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Clinico-Pathological and demographic profile of patients of cervical tubercular lymphadenitis in hilly region of Uttarakhand

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***Abstract*---**Tuberculosis (TB) is a communicable disease that is a major cause of ill health. The hilly region of Uttarakhand has difficult terrain and is one of the least accessible regions of the country. This present study was to evaluate the Clinico-pathological and demographic profile of patients of cervical tubercular lymphadenitis in hilly region of Uttarakhand, India. Detailed History and physical examination was to done and all previous investigations were compiled. Routine investigations like HIV, RBS and Chest X-Ray PA view, if not done earlier, were done of every patient. Lymph nodes were assessed according to system adopted by the American Academy of Otolaryngology Head and Neck Surgery. The age of the patients ranged from 14 to 64 years with a mean age of 35 years (SD=12.27). The commonest age group was 16-30 years (42.73%). Male: Female ratio was 1:1.34. Among 110 patients, 88 (80%) presented with solid

lymph nodes, 20 (18.2%) with abscess and 2 (1.8%) with discharging sinus. FNAC was done in all 110 cases and found AFB positive in 45 (40.9%) cases. Disease is relatively more common in younger patients. Constitutional symptoms were absent in some of the patients. FNAC has emerged as a rapid, inexpensive, simple, and effective method of diagnosis for cervical Tubercular lymphadenopathy.

***Keywords*---**cervical tuberculosis, lymphadenitis, clinico-pathological profile, demographic profile.

Introduction

Tuberculosis (TB) is a communicable disease that is a major cause of ill health, one of the top 10 causes of death worldwide and the leading cause of death from a single infectious agent. TB is caused by the bacillus *Mycobacterium tuberculosis*, which is spread when people who are sick with TB expel bacteria into the air; for example, by coughing. The disease typically affects the lungs (pulmonary TB) but can also affect other sites (extrapulmonary TB).(*GLOBAL TUBERCULOSIS REPORT 2021*, 2021). Lymph node TB (LNTB, also called TB lymphadenitis) refers to Mycobacterium tuberculosis infection of the lymph nodes, and may occur as the sole manifestation of TB infection, or alongside pulmonary or miliary TB. LNTB is the most common form of extrapulmonary TB in India, accounting for around 35% of EPTB cases.(Sharma and Mohan, 2009)

Nearly two-thirds of the lymph nodes in the body are located in the neck. There are various causes of cervical lymphadenitis. Enlargement of these lymph nodes is a reliable indicator of infection and cancer dissemination(Mili and Phookan, 2015). Tuberculosis is a major cause of cervical lymphadenitis, especially in India(Sharma and Mohan, 2009). Many studies have been done to assess the clinic-pathological and demographic profile of cervical lymphadenitis in various parts of the world(Maharjan *et al.*, 2009; Batni *et al.*, 2016). Few of these studies have focused only on Tubercular cervical lymphadenitis(Kamal *et al.*, 2016; Gupta and Bhake, 2017; Gautam *et al.*, 2018). The hilly region of Uttarakhand has difficult terrain and is one of the least accessible regions of the country. Assessing the clinical, pathological as well as demographic profile of Tuberculosis of cervical Lymph nodes in these otherwise neglected part of the world and comparing results with previous studies will help in better understanding of the disease. Objective of our study was to evaluate the Clinico-pathological and demographic profile of patients of cervical tubercular lymphadenitis in hilly region of Uttarakhand, India.

Material and Methods

This was a prospective observational study performed in HNB Base Hospital, Srinagar. Ethical Clearance was taken from the Institutional Ethical Committee (IEC) before initiating the study. All patients of cervical tubercular lymphadenitis (CTBL) attending the out-patient department (OPD) of TB and chest diseases, HNB Base Hospital were studied from July 2021 to November 2021.110Patients of Cervical Tubercular Lymphadenitis (CTBL) were selected on

clinical/microbiological basis. Informed consent was taken from each patient regarding the study, and patients who refused for study were excluded from the study. Detailed History and physical examination was done and all previous investigations were compiled. Routine investigations like HIV, RBS and Chest X-Ray PA view, if not done earlier, were done of every patient. For describing lymph nodes in the neck we used the system which originates from Memorial Sloan-Kettering Hospital, New York and adopted by the American Academy of Otolaryngology Head and Neck Surgery: Level I, Sub-mental and Sub-mandibular lymph nodes; Level II, Cervical jugular chain nodes above the level of hyoid; Level III, Cervical jugular chain nodes from the level of hyoid to the level of Cricoid; Level IV, Cervical jugular chain nodes from the level of Cricoid to the supra-sternal notch; Level V, Posterior triangle lymph nodes; Level VI, Central compartment nodes.(Faris, 2011)

Statistical analysis

Data were analyzed by Statistical Package for Social Sciences [SPSS version 20]. They were presented as table with percentage and proportion. Bivariate analysis with gender was done in some of the variables. Chi-square and fisher's exact test was done. P value was used to show the level of significance.

Observations

Total 110 patients of CTL were included in this study.

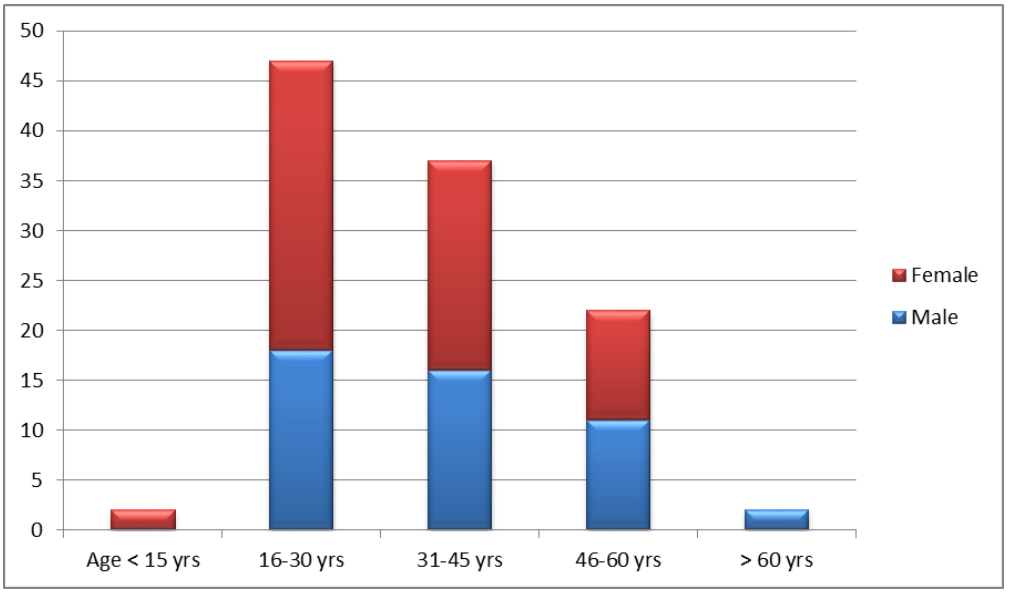

Figure 1. Age wise distribution of patients with cervical tubercular lymphadenitis

The age of the patients ranged from 14 to 64 years with a mean age of 35 years (SD=12.27). The commonest age group was 16-30 years (42.73%).

Table 1. Socio-demographic characteristics of the patients

Characteristics	No. (%)
Sex (n=110)	
Male	47 (42.73%)
Female	63 (57.27%)
Age (in years)	
< 15	2 (1.82%)
16-30	47 (42.73%)
31-45	37 (33.64%)
46-60	22 (20%)
>60	2 (1.82%)
Residence (n=110)	
Rural	53 (48.2%)
Semi-urban	18 (16.36%)
Urban	39 (35.45%)
Occupation (n=110)	
Housewife	38 (34.5%)
Student	24 (21.8%)
Business	13 (11.81%)
Day labour	9 (8.2%)
Healthcare worker (HCW)	8 (7.3%)
Unemployed	5 (4.5%)
History of TB exposure(n=110)	
Yes	24 (21.8%)
No	86 (78.2%)
Smoking status (n=110)	
Active smoker	24(21.8%)
Ex- smoker	1(0.9%)
Never smoker	85(77.3%)
Chi square and Fisher's exact test was applied	

Out of 110 patients, 63 (57.27%) were female and 47 male (42.73%). Male: Female ratio was 1:1.34. Patients were mostly housewives (34.5%). The other occupations include student 21.8% (24), business 11.81% (13), Labourer 8.2% (9), healthcare workers (HCW) 7.3% (8) and unemployed 4.5% (5). Almost half of the patients came from rural areas (48.2%). Previous history of TB exposure was found in 21.8% cases (24).

Table 2. Clinical characteristics of involved Lymph nodes	
Characteristics	No. (%)
Mode of presentation (N=110)	
Solid nodes	88 (80%)
Abscess	20 (18.2%)
Discharging sinus	2 (1.8%)
Number of enlarged lymph nodes (N=110)	
Single	31 (28.2%)
Multiple	79 (71.8%)
Matted	72.2% (57)
Discrete	27.8% (22)

Site of involvement (n=110)	
Unilateral	92 (83.6%)
Right	60 (65.2%)
Left	32 (34.8%)
Bilateral	18 (16.4%)
Size of involved nodes (n=110)	
<3 cm	27 (24.6%)
3-6 cm	81 (73.6%)
>6 cm	2 (1.8%)
Level of involvement (n=110)*	
Level I	4 (3.6%)
Level II	32 (29.1%)
Level III	47 (42.7%)
Level IV	19 (17.3%)
Level V	63 (57.3%)
Systemic features (n=75)*	
Fever	47 (62.7%)
Weight loss	51 (68%)
Night sweat	26 (34.7%)
Loss of appetite	57 (76%)
**Multivariate response*	
Chi square and Fisher's exact test was applied	

Among 110 patients, 88 (80%) presented with solid lymph nodes, 20 (18.2%) with abscess and 2 (1.8%) with discharging sinus. Unilateral involvement was found in 92 (83.6%) cases. Right side represented more (65.2%; 60) than left side (34.8%; 32).Multiple lymph nodes were found in 79 (71.8%) cases. Of them 72.2% (57) were matted and 27.8% (22) were discrete. Average number of cervical lymph nodes seen was 2.75, whereas average size of the largest cervical lymph node seen was 3.6 cm in diameter. Size of the largest lymph node was<3cm diameter in 22.7%, 3-6 cm in 73.6% and >6cm in 1.8% cases. Commonly involved lymph node group was level V (57.3%) followed by level III(42.7%) and level II (29.1%)Systemic features were found in 75(68.2%) cases. Fever (62.7%; 47), Weight loss (68%; 51), Night sweat (34.7%; 26) and Loss of appetite (76%; 57) were the common systemic features (Table-II). Site of involvement and number of enlarged lymph nodes were not varied significantly in respect to gender of the patients.

Table 3: Laboratory investigations of the patients	
Characteristics	No. (%)
FNAC (n=110)	
Positive for AFB	45 (40.9%)
Negative for AFB	65 (59.1%)
Epitheloid cells seen	69(62.7%)
Granuloma seen	68(61.8%)
Necrosis present	83(75.5%)
FNA CBNAAT (n=29)	
MTB not detected	18(62.1%)

MTB detected	11(37.9%)
R resistance detected	3(10.3%)
R resistance not detected	8(27.6%)
Chest Radiography (n=110)	
Suggestive of TB	15(13.6%)
Not suggestive of TB	95(86.4%)
Serum investigations (n=110)	
ESR >30mm/1st hour	73 (66.4%)
FBS >125 mg/Dl	2(1.8%)
FBS 110-125 mg/Dl	3(2.7%)
HIV Reactive	4(3.6%)
HIV Non-reactive	106(96.4%)

FNAC was done in all 110 cases and found AFB positive in 45 (40.9%) cases. Chest radiograph was done in all cases and was normal in 86.4% (95) cases. ESR was raised (>30mm/1st hour) in 66.36% (73) cases with a limit of 6-110 and mean was49 mm/1st hour (SD=30.32).

Discussions

From the day of discovery of Mycobacterium Tuberculosis on 24th March 1882 till today, Tuberculosis is a major health problem all over the world(Sakula, 1982).Globally in 2020, there were an estimated 1.3 million deaths among HIV-negative people, up from 1.2 million in 2019, and an additional 214,000 deaths among HIV-positive people, a small increase from 209,000 in 2019(*GLOBAL TUBERCULOSIS REPORT 2021*, 2021). India is among top 30 high TB burden, high HIV-associated TB burden and high MDR/RR-TB burden countries(*GLOBAL TUBERCULOSIS REPORT 2021*, 2021). Gender distribution of the patients (male:female;1:1.3) in this study was quite consistent with the study conducted by Ahmed I et al(Ahmed, 2013) in Pakistan (male:female;1:5), Jha BC et al(Jha *et al.*, 2001) in Chandigarh, India (male:female;1:1.3) and Kamal et al(Kamal *et al.*, 2016) in Bangladesh(male:female;1:2.1). Hence, in this study too, female patients were found in much higher percentage than male and it may be due to the social and cultural dynamics of the state. A major chunk of the female population tends to work inside their houses in closed environment. Low air ventilation at home increases the overall risk of developing infectious diseases.

A significant number of patients belonged to the age group of 16-30 years, similar age group preponderance was seen in studies of Kamal et al and Jha BC et al. Demographic profiles of this study were consistent with studies of southeast Asian regions, where majority of the subjects were from rural areas(Jha *et al.*, 2001; Kamal *et al.*, 2016). Jha BC et al found that there were very few patients having cervical abscess or discharging sinus (5% each), Kamal et al had more patients with such presentation (Abscess:21%;Sinus:9%), while in our study very few patients presented with discharge sinus (1.8%) but a large proportion of cases had abscess formation (18.2%). Abscess were found much higher in our study due to delayed presentation as most patients came from rural and hilly regions where transport is not easily available and health education is low.

Unilateral neck swelling was found to be most common in our study (83.6% cases), which was consistent with the study done in Bangladesh (87.7%) but much higher than the study done in north India (67.8%)(Jha *et al.*, 2001; Kamal *et al.*, 2016). Jha BC et al found multiple lymph nodes in 57% of the cases out of which, 71.9% were matted and 28.1% were discrete(Jha *et al.*, 2001). Similarly, Kamal et al found multiple lymph nodes in 82.3% of subject, of which 68.6% were matted and 31.4% were discrete. Our findings are consistent with both the studies. Jha BC et al found level II lymph nodes involved the most, followed by level III, while Kamal et al found level V involved more than level II(Jha *et al.*, 2001; Kamal *et al.*, 2016). In our study, we found level V to be most commonly involved followed by level III.

Systemic features found in our study (68.2% of cases) were consistent with a regional study of Bangladesh(Kamal *et al.*, 2016), but the clinical findings do not match with regional studies of north India and Pakistan, where systemic symptoms were present in only 18% and 8% of the subjects respectively(Jha *et al.*, 2001; Ahmed, 2013). Kamal et al and Jha BC et al found patients to be FNAC positive in 85.7% and 83.9% respectively, while our study found only 40.9% positive(Jha *et al.*, 2001; Kamal *et al.*, 2016). The difference in results is due to the criteria of defining FNAC positive. In our study, we have taken FNA for ZN staining positive for AFB as 'FNAC positive'. Jha BC et al and Kamal et al found lung lesions in 16% and 3.1% of chest radiographs respectively, while we found lung lesions in 13.6% of the Chest X-rays.(Jha *et al.*, 2001; Kamal *et al.*, 2016) Jha BC et al and Kamal et al found ESR raised in 92.9% and 70.8% cases respectively(Jha *et al.*, 2001; Kamal *et al.*, 2016).In this study, ESR was raised in 66.4% of the subjects. A few limitations of this study were that we did not perform liquid culture for Mycobacterium tuberculosis, due to lack of facilities and Mantoux test and FNA for CBNAAT was not performed in every patient as it is not recommended in the guidelines(Department of Medicine, All India Institute of Medical Sciences, New Delhi WHO Collaborating Centre (WHO-CC) for Training and Research in Tuberculosis Centre of Excellence for Extra-Pulmonary Tuberculosis, Ministry of Health and Family Welfare, 2016).

Conclusions

This study concluded that the tuberculosis is still the commonest cause of cervical lymph node enlargement in developing countries. Disease is relatively more common in younger patients (16–30 years). A single discrete node can be the presentation in many of these patients, but majority present with multiple lymph nodes. Constitutional symptoms were absent in some of the patients. Discharging sinus is now relatively rare in cervical tuberculous lymphadenitis, although abscess formation still occurs. Although AFB is seen in relatively few patients, diagnosis can be clenched by typical features seen in fine needle aspiration cytology(FNAC). Hence, FNAC has emerged as a rapid, inexpensive, simple, and effective method of diagnosis for cervical tubercular lymphadenopathy.

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