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Original Article

Cervical Lymphadenopathy: A Prospective Study in Rajiv Gandhi Institute of Medical Sciences, Srikakulam, Andhra Pradesh

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Abstract

Background: Enlargement of cervical lymph nodes is the most common form of peripheral lymphadenopathy often encountered clinical entity in the surgical operative. Clinical evaluation and diagnosis is supported by fine-needle aspiration cytology (FNAC) or by biopsy.

Purpose: This study was done to evaluate the causes of cervical adenopathy in the patients attending Rajiv Gandhi Institute of Medical Sciences (RIMS) General Hospital. Srikakulam, Andhra Pradesh. Cytological findings of FNAC were compared with histological reports of biopsy.

Materials and Methods: This study was conducted on 146 patients who presented with a complaint of cervical lymphadenopathy to RIMS General Hospital, Srikakulam, from January 2015 to July 2016. A detailed history regarding duration, associated clinical features, family history were recorded. The complete clinical examination was done along with routine laboratory investigations including chest X-ray, and special tests, like Mantoux, was done for appropriate patients.

Results: A total of 146 patients were evaluated in our study. The various causes of cervical adenopathy according to cytomorphological patterns and their frequency of occurrence in relation to the age and sex groups and the cytology of FNAC were correlated with histopathology reports of the open biopsy of the excised lymphnode. For FNAC, diagnostic accuracy of 93% was observed. The sensitivity and specificity of FNAC for various lessons was calculated in tables given in the article.

Conclusion: Tuberculosis is the most common cause of cervical lymphadenopathy and more than one-third (37.33%) of cases are seen in pediatric age group. FNAC is simple minimally invasive with least complications and with a diagnostic sensitivity of 93% and can be used as a primary investigatory tool.

Key words: Cervical lymphadenopathy, Fine-needle aspiration cytology, Histopathological examination, Tuberculosis

INTRODUCTION

Cervical lymphadenopathy implies an abnormal increase in size and altered consistency of lymph nodes. It is often used synonymously as swollen/enlarged lymph nodes. Cervical adenopathy is fairly common clinical presentation often poses a challenge to the attending clinician in making the diagnosis and in ascertaining the management of the disease. Cervical lymphadenopathy can present as an isolated feature or as part of generalized lymphadenopathy.[1,2] Cervical adenopathy is divided into: (1) Acute lymphadenopathy (less than 2 weeks duration), (2) subacute lymphadenopathy (2-6 weeks duration), and (3) chronic lymphadenopathy (more than 6 weeks duration).[3] In pediatric age group, tuberculosis (TB) is the most common cause followed by pyogenic infections whereas in adults and older people carcinoma of head and neck region are the most common cause. These cases of cervical lymphadenopathy were evaluated clinically. Radiologically, pathologically by fine-needle aspiration cytology (FNAC) and biopsy of excised lymph nodes. As compared to open biopsy, FNAC has come up in a long

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way as parallel but as a separate mode of investigation in the diagnosis of cervical lymphadenopathy. Diagnosis is obtained quickly. Complications are almost negligible and diagnostic accuracy is high.[4]

This study was done with the objective of evaluating the causes of cervical adenopathy and to find out the epidemiological factors pertaining to cervical lymphadenopathy and the role of FNAC as compared with an open biopsy.

MATERIALS AND METHODS

This study was done over the patients attending to the outpatient Department of Surgery of General Hospital of Rajiv Gandhi Institute of Medical Sciences, Srikakulam of Andhra Pradesh from January 2014 to July 2016 with a complaint of enlarged or swollen lymph nodes of the neck. A detailed history was taken and a note was made regarding age, sex, duration of symptoms and history of contact with a known TB patient. A complete physical examination of the patient is done with special reference to the size, number, site of the involvement, side, mobility, and consistency. Routine laboratory investigations such as total count, differential count, and erythrocyte sedimentation rate (ESR) were done and chest X-ray taken on suspected case of TB lymphadenitis. Special investigations like sputum for AFB, Monteux test were done in suspected TB patients FNAC, and biopsy was done on the enlarged lymph nodes. The pathologist who performed the histopathological examination of biopsy specimen was unaware of FNAC findings. Finally, the results of FNAC and histopathological examination were compared for sensitivity, specificity - and diagnostic accuracy of FNAC was calculated.

OBSERVATIONS

A total of 146 patients were evaluated in our study. The various causes of cervical adenopathy according to cytomorphological patterns, and their frequency of occurrence in relation to the age and sex groups is shown in Table 1. Males were more commonly involved.

ESR was found to be raised in 5342% of the cases. In the cases of TB lymphadenitis a history of contact is present in 19 cases. ESR was raised in 58 cases (77.33%). Co-existing active lesions of TB in X-ray chest are seen 7 cases (9.33%). Mantoux test was positive in 49 cases (65.33%). Hodgkin's lymphoma - 11 cases. Non-Hodgkin's lymphoma - 7 cases. Ratio of Hodgkin to non-Hodgkin is 1.58:1. Metastatic cervical nodes 18 cases primary was found in 11 cases. In metastatic lymph nodes, the most common histopathology is squamous cell carcinoma. The most common primary site found is an oral cavity (Palate – 2). Tongue 2 buccal mucosa (floor of the mouth). Next most primary site is thyroid. The most common histopathology of cervical metastases is squamous epithelium. The cytology of FNAC was correlated with histopathology reports of the open biopsy of the excised lymph node (Table 6). For FNAC, diagnostic accuracy of 93% was observed. The sensitivity and specificity of FNAC for various lessons was calculated in Table 7.

DISCUSSION

Lymph nodes are considered as fortress of immune defense.[1]

Lymph nodes are encapsulated centers of antigen presentation and lymphocytic activation, differentiation and proliferation. They produce mature, antigen-primed, B and T cells and filter particles, including microbes, from the lymph by the action of numerous phagocytocytic macrophages. These specialized immune cells named as lymphocytes, detect and combat the pathogens in the body. When inflamed these nodes get swollen, enlarges to produce the more number of lymphocytes.[5]

Howard and Lund had focused on an idea of having approximately 800 lymph nodes in our body and 300 of them are located in the cervical region alone.[6] Cervical

Table 1: Age distribution

Lymphoma	Tuberculous		Reactive		Hodgkin's lymphoma		Non-Hodgkin's lymphoma		Metastatic		Total		Total (%)
	M	F	M	F	M	F	M	F	M	F	M	F	
0-10	8	5	4	6	0	0	0	0	0	0	12	11	23 (16)
11-20	9	6	7	2	0	0	0	0	0	0	16	9	25 (17.40)
21-30	12	7	4	3	1	4	0	0			17	14	31 (21.60)
31-40	9	8	3	0	0	0	1	0	1	0	13	8	21 (14.60)
41-50	6	4	2	1	1	0	2	1	1	0	11	7	18 (11.88)
51-60	1	0	2	1	1	0	4	0	1	2	8	4	12 (7.69)
61-70	0	0	1	0	0	0	2	0	5	2	6	4	10 (7.61)
71-80	0	0	0	0	0	0	0	0	4	2	4	2	6 (4.10)
Total	45	30	23	13	3	4	9	1	12	6	87	59	
	75		36		7		10		18		146		146

lymphadenopathy has been defined as cervical lymph nodes measuring more than 1 cm in diameter.[3] It is most frequent among all age groups. Significant anxiety surrounds the finding of cervical lymphadenopathy both to the patient and to the attending clinician, due to the concern of the underlying pathology. Numerous studies have been conducted on cervical lymphadenopathy. Cervical lymph nodes are the most frequently enlarged and biopsied nodes, of all the peripheral lymph nodes.[7]

The most cases can be diagnosed on the basis of a careful history and detailed clinical examination. The causes include microbiological. Hematological, neoplastic and connective tissue disorders.[8] In our study, cervical lymphadenopathy is of non-neoplastic in 76% of cases, the incidence of neoplasia is 24%. These findings were consistent with the findings of Biswas *et al.* (2013). They found an incidence of non-neoplastic in 71.6% and neoplastic in 28.3% of the cases. In a similar study by Rajesh Kumar Padhy *et al.* (2015) found an incidence of non-neoplasia in 71% of the cases and neoplasia in 29%.

In our study, males are a more affected than females. Males to female ratio is 1.8:1. This is similar to the findings of the study by Rajesh Kumar Padhy *et al.* (2013), Pandav *et al.* (2012), Adhikari *et al.* (2011), who found male preponderance with a male to female ratio being 1.17:1, 1.07:1, 1.2:1, respectively. Cervical lymphadenopathy is most commonly seen in our study in the age group of 20-30 years (21.67%) followed by the age group of 30-40 years (14.65%), similar to studies by Rajesh Kumar *et al.* (22% in the age group of 20-30 years and 18% in the 4th decade). In another study, Dukare *et al.* (2014) reported an increased incidence of 23.34% in the 3rd decade and 15.49% in the 4th decade. Pandav *et al.* reported a maximum incidence in the 3rd decade 21%.[9-15]

Our findings are consistent with these findings. In this study, TB was the most common cause of lymphadenopathy (51.6%), followed by reactive/nonspecific lymphadenopathy (24.6%), consistent with findings of Rajesh Kumar *et al.* (TB 45%, reactive/non-specific 26%). Similarly, Vedi *et al.* (2013) reported TB in 50% of cases and in 30% of cases. Similar results have been highlighted in other studies. Lymphadenopathy is most commonly unilateral 76% and bilateral in 24% of our cases, right side is most frequently involved (43%). Our findings are consistent with other studies.[16-20]

Table 2: Examination findings

	Clinical features					
Variable	**Tuberculous**	**Reactive**	**Hodgkin's lymphoma**	**Non-Hodgkin's lymphoma**	**Metastatic**	**Total (%)**
Size (cm)						
<3	48	28	2	2	4	85 (58.21)
3-6	23	8	8	8	6	49 (33.56)
>6	4	0	0		8	8 (8.21)
Side						
Unilateral						
Right	41	19	3	1	9	73 (50)
Left	28	10	3	2	5	48 (32.87)
Bilateral	6	7	1	7	4	25 (17)
Consistency						
Soft	30	11	1	1	1	44 (30)
Firm	42	24	6	9	1	82 (56)
Hard	3	1	0	0	16	20 (14)
Mobile	71	34	6	9	6	106 (73)
Fixed	4	2	1	1	12	20 (14)
Number of groups						
Single	61		0	0	4	87 (59.58)
Two groups	8		3	6	8	34 (23.22)
>2 groups			4	4	6	6 (17)

Table 3: Site distribution of affected lymph nodes

Site	**Tuberculous lymphadenitis**	**Reactive**	**Hodgkin's lymphoma**	**Non-Hodgkin's lymphoma**	**Metastatic lymph adenitis**	**Total (%)**
Level 1	3	9	0	1	2	15 (10)
Level 2	23	14	1	2	2	40 (27)
Level 3	7		1		6	14 (10)
Level 4	2				3	5 (3)
Level 5	40	13	6	9	4	72 (48)
Level 6	0					
Total	75					

	Rajesh *et al.* (%)	Vedi *et al.* (%)	Baskota *et al.* (2013) (%)
Unilateral	80	78.56	83
Bilateral	20	21.42	17
Right side	47	42.85	

In this study (Table 2), 74.64% of lymph nodes are mobile while only 25.36% of lymph nodes are fixed to the surrounding structures. This finding is consistent with those of Raresh *et al.* (mobile 80% fixed 20%), Chamyal and Sabarigrish (1997) found mobile lymphnodes in 60% and fixed nodes in 26%; of cases. In our study, a single group of lymphnodes found to be involved in 59.5% of cases and more than 2 groups involved in 17.21% of the cases. This study is in accordance with the study of Rajesh *et al.* who found results of 63% and 14%. Ismail and Mohammad (2013) found the figures of 60% for a single group and 12.7% for the involvement of more than 2 groups. The observed results are similar to the findings of Baskota *et al.* (2004) who found that a single group is involved in 68% of the cases and more than 2 groups were involved in13% of the cases.[20-25].

Table 4: Tubercular lymphadenitis

Tuberculous lymphadenitis	*n* (%)
Chest X-ray	
Positive	7 (9.33)
Negative	68 (90.66)
Nodal status	
Discrete	32
Matted	43 (42.66)
ESR (mm)	
<20	17 (23)
>20	58 (77.33)
Mantoux	
Positive	49 (65.33)
Negative	26 (34.66)
History of contact	19 (25)

In this study (Tables 3 and 4), out of the 75 cases of TB lymphadenitis only 7 cases had coexisting active TB lesions confirmed by chest X-ray (9.33%). This finding is in accordance with findings of Daudopota *et al.* (2013) and Magsi *et al.* (2013) who had reported coexisting active TB lesions in chest in 3.64% and 7.5% cases, respectively. 19 cases had history of contact (24.66%) with a TB patient. This study is in accordance with that of Rajesh *et al.* and Ismail and Mohammad who reported a contact of 24.4% and 27%, respectively. Nodes were matted in 54 cases (72%) and discrete in 21 cases (28%).

In this study, out of 17 lymphoma cases, 11 cases are Hodgkin's lymphoma and 6 cases are non-Hodgkin's lymphoma. The ratio of Hodgkin's to non-Hodgkin's lymphoma is 1.5:1. The findings were similar to another study by Vedi *et al.* and by Rajesh *et al.* In this study (Table 5), metastases were present in 18 cases (12.33%). In 13 cases (72.23%), primary site of malignancy is found. In 28% cases the primary site was not found. Out of the 13 cases in which the primary was found tumors of squamous

Table 5: Distribution of primary site in cases of metastatic secondaries in neck

Primary site	Origin Site			Number of cases	(%)	Percent
Known	Squamous cell of origin	Oral cavity	2	5	28	
		Tongue/Buccal mucosa	1			
						46
		Palate	1			
		Nasopharynx	1	1	6	
		Larynx		1	6	
		Lung	1	1	6	
	Non squamous cell of origin	Thyroid	4	4		
		Parotid	1			
Unknown			7			

Table 6: Correlation of histopathological (biopsy) diagnosis and cytological (FNAC) diagnosis

Clinical diagnosis	Number of FNAC cases	Number of histopathological diagnoses					
		Tuberculous	Reactive	Hodgkin's lymphoma	Non-Hodgkin's lymphoma	Metastatic	Accuracy (%)
Tuberculous	71	69	3	1	0	2	95.7
Reactive/non specific	36	4	30	1	0	1	83.7
Hodgkin's lymphoma	7	0	1	6			85.52
Non-Hodgkin's lymphoma	11	1	0	0	10	0	100.00
Metastatic	21	0	2	0	0	3	85.05

FNAC: Fine-needle aspiration cytology

Table 7: Sensitivity and Specificity of FNAC in Cervical lymphadenopathy

FNAC diagnosis	Sensitivity (%)	Specificity (%)
Tuberculosis	95.7	96.86
Reactive/non-specific	83.7	95.66
Lymphoma	85.52	100
Metastatic secondaries	85.05	97.0

FNAC: Fine-needle aspiration cytology

origin were (61%). Non-squamous tumors origin was 39%. Among the non-squamous, the primary is found in thyroid (22.22%) and parotid (5.5%). In the squamous group, the primary is most commonly seen in oral cavity (60%) and nasopharynx (20%) and lung and larynx (20%). These results were similar to those of Prasad and Mohan (2014). They reported primary in the oral cavity in 48.5%of the cases. In another study by Afroz *et al.* in non-squamous metastatic deposits primary is found in thyroid in 15.09% of the cases.

The overall diagnostic accuracy of FNAC in the case of cervical lymphadenopathy in our study is 95%. Which is similar to the results of Rajesh *et al.*, (2015), Adhikari *et al.* (2011) 11, and Biswas *et al.* who reported an overall accuracy of 92% 90.9%, 88.4%. FNAC.[26-32]

Table 8: Diagnostic Accuracy of FNAC

In present study	Tuberculous lymphadenopathy	Sensitivity (95%)	Specificity (97%)
Study by Rajesh		91.11	93.6
BIswas S *et al*. (2014)		86.6	100
Shrestha *et al*. (2010)		85.71	94.82
In present study	Non-specific/reactive	83.7	94.5
Study by Rajesh		89.65	95.96
Quadri *et al*. (2012)		86	95.9
In present study	Lymphoma	85.7	100
Rajesh		75	100
Singh *et al*. (2014)		81.4	99.3
In the present study	Metastatic/ secondaries	85.5	97.25
Rajesh *et al*.		83.6	96.20
Biswas *et al*. (27)		100	96.15

Although open biopsy is the gold standard for diagnosis of cervical lymphadenopathy, equal results were seen with FNAC. Open biopsy is associated with higher incidence of complications FNAC is least expensive, minimal invasive, associated with minimal complications (Table 8).

CONCLUSION

TB Lymphadenitis is the most common cause of cervical lymphadenitis followed by reactive and metastatic secondaries. The most common cause of secondaries in the neck is a primary malignancy of oral cavity, the most common cause of non-squamous secondaries are secondary to malignancy of Thyroid. Although open biopsy of lymph nodes is the gold standard, FNAC is cheap, least invasive with least complications and a primary modality of investigation in evaluating the cause of lymphadenopathy.

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