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Original Research Article

Extrapulmonary tuberculosis - surgeons' experience at a district hospital: a study of 84 cases

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ABSTRACT

Background: Managing extrapulmonary tuberculosis (EPTB) is challenging due to the non-specific signs and symptoms, the low sensitivity of diagnostic tests, and the potential for the disease to mimic other conditions. The aim of the study was to evaluate the clinical characteristics, surgical management, and outcomes of extrapulmonary tuberculosis at a district hospital, based on an analysis of 84 cases.
Methods: This prospective study was conducted at the Department of Surgery in collaboration with the Department of Medicine at Magura District Hospital and private clinics of Magura District, Magura, Bangladesh, from January 1, 2013, to December 31, 2018, including 84 patients diagnosed with extrapulmonary tuberculosis. Informed consent was obtained from all participants or their guardians, and data on demographics, clinical presentation, diagnostic tests, and treatment outcomes were analyzed using SPSS version 20.
Results: The study showed that 33 (39.29%) patients were aged 21-30 years, with a majority being female 49 (58.33%) and from rural areas 46 (54.76%). All patients had a palpable mass, with the cervical lymph nodes most affected 78 (92.86%). Lymph node tuberculosis was the most common site 55 (65.48%) and chest radiography was negative for tuberculosis in 81 (96.43%) patients. Treatment was medical only for 41 (48.81%) patients and combined medical and surgical for 43 (51.19%) patients.
Conclusions: Extrapulmonary tuberculosis, particularly cervical lymph node involvement, remains prevalent in rural, low socio-economic populations, underscoring the importance of comprehensive diagnostic and treatment approaches.

Keywords: Clinical characteristics, District hospital, Extrapulmonary tuberculosis (EPTB), Surgical management, Treatment outcomes

INTRODUCTION

Tuberculosis (TB) is one of humanity's oldest diseases and remains a critical global health issue. It ranks as the ninth leading cause of death worldwide and is the foremost cause of death from a single infectious agent.[1] In 2013, there were around 9 million new cases of TB, including 1.1 million among individuals living with HIV, leading to an estimated 1.5 million deaths.[2,3] Pulmonary tuberculosis is the most prevalent form, but extrapulmonary tuberculosis (EPTB) is also a significant concern, involving TB in areas outside the lungs.[4] The global TB burden includes a considerable prevalence of EPTB. In Bangladesh, TB remains a major public health issue, with high incidence and prevalence rates underscoring the ongoing challenge of managing both pulmonary and extrapulmonary forms of the disease. Extrapulmonary tuberculosis (EPTB) occurs more

frequently in children than in adults due to a higher risk of lymphohematogenous spread, especially in younger children. EPTB accounts for about 15 to 20 percent of all tuberculosis cases in immunocompetent patients and over 50 percent in HIV-positive individuals.[4] It can affect any organ, with the lymph nodes, particularly the cervical group, being the most commonly involved, often presenting as tubercular lymphadenitis, historically known as "scrofula".[5] Despite its prevalence, EPTB's clinical presentation is often atypical, making diagnosis challenging. Obtaining tissue samples for confirmation can be difficult and conventional diagnostic methods frequently have a low yield, leading to diagnostic delays. Although tuberculosis is widespread, breast tuberculosis remains a rare manifestation of the disease. Mammary cells exhibit considerable resistance to the survival and proliferation of Mycobacterium tuberculosis.[6] This resistance is due to the fact that, similar to skeletal muscle and the spleen, the breast provides an environment that is not conducive to the survival and multiplication of tubercular bacilli.[7]

Managing extrapulmonary tuberculosis (EPTB), is challenging due to the non-specific signs and symptoms, the low sensitivity of diagnostic tests, and the potential for the disease to mimic other conditions.[8] These challenges are compounded by poor access to healthcare, which not only delays diagnosis and treatment but also contributes to the ongoing transmission and stigma of the disease.[9] Cervical tubercular lymphadenitis (CTL), a form of EPTB, highlights these difficulties as it frequently mimics other pathological conditions and produces inconsistent physical and laboratory findings.[10] In situations where medical treatment alone is inadequate, surgical intervention becomes necessary. Procedures such as biopsy and fine needle aspiration cytology (FNAC) are essential for obtaining diagnostic tissue samples and managing complications, making them widely accepted, cost-effective, and safe methods in the surgical management of EPTB.[11,12]

Given the complex nature of extrapulmonary tuberculosis (EPTB) and the challenges associated with its diagnosis and management, particularly in resource-limited settings, there is a pressing need to better understand these issues. EPTB presents with varied clinical manifestations that often complicate diagnosis and management strategies may differ significantly based on available resources. Surgical interventions can play a critical role when medical treatments alone are insufficient.

This study aims to evaluate the clinical characteristics, surgical management, and outcomes of EPTB by analyzing 84 cases treated at a district hospital. Through this comprehensive analysis, the study seeks to provide valuable insights into the effective management of EPTB in such settings, contributing to improved treatment protocols and patient outcomes. The aim of the study was to evaluate the clinical characteristics, surgical management and outcomes of extrapulmonary tuberculosis at a district hospital, based on an analysis of 84 cases.

METHODS

Study place

The study was conducted at the Department of Surgery in collaboration with the Department of Medicine at Magura District Hospital and private clinics of Magura District, Magura, Bangladesh.

Study duration

The study period was from January 1, 2013 to December 31, 2018.

Sample size

The study population included 84 patients diagnosed with extrapulmonary tuberculosis during this period.

Inclusion criteria

It includes patients aged 12 years and older with a confirmed diagnosis of extrapulmonary tuberculosis. Patients with complete clinical records and follow-up data.

Exclusion criteria

Patients with incomplete records, individuals with disseminated tuberculosis.

Data collection

Informed consent was obtained from all participants or their guardians, ensuring confidentiality and voluntary participation. Data were collected prospectively through clinical assessments, including detailed history, physical examination, and relevant diagnostic tests.

Diagnostic tools

Diagnostic tools included chest radiography for pulmonary assessment, and routine laboratory tests such as erythrocyte sedimentation rate (ESR). Chest X-ray was conducted for pulmonary involvement, and routine investigations, including ESR, were performed for all patients. Treatment was administered according to national tuberculosis treatment guidelines, combining medical therapy with surgical intervention when necessary.

Statistical analysis

Patients were followed up regularly to monitor treatment response and resolution of symptoms. Data were

analyzed using descriptive statistics, including frequencies and percentages, to summarize demographic characteristics, clinical presentation, diagnostic results, and treatment outcomes, with SPSS version 20 used for statistical analysis.

RESULTS

The age distribution of patients shows that 25 (29.76%) were aged 12-20 years, 33 (39.29%) were aged 21-30 years, 14 (16.67%) were aged 31-40 years, 6 (7.14%) were aged 41-50 years, and 6 (7.14%) were aged ≥51 years. The gender breakdown indicates 35 (41.67%) male and 49 (58.33%) female patients. The majority resided in rural areas 46 (54.76%), with 28 (33.33%) in urban areas and 10 (11.90%) in semi-urban areas. Socio-economic conditions were primarily low 49 (58.34%), followed by lower-middle 31 (36.90%) and middle 4 (4.76%). Occupations included housewives 32 (38.10%), students 21 (25.00%) and other roles. History of tuberculosis exposure was reported in 22 (26.19%) patients.

Table 1: Age distribution of patients.

Variables		No. of patients	(%)
Age (in years)	12-20	25	29.76
	21-30	33	39.29
	31-40	14	16.67
	41-50	6	7.14
	≥51	6	7.14
Gender	Male	35	41.67
	Female	49	58.33
Residence	Rural	46	54.77
	Semi-urban	10	11.90
	Urban	28	33.33
Socio-economic condition	Low	49	58.34
	Lower-middle	31	36.90
	Middle	4	4.76
Occupation	House wife	32	38.10
	Student	21	25.00
	Day labour	9	10.71
	Business	8	9.52
	House maid	5	5.96
	Unemployed	9	10.71
History of tb exposure	Yes	22	26.19
	No	62	73.81

All patients 84 (100.00%) reported a palpable mass. Other symptoms included weight loss in 23 (27.38%) patients and loss of appetite in 27 (32.14%). Tubercular lesions on chest X-ray were present in 12 (14.29%) patients. The predominant lymph node site was cervical 78 (92.86%), with fewer cases of axillary 9 (10.71%) and inguinal 2 (2.38%). The lymph node condition was matted in 28 (33.33%) patients, with firm 22 (26.19%), fluctuating/abscess 18 (21.43%) and soft 8 (9.52%). Tenderness was observed in 26 (30.95%) patients and 59 (70.24%) patients had mobile lymph nodes.

Table 2: Clinical characteristics of the study patients (n=84).

Variables		No. of patients	%
Symptoms	Palpable mass	84	100.00
	Fever	12	14.29
	Cough	10	11.90
	Night sweats	19	22.62
	Weight loss	23	27.38
	Loss of appetite	27	32.14
Tubercular lesions on chest x-ray	Present	12	14.29
	Absent	72	85.71
Lymph node site	Cervical	78	92.86
	Axillary	9	10.71
	Inguinal	2	2.38
Number of lymph nodes	Single	50	59.52
	2-4	23	27.38
	≥5	11	13.10
Condition	Soft	8	9.52
	Firm	22	26.19
	Matted	28	33.33
	Fluctuant/abscess	18	21.43
	Draining sinus	8	9.52
Tenderness	Present	26	30.95
	Absent	58	69.05
Mobility of nodes	Mobile	59	70.24
	Nonmobile	25	29.76

Table 3: Distribution of extrapulmonary tuberculosis sites (n=84).

Site		No. of patients	%
Lymph node TB		55	65.48
Breast	Mass	4	4.76
	Abscess	4	4.76
Intestinal tb (per operative)		4	4.76
Chronic scar (post-surgical)		4	4.76
Testis		1	1.19
Ovary		1	1.19
Soft tissue mass		2	2.38
Peritoneal deposit		2	2.38
Abscess		4	4.76
Sinus		3	3.57

Lymph node tuberculosis was the most common site, affecting 55 (65.48%) patients. Other sites included breast mass 4 (4.76%), breast abscess 4 (4.76%), intestinal tuberculosis (per operative) 4 (4.76%), and chronic scar (post-surgical) 4 (4.76%). Less common sites included testis 1 (1.19%), ovary 1 (1.19%), soft

tissue mass 2 (2.38%), peritoneal deposit 2 (2.38%), abscess 4 (4.76%) and sinus 3 (3.57%).

Table 4: Laboratory investigations and treatment outcomes (n=84).

Variables		No. of patients	(%)
Chest radiography	Negative for TB	81	96.43
	Positive for TB	3	3.57
ESR	>30 mm in 1st hour	72	85.71
	<30 mm in 1st hour	12	14.29
Treatment	Medical only	41	48.81
	Medical and surgical	43	51.19

Chest radiography results were predominantly negative for tuberculosis, with 81 (96.43%) patients showing negative results and 3 (3.57%) patients showing positive results. The erythrocyte sedimentation rate (ESR) was elevated (>30 mm in 1st hour) in 72 (85.71%) patients, while 12 (14.29%) patients had a normal ESR (<30 mm in 1st hour). Treatment regimens included medical treatment only for 41 (48.81%) patients and a combination of medical and surgical treatment for 43 (51.19%) patients.

DISCUSSION

This study evaluates the clinical characteristics, management and outcomes of extrapulmonary tuberculosis (EPTB) based on an analysis of 84 cases at a district hospital. The findings highlight a predominance of EPTB in younger adults, particularly females, with a significant occurrence in rural and socio-economically disadvantaged populations. The study identified cervical lymph nodes as the most common site of involvement, with a majority of patients presenting with a palpable mass and symptoms like weight loss and loss of appetite. Despite most chest radiographs being negative for tuberculosis, a substantial number of cases required combined medical and surgical treatment. These insights aim to improve the understanding and management of EPTB in similar resource-limited settings. Tuberculosis has evolved into a novel clinical entity due to its shifting patterns of clinical presentation and dissemination, marked by an increasing prevalence of extrapulmonary forms.[13]

In our study, the age distribution of patients with extrapulmonary tuberculosis (EPTB) reveals that 25 (29.76%) were aged 12-20 years, 33 (39.29%) were aged 21-30 years, 14 (16.67%) were aged 31-40 years, 6 (7.14%) were aged 41-50 years and 6 (7.14%) were aged ≥51 years. This distribution is consistent with Singh et al, who reported similar age brackets in their study on EPTB cases. The predominance of younger patients in our study aligns with Fontanilla et al, who noted a significant incidence in the 20–40 years age group, though their peak age was slightly different.[11,14] This similarity suggests that EPTB frequently affects younger populations, emphasizing the need for targeted awareness and screening in these age groups. Our study also found a higher prevalence of female patients (58.33%) compared to male patients (41.67%), resulting in a male-to-female ratio of approximately 1:1.4. This finding is in line with other studies who observed a similar ratio.[11,14] In contrast, Bezabih et al, reported a male predominance with a ratio of 1.3:1.[15] This gender distribution underscores the potential influence of socio-cultural factors on EPTB prevalence, highlighting the importance of considering these factors when developing public health strategies.

The majority of patients in our study resided in rural areas (54.76%) and came from low socio-economic backgrounds (58.34%), which is consistent with findings from regional studies.[16,17] This distribution aligns with the study by Jha et al, who found similar demographic patterns in their research.[17] The high proportion of patients from rural and lower socio-economic backgrounds in our study suggests that EPTB management strategies need to address the challenges specific to these communities, such as limited healthcare access and socio-economic barriers. In our study, all patients (100%) reported a palpable mass, consistent with Singh et al, findings.[14] We observed weight loss in 27.38% and loss of appetite in 32.14% of patients, aligning with typical symptoms of extrapulmonary tuberculosis. Chest X-ray abnormalities were present in 14.29% of cases, similar to another study who found similar results in their study 14.7%.[14] Cervical lymph nodes were affected in 92.86% of our patients, consistent with other studies.[18,19] These findings support the consistency of our results with existing literature on extrapulmonary tuberculosis.

In our study, lymph node tuberculosis was the most prevalent site, affecting (65.48%) patients, which is consistent with Hussain et al, findings.[20] Other sites in our study included breast mass (4.76%), breast abscess (4.76%), intestinal tuberculosis (per operative) (4.76%) and chronic scar (post-surgical) (4.76%). Less common sites included testis (1.19%), ovary (1.19%), soft tissue mass (2.38%), peritoneal deposit (2.38%), abscess (4.76%) and sinus (3.57%). This distribution underscores the predominance of lymph node tuberculosis and the relative rarity of other extrapulmonary sites. The presence of breast-related manifestations and abscesses, though less frequent, highlights the diverse clinical presentations of extrapulmonary tuberculosis. Breast tissue, skeletal muscle and the spleen are notably resistant to tuberculosis. Breast tuberculosis predominantly affects younger individuals but can occasionally present in older individuals as a lump resembling breast cancer. In younger patients, it typically manifests as a pyogenic breast abscess.[21] Understanding these distribution patterns is crucial for developing targeted diagnostic and management strategies in similar resource-limited settings. In our study, chest radiography results were

predominantly negative for tuberculosis, with 96.43% of patients showing negative results, which contrasts with findings from Magsi et al, who reported higher rates of associated lung lesions at 16% and 7.5%, respectively.[22] Similarly, our study observed elevated erythrocyte sedimentation rate (ESR) in 85.71% of patients, which aligns closely with Hussain et al, finding of 85.92%.[15,20]

In contrast, Jha et al, found elevated ESR in almost all patients, while Magsi et al, and Umer et al, reported lower percentages of elevated ESR at 12.5% and 47.7%, respectively.[11,17,22,23] Regarding treatment, 51.19% of our patients required a combination of medical and surgical approaches, reflecting a similar trend noted by another study, who found surgery necessary in only a small proportion of cases.[17] This suggests variability in the need for surgical intervention based on clinical presentation and response to medical treatment. These findings highlight the need for tailored management strategies that account for regional and demographic differences. Continued research and local data collection are essential to refine treatment protocols and improve patient outcomes in the evolving landscape of extrapulmonary tuberculosis.

This study had several limitations, small sample size may limit the generalizability of the findings, single-center study might introduce bias in the results, the study's limited geographic scope may introduce sample bias, potentially affecting the broader applicability of the findings.

CONCLUSION

In this study of 84 cases of extrapulmonary tuberculosis, cervical lymph node involvement was most common (75%). The majority of patients were female, from rural areas, and had low socio-economic status. Palpable mass was the predominant symptom. Chest radiography was negative for most patients, and elevated ESR levels were prevalent. Treatment was almost evenly divided between medical only and combined medical and surgical approaches. These findings emphasize the need for targeted diagnostic and treatment strategies for extrapulmonary tuberculosis in district hospital settings.

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