

ORIGINAL ARTICLE / ÖZGÜN ARAŐTIRMA

A clinico-etiological study of cervical lymphadenopathy in children with special reference to ultrasonography

Çocuklarda servikal lenfadenopatinin özellikle ultrasonografi dikkate alınarak klinik ve etyolojik yönden deęerlendirilmesi

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ABSTRACT

Objectives: The aim of this study was to evaluate the etiological factors for cervical lymphadenopathy in children and the role of ultrasonography (USG) in diagnosis.

Methods: A total of 200 children of significant cervical lymphadenopathy between 3 months to 18 years were prospectively included in a tertiary referral hospital. All subjects were evaluated by history, examination, hemogram, chest X-ray, mantoux test, fine needle aspiration cytology (FNAC), acid-fast bacillus (AFB) staining, ultrasonography (USG) of lymph node. Open lymph node biopsy, bone marrow examination, serological tests were optional.

Results: A total of 84 subjects (42%) identified as benign reactive, 80 (40%) as tuberculosis, 20 (10%) chronic lymphadenitis, 12 (6%) non-Hodgkin and 4 (2%) Hodgkin's lymphoma by USG. However, on USG among 84 subjects of benign reactive lymphadenopathy, 60 (71.4%) were having features of benign reactive lymph node, remaining 24 (28.6%) have normal sonogram; out of 80 subjects of tuberculosis lymphadenitis 66 (82.5%) have features of tuberculosis and rest 14 (17.5%) have non-specific ultrasound changes; among 16 subjects of lymphoma, 10 (62.5%) have features of malignancy, rest 6 (37.5%) have nonspecific changes in USG examination. Male to Female ratio was 1.68:1. Cervical lymphadenopathy was most prevalent in 6 to 10 years age group.

Conclusion: Reactive lymphadenitis due to underlying acute bacterial or viral infection was the commonest cause of significant cervical lymphadenopathy in children and ultrasonography is a good noninvasive diagnostic modality, but requires other tests for definitive diagnosis. *J Clin Exp Invest 2010; 1(2): 71-74*

Key words: Cervical lymphadenopathy, ultrasonography, children, diagnosis

ÖZET

Amaç: Bu çalışmanın amacı çocuklarda servikal lenfadenopatinin etyolojik faktörlerini ve ultrasonografinin (USG) tanıdaki rolünü deęerlendirmektir.

Yöntemler: Yaşları 3 ay ile 18 yıl arası deęişen önemli servikal lenfadenopatisi bulunan toplam 200 çocuk prospektif olarak bir üçüncü basamak sevk hastanesinde çalışmaya alındı. Bütün hastalar öykü, fizik muayene, USG, hemogram, akcięer grafisi, PPD testi, ince ięne aspirasyon sitolojisi, aside dirençli boyama ve lenf nodu biyopsisi ile araştırıldı. Açık lenf nodu biyopsisi, kemik ilięi incelemesi ve serolojik testler belli hastalara uygulandı.

Bulgular: Erkek/kız oranı: 1.68/1 idi. Servikal lenfadenopati en sık 6-10 yaşları arasında rastlandı. Ultrason muayenesi ile toplam 84 olgu (%42) selim reaktif, 80'i (%40) tüberküloz, 20'si (%10) kronik lenfadenit, 12'si (%6) ve 4'ü (%2) Hodgkin lenfoma olarak tanı aldı. Ancak, ultrasonografide benin reaktif lenfadenopati olarak bildirilen 84 vakanın 60'ı (%71.4) sitolojik olarak benin reaktif lenf nodu özellięi taşıyordu, geri kalan 24'ü (%28.6) normal sonogram özellięindeydi. Kesin tanısı tüberküloz lenfadenit olan 80 vakadan 66'sında (%82.5) ultrasonda tüberküloz özellikleri saptanırken, geri kalan 14'ünde (%17.5) nonspesifik ultrasonik deęişiklikler saptandı. Lenfomalı 16 hastanın 10'unda (%62.5) malignite özellikleri, geri kalan 6'sında (%37.5) ultrasonda nonspesifik deęişikler saptandı.

Sonuç: altta yatan akut bakteriyel veya viral enfeksiyon nedeniyle oluşan reaktif lenfadenit çocuklarda önemli servikal lenfadenopatinin en sık nedenidir ve ultrasonografi invaziv olmayan iyi bir tanı yöntemi olmakla birlikte hastalığın kesin tanısı için dięer testlerin yapılması gerekir. *Klin Den Ar Derg 2010; 1(2): 71-74*

Anahtar kelimeler: Servikal lenfadenopati, ultrasonografi, çocuk, tanı

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INTRODUCTION

Cervical lymph node enlargement is common clinical finding in pediatric practice¹. Enlargement of lymph node may result from proliferation of lymphocytes intrinsic to the lymph node either due to infection or due to lymphoproliferative disorder or from the migration & infiltration of nodal tissue by either extrinsic inflammatory cells or metastatic malignant cells¹. Etiological profile varies from region to region, in developing country like India, acute respiratory infection; supportive skin infections and tuberculosis are the major causes for regional lymphadenopathy¹. Any failure to decrease in size of lymph node within 10-14 days of treatment, a need for further evaluation is indicated^{1,5,6}.

It may represent normal age related physiological changes^{1,7} or chronic lymphadenopathy like tuberculosis, brucellosis, systemic lupus erythematosus, histiocytosis etc^{1,8}.

Ultrasonography may be useful in evaluating changes in lymph node and extent of lymph node involvement^{2,3,4}. Development of colour Doppler, power Doppler, ultrasound contrast agent has brought new heights in ultrasonographic evaluation of lymph node perfusional pattern^{2,3,4}. Color Doppler sonography provides information about flow and morphology^{2,4}. Whereas vessels in inflamed lymph nodes are dilated,, vessels in metastatic node may be compressed by infiltrating cells^{2,3,4}. The difference in flow pattern in lymph node affected by metastasis and nodes affected by benign processes might permit distinction by means of colour Doppler imaging^{2,3,4}.

METHODS

A total 200 children with significant cervical lymphadenopathy attending department of Pediatrics at GSVM Medical College, LLR and Associated Hospital, Kanpur with age ranging from 3 month to 18 years formed the study material. Study conducted from Jan 2007 to Sept. 2008. Significant lymphadenopathy means (i) Cervical lymph node > 1cm in size. (ii) Lymph nodes which are hard & rubbery in consistency on palpation (iii) Matted/Fixed lymph nodes (iv) lymph node with discharging sinus .A Detailed history with thorough general physical examination and systemic examination was carried out in all the cases. Mandatory investigations

for study includes (i) Hemogram (ii) Mantoux test (iii) Chest X-ray (iv) fine needle aspiration cytology (FNAC) (v) Ultrasonography of lymph node. Additional investigation like biopsy, bone marrow examination, culture, serological tests were done wherever required.

RESULTS

Of the 200 cases in the present study, predominant age group was 6 to 10 year with 88 cases (44%) followed by 1-5 years with 72 cases (36%). There was a male preponderance accounting for 128 cases (64%) with M:F ratio 1.68 : 1. The common symptom noted was swelling in neck region in 200 cases (100%) followed by loss of appetite in 120 cases (60%) followed by fever in 102 cases (51%), cough in 86 cases (43%) , sore throat in 78 (39%) and ear discharge in 16 cases (8%) majority of the cases had bilateral cervical lymphadenopathy in 118 cases (59%).

Table 1. Possible etiology by ultrasonography

USG Diagnosis	No. of Cases	Percentage
Normal study	24	12%
Reactive features	60	30%
Tuberculosis features	66	33%
Malignant features	10	05%
Non-specific changes	40	20%
Total	200	100%

Table 2. Possible etiology by fine needle aspiration cytology (FNAC)

FNAC Diagnosis	n	%
Benign Reactive lymphadenitis	84	42.0
Tuberculosis lymphadenitis	80	40.0
Chronic lymphadenitis	20	10.0
Non-Hodgkin's lymphoma	12	06.0
Hodgkin's lymphoma	04	02
Total	200	100

Generalized lymphadenopathy was observed in 32 cases (16%). History of contact with adult tuberculosis was seen in 16 cases (8%). Out of 200 cases only 59 cases (29.5%) were having BCG scar and in remaining 141 cases, 120 were not immunized and remaining 21 cases (10.5%) were immunized but

not developed BCG scar. Characteristics of patients are shown in Table 1-10.

Table 3. Details of gender distribution of cases

Diagnosis	Gender distribution	
	Male (%)	Female (%)
Reactive hyperplasia	64 (76.2)	20 (23.8)
Tuberculosis lymphadenopathy	36 (45)	44 (55)
Chronic lymphadenitis	16 (80)	4 (20)
Non Hodgkin's lymphoma	8 (66.7)	4 (33.3)
Hodgkin's lymphoma	4 (100)	-
Total (n=200)	128 (64.0)	72 (36.0)

Male: female ratio = 1.68 : 1

Table 4. Age distribution of patients

Age	n (%)
3 month - 5 years	72 (36.0%)
6 -10.0 years	88 (44.0%)
11-18.0 years	40 (20.0%)

Table 5. Distribution of cases according to nutritional status

Diagnosis	Well nourished	PEM			
		I	II	III	IV
Reactive hyperplasia	6 (7.14%)	10	40	24	4
Tuberculosis lymphadenitis	-	2	22	52	4
Chronic lymphadenitis	8	8	4	-	-
Non Hodgkins lymphoma	-	2	4	6	-
Hodgkins Lymphoma	-	-	02	02	-

PEM: Protein energy malnutrition

Table 6. Symptoms Of patients

Symptom	n	%
Swelling in neck	200	100
Loss of appetite	120	60
Fever	102	51
Cough	86	43
Weight loss/Deficient weight gain	62	31
Sore throat	28	14
Ear discharge	16	8

Table 7. Sites of lymphadenopathy in cervical region

Site	n	%
Posterior cervical	40	20
Submandibular	42	21
Jugulo-digastric	90	45
Supra clavicular	-	-
Occipital	14	7
Posterior auricular	14	7

Table 8. Associated findings

Findings	n	%
Tonsillitis and / or pharyngitis	42	21
Ear infection	16	8
Skin Lesions over scalp	22	11
Orodental infections	18	9
Hepatomegaly/splenomegaly	40	20
Rash	4	2

Table 9. Details of total leucocyte count in study group

Diagnosis	n	Total leucocyte count	
		Normal	Increased
Reactive hyperplasia	84	36 (42.9%)	48 (57.1%)
Tuberculosis lymphadenitis	80	48 (60.0%)	32 (40.0%)
Chronic lymphadenitis	20	16 (80%)	4 (20%)
Hodgkin's lymphoma	4	4(100%)	-
Non-Hodgkin's lymphoma	12	8(66.7%)	4(33.3%)

Table 10. Distribution of cases according to differential leucocyte count,

Diagnosis	Lymphocytosis	Normal distribution	PNL
Reactive hyperplasia	0	0	84 (100%)
Tuberculosis lymphadenitis	80 (100%)	-	-
Chronic lymphadenitis	18 (90.0%)	2 (10.0%)	-
Hodgkin's lymphoma	-	-	4 (100%)
Non-Hodgkin's lymphoma	8 (66.67%)	4 (33.33%)	-

PNL: polymorphonuclear leucocytosis

DISCUSSION

In this study an attempt was made to study the etiology of children with cervical lymphadenopathy after correlating history, clinical findings and relevant laboratory and sonographic diagnosis. In our study, majority of the children presenting in age group of 6 years to 10 years, probably due to increase in exposure to surrounding environment; however Reddy MP *et al.*¹¹ noted majority in 4-8 years group but Knight *et al.*⁹ emphasized in one of the largest studies relating age to lymphadenopathy that age is not important in predicting the incidence of significant lymphadenopathy. In our study there is male preponderance (M:F ratio = 1.68:1) but there is no such predilection of sex in study by Mishra SD *et al.*⁹

In the present study predominant symptom was swelling in neck followed by loss of appetite and fever while in the study by Reddy MP *et al.*¹¹ & Doddamani M *et al.*⁴ predominant symptom was swelling in neck followed by fever & cough. In the present study children with history of contact with adult tuberculosis was present in 8% cases, however Reddy MP *et al.*¹¹ noted in 90% and Doddamani M *et al.*⁴ noted in 3.12% cases. BCG scar was noted in 29.5% cases, however study by Doddamani M *et al.*⁴ and Reddy MP *et al.*¹¹ had 78.12% and 78% respectively. This may be attributed to poor immunization practices in this region.

In the present study, the commonest cytopathological finding was reactive lymphadenitis in 42% cases followed by tuberculosis lymphadenitis 40% and chronic lymphadenitis and malignant lymphadenitis as 10% and 08% respectively Doddamani M *et al.*, Lake *et al.*⁴ and Reddy MP *et al.*¹¹ also noted the commonest cytopathological finding as reactive lymphadenitis followed by granulomatous lymphadenitis. Tuberculosis lymphadenitis which was observed in the present study correlated positively with increasing risk factors like unimmunized status positive Montoux test, positive history of contact and poor nutrition. High incidence of reactive lymphadenitis may be attributed to infections due to poor hygienic conditions, overcrowding and low socio-economic status.

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