

# Evaluation of Lymphadenopathy using FNAC as a Diagnostic Tool

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## ABSTRACT

**Introduction:** Fine needle aspiration cytology (FNAC) is a simple, economical and relatively accurate procedure for initial diagnosis of all superficial lumps. It plays an important role as an early investigation in the management of patients with lymphadenopathy. This study was aimed to evaluate the role of FNAC in patients presenting with lymphadenopathy.

**Material and methods:** The Present study was conducted in the Cytology section of the Postgraduate Department of Pathology, Govt. Medical College Jammu over a period of 1 year. Patients presenting with superficial palpable lymph nodes were included in study. Material was aspirated with 22 gauge needle and smears were prepared. Smears obtained were stained by May-Grunwald-Giemsa and Papanicolaou methods and examined.

**Results:** The most common cause of lymphadenopathy in males was found to be reactive lymphadenitis (37.93%) followed by tuberculous lymphadenitis (27.59%). In females most common cause of lymphadenopathy was found to be tuberculous lymphadenitis (38.09%) followed by reactive lymphadenitis (35.71%). In the elderly age group (> 45 years), metastatic carcinoma was found to be most common cause of lymphadenopathy (43.33%).

**Conclusion:** Fine Needle Aspiration Cytology (FNAC) is a useful initial diagnostic tool in evaluating lymphadenopathy. It is a simple, accurate, rapid and effective method with minimum complications.

**Keywords.** FNAC, Lymphadenopathy, Lymphadenitis, Lymphoma

## INTRODUCTION

FNAC of lymph node has become an integral part of the initial diagnosis and management of patients with lymphadenopathy due to early availability of results, simplicity and minimal trauma with less complication.<sup>1</sup> 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.<sup>2</sup> It almost offers an accurate diagnoses of various pathologies including reactive lymphadenitis/inflammatory conditions, granulomatous disorders, lymphoma and metastasis, stratifying cases requiring further investigations, surgical intervention or clinical followup.<sup>3</sup>

Thus, it can avoid the need for excisional biopsy in most cases and allow rapid onset of therapy.<sup>4</sup> FNAC has been practised successfully for the diagnosis of superficial and deep lesions. During last decade great increase in the use of aspiration biopsy and cytology has been brought about by simplicity, low cost of procedure and almost immediate availability of results.<sup>5</sup>

FNAC of lymph nodes is particularly useful for the

documentation of metastatic carcinoma. It is most often used in cervical lymph nodes<sup>6</sup> but also in other locations including intra-abdominal and retroperitoneal regions.<sup>7</sup>

## MATERIAL AND METHODS

The Present study was conducted in the Cytology section of the Postgraduate Department of Pathology, Govt. Medical College Jammu over a period of 1 year.

All patients presenting with superficial palpable lymph node swellings of size more than 0.5 cm were included in the study. Deep seated, non-palpable lymph nodes and lymph nodes with size less than 0.5 cm were excluded from the study. History and clinical examination was taken as per the proforma.

## Method

With the patient in comfortable position the lesion was grasped with two fingers of one hand and prepared by applying an antiseptic solution. A 22 gauge Needle attached to the syringe holder was advanced into the center of the lump using quick smooth motion. The suction was applied by pulling the piston at least 1/3<sup>rd</sup> of the total length of the syringe. With the suction held steady, the needle was moved back and forth within the lump using short quick strokes. When the specimen appeared at the junction of needle and tip of the syringe, vacuum was created and allowed to return to normal slowly. The Needle was withdrawn gently and immediate pressure was applied to the puncture site with a sterile gauze pad. Syringe was filled with air after removing the needle and sample was expressed onto the slide after reattaching the needle.

The best of the slides were chosen for staining. The staining was done by Papanicolaou stain and May-Grunwald-Giemsa (MGG). For Papanicolaou staining<sup>8</sup>, smears were wet fixed in isopropyl alcohol. For May-Grunwald-Giemsa (MGG)<sup>9</sup> staining, smears were air dried.

## RESULTS

The present study included a total no. of 100 patients. The age group involved ranged from 1 year to 90 years. The mean age of the patients was found to be 32.55 years. Cases were distributed in 3 age groups- pediatric (0-14 years), young adults and adult (15-45 years), and elderly (> 45

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Age in years	Most common		Second common		Significant		Total
0-14	Reactive lymphadenitis	15	Tuberculous lymphadenitis	08	Hodgkins Lymphoma		29
15-45	Tuberculous lymphadenitis	15	Reactive lymphadenitis	19			41
>45	Reactive lymphadenitis	07	Tuberculous lymphadenitis	05	Metastatic	13	30

Table-1: Depicting causes of lymphadenopathy age wise distribution

Distribution based on causes		Male		Female		Total (%)
Cytological diagnosis		No.	%	No.	%	(%)
Reactive hyperplasia		22	22	15	15	37
Tuberculous lymphadenitis		16	16	16	16	32
Suppurative Lymphadenitis		1	1	3	3	4
Secondary deposits	Squamous cell carcinomatous deposits	7	7	2	2	9
	Adeno-carcinomatous deposits	1	1	2	2	3
	Poorly Differentiated Carcinomatous deposits	2	2	1	1	3
	Leukemic Infiltration	1	1	1	1	2
Non-Hodgkin lymphoma		4	4	1	1	5
Hodgkin lymphoma		4	4	1	1	5
Grand Total		58	58	42	42	100

Table-2: Depicting the cause of lymphadenopathy sex wise distribution

Lymph node involved	Benign	Malignant
100	71	29

Table-3: Showing distribution of cases as benign and malignant

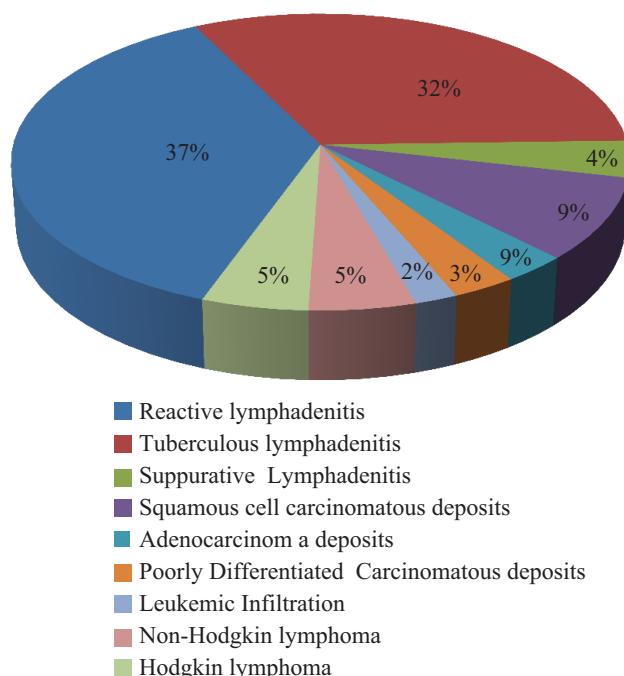


Figure-1: Pie Chart Showing Percentage distribution of 100 cases on the basis of cause of Lymphadenopathy

years). Most of the patients (41%) belonged to the age group 15-45 years. Tuberculous lymphadenitis was found to be the most common cause of lymphadenopathy in this age group (46.34%) followed by reactive lymphadenitis (36.58%). 3 out of 5 cases (60%) of Hodgkin's lymphoma belonged to this age group. In the pediatric age group (0-14 years), the most common cause of lymphadenopathy was found to be

reactive lymphadenitis (51.72%) followed by tuberculous lymphadenitis (27.59%). In the elderly age group (> 45 years), metastatic carcinoma was found to be most common cause of lymphadenopathy (43.33%). Out of 5 cases of Non Hodgkin's lymphoma 4 i.e. 80% belonged to this age group. Table 1

In 100 cases reported, 58 were males and 42 were females. The most common cause of lymphadenopathy in males was found to be reactive hyperplasia (37.93%) followed by tuberculous lymphadenitis (27.59%). Similarly in females most common cause of lymphadenopathy was found to be tuberculous lymphadenitis (38.09%) followed by reactive hyperplasia (35.71%). Out of 17 secondary metastatic cases 11 were males and 6 were females. Table 2

Out of 100 cases, 71 cases were reported as benign while 29 were reported as malignant. Among these 50 cases presented with involvement of single lymph node. The most common site of involvement was cervical lymph nodes comprising majority (32) of the cases. Table 3

The distribution of 100 cases according to the cause of the lymphadenopathy is shown in fig 5; 37 cases reported as reactive lymphadenitis, 32 as tubercular lymphadenitis, 4 as suppurative lymphadenitis, and 17 as metastatic while 5 cases as Hodgkin's lymphoma and 5 cases as Non-Hodgkin's lymphoma. Figure 1 and Table III shows distribution of 100 cases according to the cause of the Lymphadenopathy.

## DISCUSSION

Fine needle aspiration cytology (FNAC) offers clear advantages. It is minimally invasive, produces a speedy result and is inexpensive.<sup>10</sup> Enlarged lymph nodes are a prime target for fine needle aspiration. It is accepted by most patients as a non-invasive method of lymph node aspiration.<sup>11</sup>

The age of the patients ranged from 1 to 90 years. Majority of the patients (41 out of 100 i.e. 41%) belonged to the age

group of young adults and adults (15-45 years). Tuberculous lymphadenitis was found to be the most common cause of lymphadenopathy in this age group (19 out of 41 i.e. 46.34%). This is comparable with the findings of Agarwal et al.,<sup>12</sup> where majority of the patients (47.4%) belonged to this age group and the most common cause of lymphadenopathy was tuberculous lymphadenopathy (40.78%). Present study depicted reactive hyperplasia (51.72%) as most common cause of lymphadenopathy in the pediatric age group (0-14 years). This is comparable to findings of Moore et al.,<sup>13</sup> who reported reactive hyperplasia as the most common cause of lymphadenopathy (47.80%) in the pediatric age group (0-14 years.). Agarwal et al.,<sup>12</sup> also reported reactive hyperplasia as the most common cause of lymphadenopathy in children (70.88%). Similar findings were reported by Bharathi et al.,<sup>14</sup> who observed infections and reactive lymphadenopathy as common cause in younger patients. In the elderly age group (>45 years), metastatic carcinoma was found to be a significant cause of lymphadenopathy (43.33%). This is comparable with the findings of Agarwal et al.,<sup>12</sup> where metastatic carcinoma was found to be in 52.24%.<sup>12</sup> Bharathi et al., also reported that lymphadenopathy in older patients was mainly because of metastatic malignancy (42%).<sup>14</sup>

In the present study, out of 100 cases 58 were males and 42 were females. The M: F (male: female) ratio was 1.38:1. The most common cause of lymphadenopathy in males was found to be reactive hyperplasia. The most common cause of lymphadenopathy in females was found to be tuberculous lymphadenitis. This is consistent with the findings of Kochhar et al. who reported reactive hyperplasia and tuberculous lymphadenitis as the most common cause of lymphadenopathy in males and females respectively.<sup>15</sup>

This study presented majority of patients with localised lymphadenopathy i.e. 74% while only 26% patients presented with generalised lymphadenopathy. Similar findings were reported by Ferrer where patients with localised lymphadenopathy comprised of 75%<sup>16</sup> and generalised lymphadenopathy as 25% of the total cases. Williamson also reported similar findings.<sup>17</sup>

The most common site of involvement was cervical lymph nodes. This was similar to the findings reported by Agarwal et al., who found cervical lymph node as the most common site of involvement.<sup>12</sup> Sumyra et al., presented similar reports where cervical lymph node was shown as the most common site (1201 out of 1579 i.e. 76%) of involvement.<sup>18</sup>

In present study, out of 100 cases 37 cases were reported as reactive lymphadenitis, 32 cases as tuberculous lymphadenitis, 4 cases as suppurative lymphadenitis, 17 cases as metastatic while 5 cases as Hodgkin's lymphoma and 5 cases as Non-Hodgkin's lymphoma. Ruchi et al., studied 656 patients of lymphadenopathy and found that the most common cause of lymphadenopathy was tuberculous lymphadenitis (52.3%) followed by reactive lymphadenitis (37.2%), metastatic carcinoma (3.8%), lymphoma (2%) and pyogenic lymphadenitis (1%).<sup>19</sup> The results showed slight variations with reactive lymphadenitis (37%) as the most common cause in present study compared to the findings

reported by Ruchi et al., where tuberculous lymphadenitis (52.3%) was found as the most common cause. Similar findings were reported by Bharathi et al., who observed tuberculous lymphadenitis (30%) as the most common cause of lymphadenopathy followed by reactive lymph nodes (28%), squamous cell carcinoma deposits (22%), adenocarcinoma deposits (19%) and lymphoma (1%).<sup>14</sup> Sumyra et al., (2012) studied similar cases of lymphadenopathy and reported metastatic malignancy (38.2%) as the single most common cause of lymphadenopathy.<sup>18</sup> The next common causes were reactive lymphoid hyperplasia (36.9%) and tuberculous lymphadenopathy (9.1%). These variations may be due to large sample size, age of the patients, place and duration of the study, local genetic and environmental factor.

## CONCLUSION

Fine Needle Aspiration Cytology (FNAC) is an important initial diagnostic tool in evaluating various causes of lymphadenopathies. It is a simple, accurate, rapid and effective method with least number of complications. The most common lymphadenopathies are due to benign conditions. However, a significant number of Lymph node enlargements are due to malignancies- metastatic or lymphomas. FNAC plays an important role in distinguishing cases that need further evaluation. Benign conditions like reactive lymphadenitis can be accurately diagnosed by FNAC and need no further intervention. FNAC is a valuable tool in evaluation of patients with tuberculous lymphadenitis. FNAC is highly accurate method in patients presenting with metastatic lymph nodes. It may help to detect occult primaries.

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