

Spectrum of Cytopathological Causes of Cervical Lymphadenopathy- An Experience at Sahiwal Teaching Hospital

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ABSTRACT:

Objective: Cervical lymph nodes are very often enlarged in many diseases. Fine Needle Aspiration Cytology (FNAC) is a simple, fast, and affordable procedure for diagnosing enlarged lymph nodes with a great degree of precision. It is the gold standard biopsy technique used in the workup of palpable neck masses, having sensitivity and specificity as high as 97%. The objective of our study was to determine the most common cause of cervical lymphadenopathy.

Methodology: Results of FNAC done in Sahiwal Medical College, Sahiwal were retrospectively analyzed from January 2023 to December 2023 after approval from the ethical review board of the institute to determine the most common etiology of cervical lymphadenopathy in our region. Patients from both the genders and of all ages were included in the study.

Results: According to the results of our study, granulomatous inflammation, most likely Tuberculosis, turned out to be the most common etiology of cervical lymphadenopathy followed by reactive lymphoid hyperplasia. The least common cause of cervical lymphadenopathy appeared to be Hodgkin's lymphoma and malignant cells that appeared in equal ratios.

Conclusion: FNAC helped us in determining granulomatous inflammation, most likely Tuberculosis as the most common cause of cervical lymphadenopathy which is consistent with data obtained from most developing countries.

KEYWORDS: Fine Needle Aspiration Cytology, Cervical lymphadenopathy, Tuberculosis

INTRODUCTION

Lymph nodes of the immune system are distributed throughout the body. They are oval-shaped organs and are linked by lymphatic vessels. There are

approximately 600 lymph nodes in the human body, with around 60 to 70 located in the head and neck region, which can be affected by various abnormalities. Any abnormality in size, consistency, and number of lymph nodes is defined as lymphadenopathy and can be caused when inflammatory or neoplastic cells invade or propagate into the lymph node. Malignancies, infections, autoimmune diseases, iatrogenic and miscellaneous conditions are considered to be some of the causes of cervical lymphadenopathy.¹ Cervical lymph node is considered to be enlarged when its size increases more than 1cm. It is very important to diagnose the cause of cervical lymphadenopathy in order to decide the right treatment modality.

Many options are available for diagnosing the exact cause of cervical lymphadenopathy and Fine

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Needle Aspiration Cytology (FNAC) is one of them.² It is being used widely across the world as a diagnostic tool for the triage of palpable masses, especially peripheral lymphadenopathy when performed by a trained professional. It is a safe process with the least invasion and excellent diagnostic yield.³ The gold-standard biopsy modality in the workup of a neck mass is fine-needle aspiration (FNA). FNAC should be performed as a protocol procedure before open procedures and can be used for cytology and culture, particularly when an infectious neck mass does not respond to conventional antibiotic therapy. It has a sensitivity and specificity of 97% after the diagnostic material is collected for diagnosing the adult and pediatric masses of the head and the neck.⁴

Like head and neck masses, being simple, FNAC is also useful for diagnosis of metastatic tumors in the lymph nodes. No other tool has yet been used for such purpose in order to save crucial time and being highly reliable. Hence, it can help in the detection of occult primary malignancies.⁵ However, the high occurrence of HIV infections brings a different opinion into a differential diagnosis for certain patients for which further diagnostic examination is required.^{6,7} The objective of our study is to determine the most common cause of cervical lymphadenopathy.

METHODOLOGY

This retrospective study was conducted at the Department of Pathology in Sahiwal Medical College, Sahiwal from January 2023 to December 2023 after approval from the Ethical Review board of the institute vide no. 85/IRB/SLMC /SWL. The data was collected from the previous medical records and reports available in the archives of the Pathology department. Patients of both sexes and all age groups with enlarged cervical lymph nodes were included in the study. Those patients having other neck swellings as well such as enlarged thyroid and salivary glands, any evident signs of malignancy on radiological imaging or taking medications for lymphadenopathy were excluded

from the study. Samples of cervical lymph nodes were aspirated between 1 and 3 times using a 21-G needle after taking proper informed consent from patients. This aspirate was then used to prepare the smears on slides for the microscopic examination. The air-dried smears from each case were stained with Giemsa and Papanicolaou stain was used for smears fixed with alcohol. The slides were then observed under the microscope and the cause was reported accordingly. Afterward, the data was entered and analyzed using Statistical Package for Social Sciences version 24.0 for windows.

RESULTS

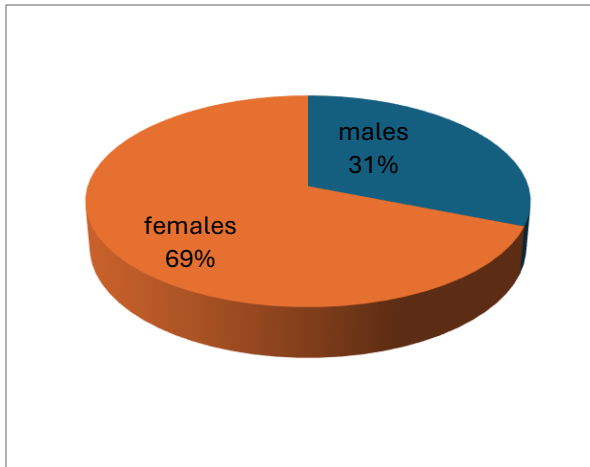
The results of total 93 FNACs of Cervical Lymph Nodes done in Sahiwal Medical College, Sahiwal were studied to determine the most common cause of cervical lymphadenopathies. The demography of the study includes 64 (69%) females and 29 (31%) males out of 93 cases (Figure 1).

Table 1: Age group for male gender

DIAGNOSIS	<10	10-20	21-30	31-40	41-50	51-60	61-70	71-80	Total
Necrotizing granulomatous Inflammation most likely Tuberculosis	1	4	5	0	1	1	0	2	14
Reactive lymphoid hyperplasia	2	1	1	1	0	0	0	0	5
Acute suppurative lymphadenitis	1	0	1	1	1	0	0	1	5
Negative for Malignancy	0	1	1	0	0	0	0	0	2
Positive for Malignancy	0	0	0	0	0	1	0	0	1
Lymphoproliferative disorder consistent with Hodgkin's lymphoma	0	0	0	1	0	0	0	0	1
Lymphoproliferative disorder consistent with non-Hodgkin's lymphoma	0	1	0	0	0	0	0	0	1
Total	4	7	8	3	2	2	0	3	29

The minimum age is 2 years while the maximum age is 90 years. The mean age is 28.0323 with a standard deviation of 17.60833. The largest cluster was observed in the age group of 30 (Tables 1, 2)

Figure 1: Distribution According to Gender



Out of 93 cases, the different diagnoses that were obtained are shown in Table 3 with their respective percentages and also distribution shown according to genders in Table 4.

Table 2: Age group for female gender

DIAGNOSIS	< 10	10	21	31	41	51	61	81	Total
		- 20	- 30	- 40	- 50	- 60	- 70	- 90	
Necrotizing granulomatous Inflammation most likely Tuberculosis	3	14	11	3	2	1	1	1	36
Reactive lymphoid hyperplasia	0	3	5	2	4	0	0	0	14
Acute suppurative lymphadenitis	1	3	1	2	0	0	0	0	7
Negative for Malignancy	0	0	1	1	1	0	0	0	3
Lymphoproliferative disorder consistent with Non-Hodgkin's lymphoma	1	0	0	0	0	1	0	0	2
Lymphoproliferative disorder consistent with Hodgkin's lymphoma	0	1	0	0	0	0	0	0	1
Positive for Malignancy	0	0	1	0	0	0	0	0	1
Total	5	21	19	8	7	2	1	1	64

As evident from data, Necrotizing Granulomatous Inflammation (most likely Tuberculosis) is the most common cause of cervical lymphadenopathy with the prevalence of 50 cases out of 93 (53.76%) in both genders, and Reactive Lymphoid Hyperplasia being the second most common cause i.e., 19 cases out of 93 (20.4%). The least common

Table 3: Frequency of diagnosis of cervical lymphadenopathy FNAC

	N	PERCENTAGE
Necrotizing granulomatous Inflammation most likely Tuberculosis	50	53.76%
Reactive lymphoid hyperplasia	19	20.4%
Acute suppurative Lymphadenitis	12	12.9%
Negative for malignancy	5	5.4%
Lymphoproliferative disorder consistent with non-Hodgkin's lymphoma	3	3.2%
Proliferative disorder consistent with Hodgkin's lymphoma	2	2.2%
Positive for malignancy	2	2.2%

cause of cervical lymphadenopathy is Hodgkin's lymphoma with only 2 cases (2.2%) (Table 4).

Table 4: Cross tab analysis of diagnosis of gender distributions

DIAGNOSIS	MALES		FEMALES	
	N	%	N	%
Necrotizing granulomatous Inflammation most likely Tuberculosis	14	48.27	36	56.25
Reactive lymphoid hyperplasia	5	17.24	14	21.9
Acute suppurative lymphadenitis	5	17.24	7	10.93
Negative for malignancy	2	6.90	3	4.68
Lymphoproliferative disorder consistent with Non-Hodgkin's lymphoma	1	3.45	2	3.12
Lymphoproliferative disorder consistent with Hodgkin's lymphoma	1	3.45	1	1.56
Positive for malignancy	1	3.45	1	1.56
TOTAL	29	31	64	69

DISCUSSION

Most common type of lymphadenopathy is cervical lymphadenopathy. The enlargement of cervical lymph nodes may be due to any infection, autoimmune disease, malignancy or any iatrogenic disease.⁸ FNAC, being a simple, quick, inexpensive and minimally invasive OPD technique, is used for the etiology of cervical lymphadenopathy.⁹

This study was conducted to determine the most common cause of cervical lymphadenopathy. In our study, female predominance was seen with 64 (68.81%) out of total of 93 cases with maximum cases occurring in the age group of 21-30 years

which is in accordance with the study done by Mani et al.¹⁰ but in another study done by Bhatta et al., a slight male predominance was seen, with most cases seen between ages of 21-40 years.¹¹ In our study the most common cause of cervical lymphadenopathy was necrotizing granulomatous inflammation most likely due to tuberculosis, which accounts for approximately more than half of the total cases as determined by our FNAC results (53.7%). The results are also consistent with the studies conducted for the region where TB is considered to be the most common case.^{10,11,12} According to several other studies, TB is the most likely etiology of cervical lymphadenopathy in developing countries since the disease itself is common in these regions.¹³ This finding is also consistent with the fact that TB is a major health concern in Pakistan, with 43,900 deaths attributed to the disease and thousands of new cases each year, including 570,000 cases in 2019 alone — accounting for two thirds of the global incidence that year.¹⁴ This results in making tuberculosis, the most common cause of cervical lymphadenopathy in our region. According to the result of our study, tuberculosis cervical lymphadenopathy is less prevalent after age 40 with only 8 cases (17.39%) as compared to people below 40 years with 38 cases (82.6%). This finding is consistent with a study conducted in Nigeria by Olu-Eddo AN et al.¹⁵ However, in another study done by Chawla et al there was a lower incidence of tuberculous lymphadenopathy (31.7%).¹⁶ The reason behind this higher incidence may also be due to the fact that a large population from lower socio-economic status is getting treated by our tertiary care hospital. It was followed by reactive lymphoid hyperplasia (20.4%), acute suppurative lymphadenitis (12.9%), lymphoproliferative disorders (5.4%) and metastatic deposits (2.2%). This is in accordance with the studies done by Malhotra et al and Dharmalingam et al.^{17,18} Regarding age groups of these lesions, reactive lymphoid hyperplasia was common in the age group of 21-30 years which is also in accordance with the study done by Anwar et

al and Shameema et al.^{12,19} In our study, lymphoproliferative disorders accounted for 5.4% of the total cases, occurring in the age groups under 10 and 21-30. In contrast, the study by Shakera et al. found the incidence of these disorders primarily in those aged 40 and above, comprising 36.8% of the total cases.²⁰

CONCLUSION

In addition to its role in tissue diagnosis, FNAC also works as a screening method for various clinical conditions such as lymphoma, reactive lymphadenitis, tubercular lymphadenitis, and metastatic lesions. It helped us in determining the most common cause of cervical lymphadenopathy which is consistent with data obtained from most developing countries. Tuberculosis is the leading cause of cervical lymphadenopathy in our region. It is followed by reactive lymphoid hyperplasia which is the second leading cause in our region. It is followed by acute suppurative lymphadenitis. According to our study, lymphomas are the least commonly occurring etiologies of cervical lymphadenopathies which is contradictory to studies conducted in developing countries. This may be due to the limited data. All other data is consistent with common etiologies in developing countries.

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Author Contributions:

Raees Abbas Lail: conceived the study designed, carried out the data collection and statistical analysis and drafted the manuscripts.

Areeba Farooq: Participated in its design and coordination. drafted, read and approved the final manuscript.

Qurrat-ul-Ain Tahir: Participated in its design and coordination. Statistical analysis, drafted, read and approved the final manuscript.

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Sadaf Shafique: Participated in its design and coordination. Statistical analysis, drafted, read and approved the final manuscript.

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