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Original Article

Clinical Profile, Management, and Prognosis of Cervical Lymphadenopathy: A Study of 60 Patients at a District-Level Hospital

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ABSTRACT

Background: Cervical lymphadenopathy has diverse infectious, inflammatory, and malignant causes, with tuberculosis remaining an important etiology in Bangladesh. Persistent or hard lymph nodes may indicate malignancy and require further evaluation. However, district-level evidence remains limited. This study evaluated the clinical profile, etiological patterns, management, and short-term outcomes of patients with cervical lymphadenopathy. **Methods & Materials:** A hospital-based observational study was conducted among 60 patients with cervical lymphadenopathy at Jamalpur Medical College Hospital from March 2025 to February 2026. Demographic and clinical data were collected, and diagnosis was established through clinical examination, ultrasonography, FNAC, biopsy, and relevant investigations. Management and short-term outcomes were assessed. Data were analyzed using SPSS version 26.0, with $p<0.05$ considered significant. **Results:** In a group of 60 patients, the average age was 36.8 ± 17.2 years, with a higher percentage of males (56.7%); 63.3% hailed from rural regions. Neck swelling occurred in all cases (100%), followed by fever (51.7%) and pain/tenderness (33.3%). The majority exhibited unilateral (66.7%) and firm (51.7%) lymphadenopathy, with 48.3% ranging from 2 to 4 cm. FNAC was conducted in 86.7% of individuals. Tuberculous lymphadenitis was the most common diagnosis (35.0%), succeeded by reactive/infective lymphadenitis (26.7%) and malignancy (28.4%). The most prevalent treatment was anti-tubercular therapy (35.0%). Malignancy showed a significant correlation with age over 40 years ($p=0.002$), weight reduction ($p=0.004$), and firm lymph-node texture ($p<0.001$). **Conclusion:** Tuberculosis was the leading cause of cervical lymphadenopathy, while older age, weight loss, and hard lymph nodes were significantly associated with malignancy. Early FNAC or biopsy is essential for accurate diagnosis and appropriate management.

Keywords: *Cervical Lymphadenopathy, Clinical Profile, Management, Prognosis, FNAC, Tuberculous lymphadenitis.*

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INTRODUCTION

Cervical lymphadenopathy (CLA) refers to cervical lymph nodes >1 cm in diameter and is a common clinical sign, usually caused by benign, self-limiting conditions but potentially indicating infection, systemic disease, or malignancy [1,2]. Potential factors encompass infectious, immunological, neoplastic (either primary or secondary), and metabolic disorders, varying from benign self-limiting issues to severe systemic illnesses [3].

In Bangladesh, where tuberculosis is a major public health issue, cervical tuberculous lymphadenitis is a key contributor to cervical lymphadenopathy [4]. Neoplastic cervical lymphadenopathy comprises lymphoma as well as metastatic tumors from the upper aerodigestive tract, thyroid, and salivary glands. Malignancy is more probable with persistent, solid, immovable, painless, or growing nodes, especially in elderly men and those experiencing weight loss, fever, night sweats, a history of smoking, or supraclavicular involvement [5,6].

The precise frequency of lymphadenopathy is unclear, with documented rates between 38–45%. In tropical areas, tuberculosis frequently occurs, and the rise of HIV co-infection has led to more cases of extrapulmonary TB. Malignancy occurs in 0.4% of patients younger than 40 years and 4% of patients older than 40 years in primary care settings [7,8].

Cervical lymphadenopathy typically manifests as swelling in one or both sides of the neck. Infectious nodes are generally soft, mobile, and tender, whereas malignant nodes are usually painless, hard, immobile, and progressively increasing in size. Tuberculous nodes can be persistent and entangled, potentially exhibiting necrosis or sinus development. Fever, night sweats, weight reduction, difficulty swallowing, and a raspy voice may present, while supraclavicular or ongoing nodes require additional assessment [9-11].

Accurate identification of cervical lymphadenopathy frequently poses a significant difficulty. Assessing cervical lymphadenopathy can be difficult because of similar clinical characteristics. A complete medical history and physical assessment, along with laboratory testing, imaging studies, and tissue analysis, are necessary. Fine-needle aspiration or excisional biopsy continues to be the benchmark for a conclusive diagnosis [8,12]. Management is specific to the cause: infections necessitate suitable antimicrobials, tuberculosis demands anti-tubercular therapy, and persistent or questionable nodes need imaging and FNAC/biopsy. Cancers are managed based on the type and stage of the tumor using surgery, radiation therapy, chemotherapy, or systemic treatments [9,13].

Worldwide research shows that cervical lymphadenopathy has various infectious, inflammatory, and neoplastic origins. Recent findings highlight the importance of thorough clinical assessment, suitable imaging, and tissue diagnosis to identify the root cause, direct effective treatment, and enhance clinical results [2,8]. Research conducted in Bangladesh indicated a wide range of cervical lymphadenopathy, with tuberculosis and various infectious origins being the most common, in addition to reactive and malignant disorders, underscoring the necessity of clinical and pathological assessment [14,15,16].

Nonetheless, extensive information regarding clinical traits, management strategies, treatment results, and prognostic elements is still scarce, highlighting the necessity for additional research in the Bangladeshi demographic. The aim of this study was to evaluate the clinical profile,

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etiological patterns, management approaches, and short-term outcomes of patients presenting with cervical lymphadenopathy at a district-level hospital.

METHODS & MATERIALS

Study Design and Setting

This hospital-based observational study was conducted in the Department of Otolaryngology–Head and Neck Surgery, Jamalpur Medical College Hospital, Jamalpur, Bangladesh, from March 2025 to February 2026. The study included patients presenting with cervical lymphadenopathy during the study period.

Study Population and Sampling

A total of 60 consecutive patients with clinically palpable cervical lymphadenopathy were enrolled. Patients of any age and sex were included. Patients with previously diagnosed cervical malignancy attending only for follow-up, incomplete clinical or diagnostic records, generalized lymphadenopathy without significant cervical involvement, or refusal to participate were excluded.

Data Collection

After obtaining informed consent, demographic and clinical data were collected using a structured questionnaire. Information regarding age, sex, residence, socioeconomic status, presenting symptoms, duration of lymphadenopathy, laterality, nodal site, size, consistency, tenderness, and matting was recorded. Relevant symptoms including fever, weight loss, night sweats, sore throat, cough, dysphagia, and loss of appetite were also documented. A detailed head and neck examination was performed for all patients.

Diagnostic Evaluation

All patients underwent appropriate clinical and laboratory evaluation. Ultrasonography of the neck was performed to assess lymph node characteristics. Fine-needle aspiration cytology (FNAC) was performed when indicated. Patients with inconclusive FNAC findings or clinical/radiological suspicion of malignancy underwent excision biopsy and histopathological examination. Additional investigations, including tuberculosis-related investigations and imaging for suspected primary malignancy, were performed when clinically indicated.

Final Diagnosis

The final diagnosis was established based on the combined findings of clinical examination, imaging, FNAC, histopathology, and relevant laboratory investigations. Patients were categorized as having tuberculous lymphadenitis, reactive/infective lymphadenitis, metastatic carcinoma, lymphoma, suppurative bacterial lymphadenitis, or other causes of cervical lymphadenopathy.

Management and Follow-up

Treatment was provided according to the final diagnosis. Patients with tuberculous lymphadenitis received standard anti-tubercular therapy, while those with infective lymphadenitis received appropriate antibiotics and supportive treatment. Patients with malignancy were managed surgically when indicated and/or referred to specialized oncology services for definitive treatment. Patients were followed clinically to assess response to treatment, persistence of lymphadenopathy, and need for further evaluation or referral.

Outcome Measures

The primary outcomes were the clinical profile, underlying causes, and management patterns of cervical lymphadenopathy. The secondary outcome was short-term treatment outcome, assessed by clinical improvement, persistence or progression of lymphadenopathy, and referral requirement during follow-up.

Statistical Analysis

Data were analyzed using IBM SPSS Statistics version 26.0. Continuous variables were expressed as mean ± standard deviation or median with interquartile range, while categorical variables were presented as frequencies and percentages. Associations between categorical variables were assessed using the Chi-square test or Fisher's exact test, as appropriate. A p-value <0.05 was considered statistically significant.

Ethical Considerations

Ethical approval was obtained from the appropriate institutional authority. Written informed consent was obtained from participants or their legal guardians where applicable. Patient confidentiality was maintained throughout the study.

RESULTS

Sociodemographic Characteristics

Table I shows total of 60 patients with cervical lymphadenopathy were included in the study. The mean age of the participants was 36.8 ± 17.2 years, with an age range of 5–78 years. The largest proportion of patients belonged to the 21–40 years age group (36.7%), followed by 41–60 years (26.7%). Males constituted 56.7% of the study population, with a male-to-female ratio of 1.3:1. Most participants were from rural areas (63.3%), and nearly half (48.3%) belonged to the lower socioeconomic group.

Table I
Sociodemographic characteristics of the study participants (n=60).

Variables	Frequency (n)	Percentage (%)
Age group (years)		
≤20	12	20.0
21–40	22	36.7
41–60	16	26.7
>60	10	16.6
Sex		
Male	34	56.7
Female	26	43.3
Residence		
Rural	38	63.3
Urban	22	36.7
Socioeconomic status		
Lower	29	48.3
Middle	25	41.7
Upper	6	10.0

Clinical Presentation

Table II shows neck swelling was the predominant presenting complaint and was reported by all participants. Other common symptoms included fever (51.7%), pain or tenderness (33.3%), weight loss (30.0%), night sweats (25.0%), sore throat (23.3%), cough (18.3%), and loss of appetite (26.7%). Dysphagia was reported by 11.7% of patients.

Table II
Clinical characteristics of the patients (*n*=60).

Clinical characteristics	Frequency (n)	Percentage (%)
Neck swelling	60	100.0
Fever	31	51.7
Weight loss	18	30.0
Night sweats	15	25.0
Dysphagia	7	11.7
Sore throat	14	23.3
Cough	11	18.3
Pain/tenderness	20	33.3
Loss of appetite	16	26.7

Characteristics of Cervical Lymphadenopathy

Table III presents nearly half of the patients (46.7%) presented within one month of noticing the cervical swelling, while 30.0% had symptoms for more than one to three months and 23.3% had symptoms for more than three months. Unilateral lymphadenopathy was more common than bilateral involvement (66.7% vs. 33.3%). Most lymph nodes were firm in consistency (51.7%), followed by soft (26.7%) and hard (21.6%) nodes. Tenderness was present in one-third of the patients (33.3%), while nodal matting was observed in 23.3%. Regarding size, 48.3% of the lymph nodes measured 2–4 cm, whereas 11.7% were larger than 4 cm.

Table III
Characteristics of cervical lymphadenopathy (*n*=60).

Characteristics	Frequency (n)	Percentage (%)
Duration		
≤1 month	28	46.7
>1–3 months	18	30.0
>3 months	14	23.3
Laterality		
Unilateral	40	66.7
Bilateral	20	33.3
Consistency		
Soft	16	26.7
Firm	31	51.7
Hard	13	21.6
Tenderness		
Present	20	33.3
Absent	40	66.7
Matting		
Present	14	23.3
Absent	46	76.7
Nodal size		
<2 cm	24	40.0
2–4 cm	29	48.3
>4 cm	7	11.7

Diagnostic Evaluation and Final Diagnosis

Table IV shows ultrasonography of the neck showed reactive lymph nodes in 28.3% of patients, necrotic or caseating nodes in 30.0%, enlarged solid nodes suspicious for malignancy in 21.7%, and multiple enlarged nodes without specific features in 20.0%. FNAC was performed in 52 (86.7%) patients, whereas 8 (13.3%) underwent excision biopsy because of inconclusive cytological findings or clinical suspicion of malignancy.

Based on the final diagnosis, tuberculous lymphadenitis was the most common cause, accounting for 35.0% of cases, followed by reactive/infective lymphadenitis (26.7%). Malignant lymphadenopathy accounted for 28.4% of cases, comprising metastatic carcinoma (16.7%) and lymphoma (11.7%). Suppurative bacterial lymphadenitis and other causes accounted for 6.6% and 3.3% of cases, respectively.

Table IV
Diagnostic evaluation and final diagnosis (*n*=60).

Diagnostic/final diagnosis	Frequency (n)	Percentage (%)
Initial FNAC findings		
Reactive lymphadenitis	17	28.3
Granulomatous lymphadenitis	16	26.7
Suppurative lymphadenitis	8	13.3
Suspicious/malignant cells	11	18.3
Inconclusive	8	13.4
Final diagnosis		
Tuberculous lymphadenitis	21	35.0
Reactive/infective lymphadenitis	16	26.7
Metastatic carcinoma	10	16.7
Lymphoma	7	11.7
Suppurative bacterial lymphadenitis	4	6.6
Other causes	2	3.3

Management of Patients
Table V shows management was guided by the final diagnosis and clinical status of the patients. Anti-tubercular therapy was prescribed to 35.0% of patients, while 33.3% received antibiotics and supportive treatment for infective lymphadenitis. Chemotherapy was administered to 11.7% of patients diagnosed with lymphoma or other malignancies. Surgical excision or neck dissection was performed in 13.3% of cases, mainly for diagnostic purposes or management of suspicious/persistent lymphadenopathy. Four patients (6.7%) were referred to higher-level oncology centers for definitive treatment.

Table V
Management received by the study participants (*n*=60).

Management	Frequency (n)	Percentage (%)
Anti-tubercular therapy	21	35.0
Antibiotics/supportive treatment	20	33.3
Chemotherapy	7	11.7
Surgical excision/dissection	8	13.3
Referral for oncology treatment	4	6.7

Factors Associated with Malignant Lymphadenopathy
Table VI shows the association between selected clinical characteristics and final diagnosis. Patients aged >40 years were significantly more likely to have malignant lymphadenopathy compared with younger patients (76.5% vs. 26.8%, p=0.002). Weight loss was also significantly more frequent among patients with malignant disease (58.8% vs. 17.1%, p=0.004). Hard consistency of lymph nodes showed a strong association with malignancy, being present in 52.9% of malignant cases compared with only 7.3% of tuberculous/infective cases (p<0.001). In contrast, night sweats, bilateral lymph node involvement, nodal matting, and nodal size >4 cm were not significantly associated with malignant pathology.

Table VI
Association between final diagnosis and selected clinical features.

Clinical feature	Tuberculous/infective (n=41), n (%)	Malignant (n=17), n (%)	Other (n=2), n (%)	p-value
Age >40 years	11 (26.8)	13 (76.5)	1 (50.0)	0.002
Weight loss	7 (17.1)	10 (58.8)	1 (50.0)	0.004
Night sweats	12 (29.3)	3 (17.6)	0 (0.0)	0.342
Hard consistency	3 (7.3)	9 (52.9)	1 (50.0)	<0.001
Matting	12 (29.3)	2 (11.8)	0 (0.0)	0.189
Nodal size >4 cm	3 (7.3)	4 (23.5)	0 (0.0)	0.121
Bilateral involvement	16 (39.0)	4 (23.5)	0 (0.0)	0.269

Older age, weight loss, and hard lymph nodes were significantly more common among patients with malignant lymphadenopathy.

DISCUSSION

In this study, most patients were aged 21–40 years, with male predominance, 63.3% were from rural areas and 48.3% had lower socioeconomic status. This study is similar to a previous Bangladeshi study, where most patients were young adults. However, the previous study showed female predominance (82%), urban residence (64.67%), and middle socioeconomic status (55%), which differed from the present findings, possibly due to differences in study population and setting [17].

In this research, neck swelling was the predominant presenting symptom, succeeded by fever, pain/tenderness, weight loss, and night sweats. This research aligns with an earlier study conducted in Bangladesh, which identified generalized weakness (91.3%), weight loss (88.7%), appetite loss (85.2%), fever (78.3%), and cough (32.2%) as prevalent clinical characteristics [14]. The findings highlight the frequent occurrence of constitutional and respiratory symptoms among patients presenting with cervical lymphadenopathy [18].

In our study, the majority of patients arrived within one month of observing neck swelling, with unilateral involvement and firm consistency being the most common. Tenderness was observed in 33.3%, nodal matting in 23.3%, and the majority of lymph nodes were 2–4 cm. This research aligns with earlier Bangladeshi studies that indicated unilateral cervical lymphadenopathy and hardened lymph nodes as typical characteristics in cervical tuberculous lymphadenitis. Nodal matting and extended swelling were also often noted, highlighting the clinical significance of these characteristics in assessing cervical lymphadenopathy [17,19].

In this current study, FNAC was conducted in 86.7% of individuals, whereas 13.3% needed excision biopsy. The most common final diagnosis was tuberculous lymphadenitis, followed by reactive/infective lymphadenitis and malignant lymphadenopathy. This research resembles a recent prospective investigation where benign conditions were more prevalent, with tuberculosis identified as the most frequent diagnosis, whereas lymphoma was the primary malignant cause. FNAC has also been identified as a helpful preliminary diagnostic method, although biopsy continued to play a crucial role when cytological results were unclear or when cancer was suspected [20,21].

In our study, anti-tubercular therapy was the prevalent treatment, followed by antibiotics/supportive therapy, with 11.7% receiving chemotherapy and 13.3% having surgery. This research aligns with recent findings indicating that anti-tubercular treatment continues to be the cornerstone for cervical tuberculous lymphadenitis, yielding positive results after conventional therapy [22].

In this current study, advanced age, weight reduction, and firm lymph-node texture were significantly linked to malignant lymphadenopathy. This research aligns with earlier studies indicating that cervical tuberculous lymphadenitis is prevalent in younger individuals and can manifest with systemic symptoms and differing nodal consistency. Chronic, severe lymphadenopathy, especially in elderly patients experiencing weight loss, should thus generate concern for cancer and necessitate a tissue diagnosis. These results emphasize the significance of distinguishing malignant lymphadenopathy from tuberculous lymphadenitis in clinical assessment [17-19].

Overall, cervical lymphadenopathy was predominantly tuberculous/infective, while older age, weight loss, and hard lymph nodes were important clinical indicators of malignancy, emphasizing the need for timely FNAC or biopsy for accurate diagnosis.

CONCLUSION

Cervical lymphadenopathy was predominantly caused by tuberculosis and other infectious conditions, although malignancy accounted for a substantial proportion of cases. Older age, weight loss, and hard lymph-node consistency were significantly associated with malignancy. These findings highlight the need for careful clinical assessment to identify high-risk patients. Timely imaging, FNAC, or biopsy can facilitate early diagnosis and appropriate treatment, particularly in patients with suspicious clinical features.

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