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RESEARCH ARTICLE

CYTOLOGICAL PATTERN OF HEAD AND NECK LYMPHADENOPATHY: A STUDY  
AT A TERTIARY CARE CENTRE

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ABSTRACT

Lymphadenopathy is one of the commonest causes of head and neck swellings with etiology varying from benign to malignant conditions. Fine Needle Aspiration Cytology has emerged as an easy, quick, cost effective, minimally invasive and safe technique, with high sensitivity and specificity, in the evaluation of lymphadenopathy. The present study was done with the aim of studying the pattern of various lymph node diseases present in Head and neck region. It was an observational study conducted in the department of pathology Government Medical College, Srinagar from 1<sup>st</sup> July 2013 to June 2015. A total of 711 cases were studied during this period out of which 82.3% cases were benign and 17.7% cases were diagnosed as malignant. Patients ranged from 2 months to 90 years in age with male to female ratio of 1.2:1. Non specific reactive hyperplasia was the most common diagnosis (66.9%) followed by metastatic tumours (13.2%), Chronic granulomatous lymphadenitis (10%), tuberculosis (6.5%) and Lymphomas (4.5%). Benign causes of lymphadenopathy were found more commonly in younger age groups whereas malignant especially metastatic infiltration was found in older age groups. The underlying causes of lymphadenopathy were varied, Fine Needle aspiration cytology was a useful first line investigating tool in arriving at a diagnosis.

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INTRODUCTION

Head and neck lymphadenopathy is a commonly encountered clinical problem in all the age groups. The causes can be either benign or malignant (Australian Cancer Network Diagnosis, 2005). The most common cause of lymphadenopathy in general and Head and Neck in particular is reactive hyperplasia especially in younger patients. However, with increasing age, and in nodes over 2 cm in size which are firm or matted and non tender the likelihood of malignancy increases (Ferrer, 1998). The causes of lymphadenopathy vary according to the geographical location and socioeconomic setup (Ahmad, 2009). In developing countries Tuberculosis is still one of the common causes of cervical lymphadenopathy (Pamra, 1987) Fine Needle aspiration (FNA) is an extremely useful, quick, safe, simple and cost effective technique to diagnose the various causes of lymphadenopathy (Gupta, 1991; Perkins, 1995). The main objective of our study is to elucidate the various diseases presenting with head and neck lymphadenopathy in our hospital.

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MATERIALS AND METHODS

This study was an observational study conducted in the department of pathology, government medical college, Srinagar over a period of two years from 1<sup>st</sup> July 2013 to 30<sup>th</sup> June 2015. All the cases of head and Neck lymphadenopathy which were aspirated blindly or under image guidance were included in the study. The nodes included were pre and post auricular, infra auricular, submandibular, submental, upper and middle juglar, posterior triangle, and supra clavicular. All the FNA smears were stained with may Grunwald Geimsa (MGG), PAP and H&E stain as per the protocol. Special stains like Ziehl Neelsen stain for acid Fast Bacilli were used wherever needed. All the clinical details including age, sex, site, laterality, size and other relevant clinical investigations were recorded. Slides were reviewed and the cases with equivocal results or inadequate material were excluded from the study. The slides were examined for cytomorphological details and diagnosis was reviewed. The cases were divided into two main groups, Benign and Malignant. Benign group included non specific reactive hyperplasia, acute suppurative lymphadenitis, chronic granulomatous lymphadenitis and tubercular lymphadenitis. The cases with AFB positive chronic granulomatous inflammation were categorised separately as tuberculous lymphadenitis, whereas malignant group included

metastatic tumours and lymphomas. Data was analysed using the Statistical Package for Social Science (SPSS version 20) for windows.

## RESULTS

A total of 8464 Fine needle aspirations were done in our department from July 2013 to June 2015. The aspirations were done from various palpable and non palpable body and peripheral swellings (with or without image guidance).

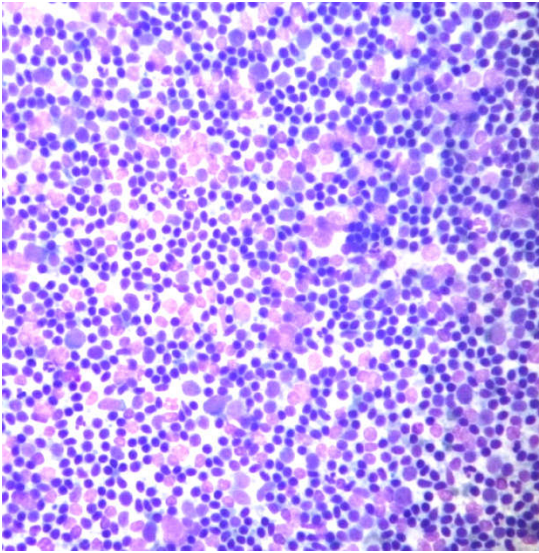
The most common overall diagnosis was non specific reactive hyperplasia (Fig 1), constituting 66.9% (447 cases) of the cases whereas the second most common benign diagnosis was chronic granulomatous lymphadenitis (Fig 2) constituting 10% (71 cases), Tuberculous lymphadenitis constituted 6.5% (46 cases) and acute suppurative lymphadenitis constituted 3% of cases (21 cases) (Table 1). Of the malignant diagnosis, metastatic tumours constituted 75% (94 cases) and lymphomas constituted 25% (32 cases).

**Table 1. Cytological diagnosis and age distribution**

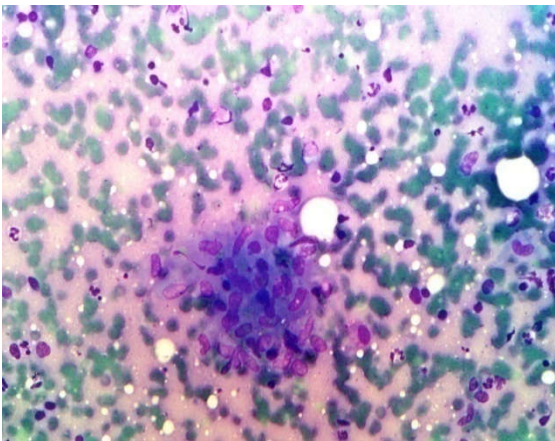
Diagnosis	Sex	Age group (Years)						Total
		0-15	16-30	31-45	46-60	61-75	76-90	
Acute suppurative lymphadenitis	M	8	2	2	0	0	0	12
	F	6	0	2	0	1	0	9
Non specific reactive lymphadenitis	M	106	90	34	19	8	0	257
	F	51	79	43	13	4	0	190
Chronic granulomatous lymphadenitis	M	5	5	8	6	1	0	25
	F	6	27	6	4	3	0	46
Tubercular lymphadenitis	M	1	12	2	1	1	0	17
	F	5	19	2	2	1	0	29
Metastatic squamous cell carcinoma	M	0	0	2	7	8	0	17
	F	0	0	0	5	4	1	10
Metastatic adenocarcinoma	M	0	1	0	7	7	3	18
	F	0	0	1	5	2	1	9
Metastatic poorly differentiated carcinoma	M	0	0	1	4	5	1	11
	F	0	0	2	4	3	1	10
Metastatic papillary carcinoma thyroid	M	0	1	1	0	0	0	2
	F	0	3	2	0	0	0	5
Metastatic medullary carcinoma thyroid	M	0	0	1	0	0	0	1
	F	0	0	0	0	1	0	1
Metastatic small cell carcinoma	M	0	0	0	1	1	0	2
	F	0	0	0	0	0	0	0
Metastatic large cell carcinoma	M	0	0	0	0	1	0	1
	F	0	0	0	0	0	0	0
Metastatic Infiltrating ductal carcinoma	M	0	0	0	0	0	0	0
	F	0	0	0	2	1	0	3
Metastatic malignant melanoma	M	0	0	0	0	0	0	0
	F	0	0	0	0	1	0	1
Metastatic renal cell carcinoma	M	0	0	0	0	0	0	0
	F	0	0	0	0	1	0	1
Metastatic germ cell tumour	M	0	0	1	0	0	0	1
	F	0	0	0	0	0	0	0
Metastatic spindle cell sarcoma	M	0	0	0	1	0	0	1
	F	0	0	0	0	0	0	0
Non hodgkins lymphoma	M	2	1	5	4	4	0	16
	F	2	0	0	1	4	0	7
Hodgkins lymphoma	M	1	1	2	2	1	1	8
	F	1	0	0	0	0	0	1
Total	M	128	13	59	52	37	5	389
	F	71	128	58	36	26	3	322

Out of these, 711 cases of head and neck lymph node aspirations were included in the present study. Out of 711 cases 82.3% (585 cases) were benign and 17.7% (126 cases) were malignant. Males constituted 54.7% (389 cases) of cases whereas females constituted 45.3% (322 cases) of cases with a male to female ratio of 1.2:1. The cervical lymph nodes were the most commonly involved (56%) group, followed by submandibular (13.1%) and supraclavicular (9%) groups. Right sided nodes were more commonly involved. The age ranged from 2 months to 90 years with a mean age of 30.27 years. Majority of the benign cases were seen in the age group of 0-30 years with benign reactive hyperplasia being the most common cause, whereas majority of the malignant cases occurred in the age group of 46-75 years (Table 1).

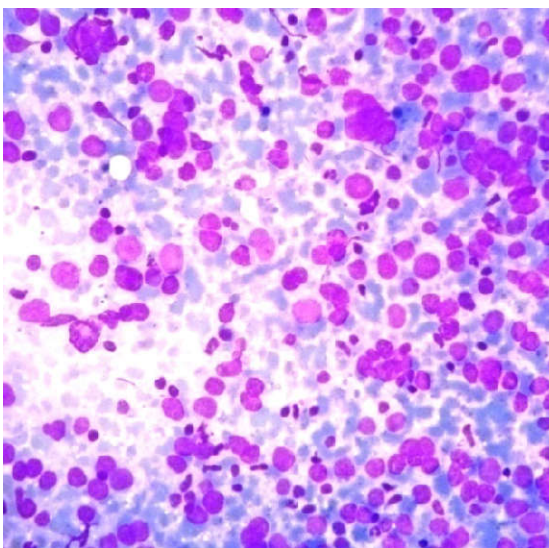
Among the metastatic tumours, squamous cell carcinomas and adenocarcinomas constituted 3.8% of all cases individually (i.e 27 cases each). Metastatic poorly differentiated (undifferentiated) carcinomas constituted 3% of all cases (21 cases) which could not be further categorized on MGG stain. Among lymphomas, Non Hodgkin Lymphomas constituted 3.2% of all cases (i.e 23 cases). Hodgkins lymphoma constituted 1.3% of all cases (i.e 9 cases). Also, seven cases of metastatic papillary carcinoma of thyroid, three cases of metastatic infiltrating ductal carcinoma, and two cases each of metastatic small cell carcinoma lung and medullary carcinoma of thyroid. were seen. Besides, one case each of metastatic large cell carcinoma of lung, malignant melanoma, renal cell carcinoma and spindle cell sarcoma were also seen (Table 1).



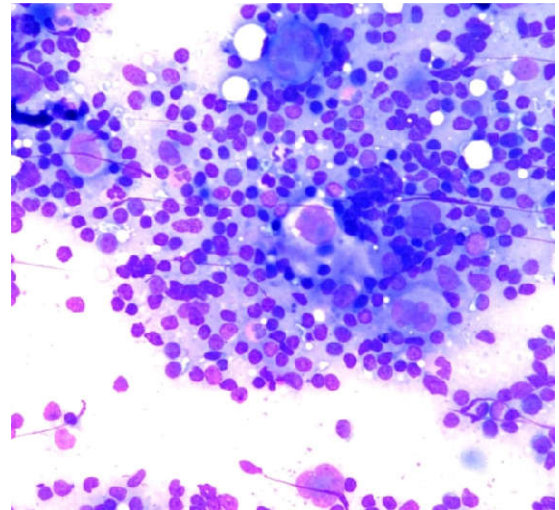
**Fig. 1. Non Specific reactive Lymphnode, Photomicrograph showing polymorphous population of lymphocytes with predominance of mature lymphocytes (400x, MGG stain)**



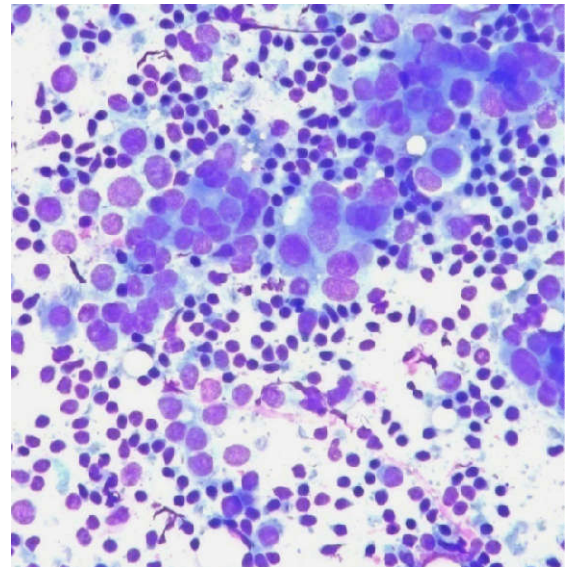
**Fig. 2. Chronic Granulomatous Lymphadenitis, Photomicrograph showing epithelioid cell granuloma in reactive nodal background (400x, MGG Stain)**



**Fig. 3. Non Hodgkin lymphoma, Photomicrograph showing monomorphous population of lymphocytes (400x, MGG Stain)**



**Fig. 4. Hodgkins lymphoma. Photomicrograph showing Reed Sternberg cells in a polymorphous lymphoid background (400x, MGG Stain)**



**Fig. 5. Metastatic Adenocarcinoma, Photomicrograph showing malignant epithelial cells forming glandular pattern in a lymphoid background (400x, MGG Stain)**

## DISCUSSION

Enlarged lymph nodes were the first organs to be sampled by fine needle aspiration and even today they are among the most frequently sampled swellings of the body (Labert, 2010). In children lymph nodes react more quickly to a number of micro organisms and non specific stimuli by enlargement. However, in adults and elderly persons the presence of lymphadenopathy usually raises concern about more serious causes like metastasis from various organs or lymphomas. FNAC can tremendously reduce the number of excisional biopsies which are being done for the diagnosis of cervical lymphadenopathy thus reducing the time, cost and the occurrence of complications like scars and injuries to the vital organs present in the neck area (Geisinger, 1999). The age range in the case of lymphadenopathies is wide. In our study also, it ranged from 2 months to 90 years with a mean age of 30.2 years. The age range in our study was similar to other studies (Steel, 1995;

Hirachand, 2009); Qadri, 2012; Sharma, 2015). As children and young adults respond to even minor infections by lymph node enlargement so the most common cause of lymphadenopathy in them is non specific reactive hyperplasia. Similar observations were made in our study with most common cause of lymphadenopathy in patients <30 years being nonspecific reactive hyperplasia. In our study of head and neck lymph nodes, cervical lymph nodes were the most commonly involved (56%) followed by submandibular (13.1%) and supraclavicular (9%). Similar pattern of involvement of lymph nodes was found in an Ethiopian study and Egyptian study (Gemechu 2015, 2015; Hafez, 2011)

In our study lymphadenopathy was seen more commonly among males as compared to females with a ratio of 1.2:1 which is concordant with other studies (Gemechu, 2015; Shakya, 2009; Baji, 2014). In our study benign disorders were the cause of lymphadenopathy in majority of cases (82.3%) as compared to malignant ones (17.7%) with reactive hyperplasia of lymph node being the most common diagnosis followed by chronic granulomatous inflammation which is almost similar to the results were seen in other studies also (Hirachand, 2009; Shakya G; Pandey P). However, many studies within Indian and other developing countries have shown tuberculosis as the commonest cause of benign lymphadenopathy (Sharma, 2015; Gemechu, 2015; Baji, 2014; Ahmed, 2008). The malignant causes of lymphadenopathy in our study constituted 17.7% of cases, similar to the observations made by Hirachand *et al.* (2009) (18.3%) and Baji (16%) *et al.* However, studies by Steel *et al.* (1995) and Qadri *et al.* (2012) observed a higher percentage of malignancy, 53.8% and 38.2% respectively. The lower percentage of malignancy in our study may be due to the fact that majority (61%) of our patients belonged to < 30 year age group, where the incidence of malignancy is lesser as compared to middle age and elderly people.

Lymphomas (including both hodgkins and non hodgkins lymphomas) constituted 4.5% of our primary nodal malignancies which is comparable with studies of Hirachand (2009), Qadri (2012) and Pandey (2013). The male to female ratio for lymphomas was found to be 3:1, similar to the results seen by Qadri (2012) and Gemechu (2015). There were 23 cases of non-Hodgkins lymphoma (Fig. 3) (16 in males and 7 in females), and nine cases of Hodgkins lymphoma (Fig. 4) (8 in males and 1 in female). Our results though seen in small number of cases clearly show lymphomas to be more common in males as compared to females. Hodgkins lymphoma was evenly distributed in different age groups but non Hodgkins lymphoma occurred more frequently in adults and elderly group with maximum number of cases (78.2%) seen in the age group of 46-75 years with peak seen in 61-75 year age group.

Metastatic involvement of lymph node constituted 13.2% of all cases (i.e 94 cases) in our study. It was the second most frequent diagnosis after reactive hyperplasia. Comparable results were reported by many Indian studies (Hirachand, 2009; Baji, 2014). However, varied results have been reported in various studies with some studies (Steel, 1995; Qadri, 2012; Alam, 2010) observing higher frequency whereas other studies (Gemechu, 2015; Shakya, 2009) observing lower percentage of lymph node metastasis. This variation could be because of the

differences in the range of age included, the clinical setup and the referral systems (many studies have included suspicious or malignant cases only). In our study majority of the patients were <30 years of age with benign conditions being the most common cause of lymphadenopathy thus accounting for lower percentage of metastatic lymphadenopathy in our study as compared to other studies. Most of the Indian studies have found squamous cell carcinoma to be most common cause of metastatic lymphadenopathy in head and neck region (Wilkinson, 2012; Khajuria 2006). However, in our study metastatic adenocarcinoma (Fig. 5) and squamous cell carcinoma occurred with equal frequency. One of the reasons for this observation could be the higher incidence of the tumours of the digestive tract in our valley (Shah, 1990; Dhar, 1993). However, more studies in this regard to discern the actual trend are needed. Also, in case of poorly differentiated carcinomas and lymphomas, excision and IHC correlation needs to be done to arrive at a definitive diagnosis and exact categorisation. To conclude, the type of lymph node disease will depend upon many factors like age, clinical set up, gender etc. FNAC is an excellent tool, as in majority of the cases no further evaluation needs to be done for the diagnosis as for example in AFB positive chronic granulomatous lymphadenopathy and metastasis from a known primary site. In developing countries like ours with limited resources, FNAC carries a huge advantage for the evaluation of lymphadenopathy.

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