lymph node involvement was neck, 1.33% had developed swelling in their Right Submandibular region. Right Post auricular region 3.33%, Right Anterior triangle neck 4.67% and right Supraclavicular region 11.33%. Likewise some other patients had problem on the left side. Only a few cases were such who had developed swelling on bilateral sides. Under Cytological diagnosis 31.33% were diagnosed with tuberculous lymphadenitis at maximum, followed by RH (29.33%), least recorded modality was Granulomatous Abscess (1.33%). Narang *et al.*, 2014 in their study found half of the cases as tuberculous lymphadenitis are 50%. Although histopathology is most rewarding for diagnosis of cervical lymphadenitis, its feasibility is limited due to lack of facilities and non-acceptability, being an invasive procedure. Previously, biopsy was used for diagnosis of tubercular lymphadenitis; now it has been greatly replaced by FNAC. In literature, so far, there are only a few reports Available for simultaneous FNAC and culture used for the diagnosis of tuberculosis. Purohit *et al.*, 2015 have used Mantoux test, skiagram chest, histopathology and culture of mycobacteria as diagnostic parameters.

Conclusion

FNAC of lymph nodes is a very useful and simple tool in the diagnosis of cervical lymphadenopathies. A myriad of lesions causing cervical lymphadenopathy can be successfully identified on FNAC. In the current study, the most common causes were tuberculosis, reactive hyperplasia and metastatic malignancies particularly squamous cell carcinoma deposits. FNAC combined with clinical correlation can be used as a first line investigation in work up of lymph node lesions. Further management depending upon the causes.

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