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Prevalence and Risk Factors of ENT Symptoms in Extra-Pulmonary Tuberculosis Patients

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Abstract

Background: Ear, nose, and throat (ENT) symptoms are less well-documented but are vital for diagnosis and treatment of extra-pulmonary tuberculosis (EPTB), which affects organs outside the lungs.

Objective: The objective of the study was to evaluate the various ENT symptoms of TB in patients undergoing treatment at a tertiary care hospital's outpatient department (OPD).

Methodology: In this cross-sectional research, which took place at Hazara University, KPK, between August 2020 and January 2021, 124 patients with ENT-related EPTB were included. Complete ENT histories, physical exams, and a range of diagnostic tests, such as biopsies, endoscopies, and chest X-rays, were performed on the participants. SPSS version 25 was utilized to analyze the data, and the chi-square test was used to look into any relationships between risk variables like smoking. Determining statistical significance required a p-value of less than 0.05.

Results: Among the 124 patients with EPTB, the most prevalent ENT symptom was neck swelling, affecting 31 patients (25.00%). This was followed by laryngitis in 28 patients (22.58%) and pharyngitis in 25 patients (20.16%). Chronic sinusitis was observed in 22 patients (17.74%), while voice changes and otitis media were noted in 19 patients (15.32%) and 18 patients (14.52%), respectively. Hemoptysis was present in 15 patients (12.10%). The prevalence of these symptoms was notably higher in patients with symptoms lasting 6-12 months. Additionally, smoking was significantly associated with increased rates of laryngitis ($p = 0.033$) and hemoptysis ($p = 0.039$).

Conclusion: The research demonstrates that common ENT symptoms in EPTB include neck edema, laryngitis, and pharyngitis, with symptom duration and smoking status having a major impact on their incidence.

Keywords: Extra-Pulmonary Tuberculosis (EPTB), ENT, Tuberculosis, TB, Diagnosis, Risk Factors, Clinical Features

Introduction

The ENT (ear, nose, and throat) regions are among the organs other than the lungs that are affected by extra-pulmonary tuberculosis (EPTB) [1,2]. While pulmonary TB has been well researched, less is known about EPTB, especially when it comes to its effects on the ENT system [3]. In these areas, EPTB often presents with a mild clinical presentation that is easily misinterpreted or missed, delaying treatment and sometimes resulting in consequences [4,5].

Symptoms in these regions may be suggestive of underlying systemic illnesses, such as tuberculosis [6]. The ENT are important interfaces between the body's internal systems and the external environment. Otitis media, chronic sinusitis, laryngitis, and pharyngitis are only a few of the many ENT symptoms of EPTB that might resemble other prevalent diseases or disorders [7, 8]. A thorough knowledge of these symptoms' presentation in the context of tuberculosis (TB) is crucial for an accurate diagnosis and successful treatment, since these symptoms have the potential to vary greatly and to overlap with other illnesses [9].

There is a rare chance to thoroughly examine these ENT symptoms in the setting of a tertiary care hospital, where patients with complicated and variable presentations are often admitted [10,11]. Insights into the frequency, nature, and severity of ENT symptoms linked to EPTB may be gained via a clinical trial that focuses on this area, improving diagnostic precision and guiding

treatment plans [12].

The wide range of ENT symptoms seen in extra-pulmonary tuberculosis patients highlights the need of a targeted clinical assessment and recording. Through the methodical assessment of these symptoms in TB patients receiving therapy in an outpatient department of a tertiary care hospital, this research seeks to close the knowledge gap and enhance the therapeutic strategy for treating ENT manifestations of EPTB.

Objective

The objective of the current study was to evaluate the various ENT symptoms of TB in patients undergoing treatment at a tertiary care hospital's outpatient department (OPD).

Materials and methods

Study Design and Setting

This research was a cross-sectional clinical study carried out from August 2020 to January 2021 at the Hazara University in Mansehra. Data was collected from King Abdullah Teaching Hospital Mansehra and Mansehra Medical Complex at the Department of ENT. The study used a randomized selection technique to choose participants from the department's outpatient clinic.

Inclusion and Exclusion Criteria

The research included patients with head and neck lesions or those diagnosed with EPTB affecting the ear, nose, or throat who were 11 years of age or older. Patients on immunosuppressive drugs or those with an HIV diagnosis were not included. Furthermore, patients who failed to provide informed permission were not included in the research.

Sample Size

A total of 197 patients were initially assessed for ENT symptoms suggestive of tuberculosis in the outpatient clinic. After a thorough evaluation, 124 patients met the study's inclusion criteria and were subsequently included in the research.

Data Collection

Every patient had a thorough ENT history, with particular attention paid to symptoms including persistent neck swellings, hemoptysis, weight loss, altered voice, persistent cough, and fever. Family and prior TB history was also recorded. A comprehensive systemic and general ENT examination was performed on each patient. X-rays of the chest, cervical spine, and soft tissue neck were among the diagnostic techniques used. When necessary, endoscopic assessments including direct laryngoscopy, nasal endoscopy, and otoendoscopy were also performed. Additional tests included sputum AFB staining, culture and sensitivity testing, fine needle aspiration cytology (FNAC), ultrasound neck examination for suspicious swellings, and biopsy for possible laryngeal lesions.

Statistical Analysis

SPSS version 25 was used to analyze the data. Utilizing the chi-square test, the relationship between risk factors like smoking was examined. A p-value of less than 0.05 was used to define statistical significance. The results were shown as percentage-based tables and chart.

Ethical Approval

The study was conducted in accordance with ethical standards and received approval from the Institutional Review Board (IRB) of Hazara University Mansehra, under approval number 843/IRB/ENT/HUM. All participants provided informed consent prior to inclusion in the study.

Results

The demographic and baseline details of the 124 research participants with EPTB are shown in Table 1. Of them, 10 (8.06%) are between the ages of 11 and 20; 30 (24.19%) are between the ages of 21 and 30; and 35 (28.23%) are between the ages of 31 and 40. Nine patients (7.26%) are over 60, 18 patients (14.52%) are between 51 and 60 years old, and 22 patients (17.74%) are in the 41–50 age bracket. There are 54 females (43.55%) and 70 men (56.45%) in the gender distribution. 45 patients (36.29%) have had symptoms for less than six months, 52 patients (41.94%) for six to twelve months, and 27 patients (21.77%) for more than twelve months. According to their smoking status, 30 patients (24.19%) smoke, while 94 patients (75.81%) do not smoke.

Table 1: Demographic and Baseline Characteristics of Study Participants

Characteristic		n	%
Age (years)	11-20	10	8.06
	21-30	30	24.19
	31-40	35	28.23
	41-50	22	17.74
	51-60	18	14.52
	>60	9	7.26
Gender	Male	70	56.45
	Female	54	43.55
Duration of Symptoms	<6 months	45	36.29
	6-12 months	52	41.94
	>12 months	27	21.77
Smoking	Smoker	30	24.19
	Non-Smoker	94	75.81

The incidence of different ENT symptoms in individuals with EPTB is shown in Figure 1. Thirteen individuals (25.00%) out of the 124 respondents reported having neck swelling as their most prevalent symptom. After that, 28 patients (22.58%) had laryngitis, and 25 patients (20.16%) had pharyngitis. Twenty-two patients (17.74%) reported having chronic sinusitis, whereas eighteen patients (14.52%) and 19 patients (15.32%) experienced voice abnormalities and otitis media, respectively. Of the patients, 15 (12.10%) had hemoptysis.

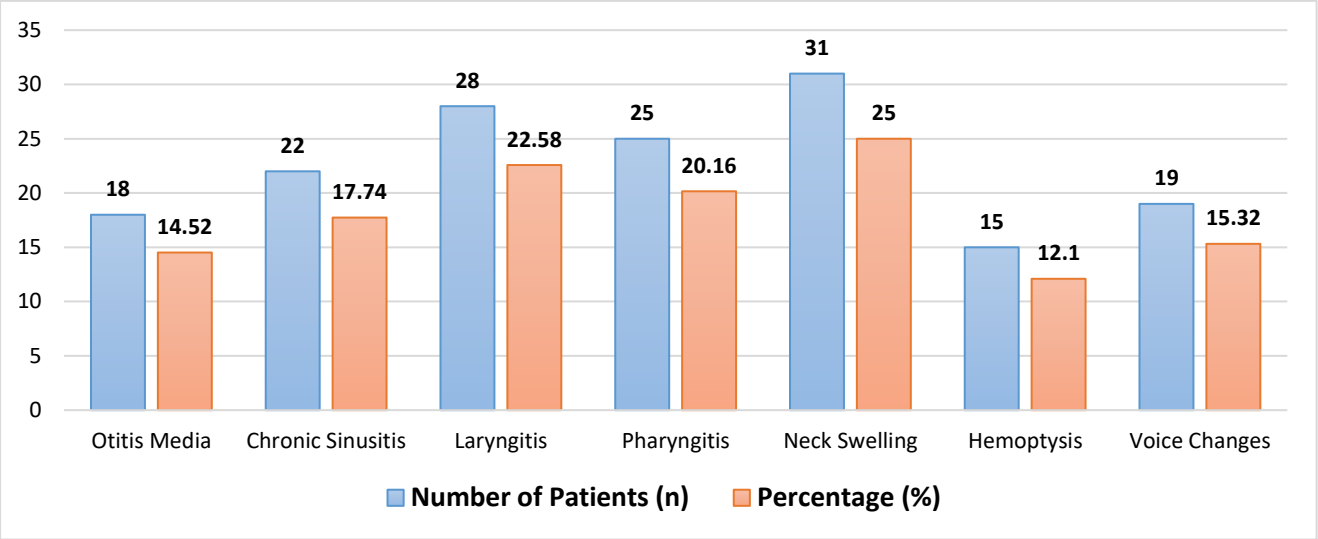

Figure 1: Prevalence of ENT Symptoms in Patients with EPTB

Table 2 looks at the relationship between different ENT manifestations and how long EPTB symptoms have been present. The following symptoms are most common in people whose symptoms have persisted for less than six months: Five patients (27.78%) had otitis media; seven patients (31.82%) had chronic sinusitis; nine patients (32.14%) had laryngitis; eight patients (32.0%) had pharyngitis; ten patients (32.26%) had neck swelling; five patients (33.33%) had hemoptysis; and seven patients (36.84%) had voice abnormalities. The frequency rises to: otitis media in 8 patients (44.44%); chronic sinusitis in 10 patients (45.45%); laryngitis in 12 patients (42.86%); pharyngitis in 12 patients (48.00%); neck swelling in 15 patients (48.39%); hemoptysis in 8 patients (53.33%); and voice abnormalities in 8 patients (42.11%) for those whose symptoms last for six to twelve months. The prevalence is lower in patients whose symptoms have persisted for more than a year: 5 patients (27.78%) had otitis media, 5 patients (22.73%) had chronic sinusitis, 7 patients (25.00%) had laryngitis, 5 patients (20.00%) had pharyngitis, 6 patients (19.35%) had neck swelling, 2 patients (13.33%) had hemoptysis, and 4 patients (21.05%) had voice abnormalities. This table shows that although the frequency of symptoms typically reduces in individuals with longer duration of disease, certain symptoms, such as neck swelling and hemoptysis, seem to be more frequent in patients with symptoms lasting between 6 and 12 months.

The results of many diagnostic techniques used to assess individuals with EPTB are compiled in Table 3. With 36 patients (29.03%) exhibiting abnormalities, chest X-rays were the most often found aberrant results among the 124 patients. Of the patients, 28 (22.58%) had abnormalities found by direct laryngoscopy, while 25 (20.16%) had positive findings from an ultrasonography neck check. Sputum tested positive for AFB in 23 individuals (18.55%), while X-rays of the cervical spine revealed abnormalities in 22 patients (17.74%). Twenty patients (16.13%) and nineteen patients (15.32%) had positive findings from fine needle aspiration cytology (FNAC) and biopsy, respectively. Less often than expected, nasal endoscopy and otoendoscopy revealed positive results in 12 patients (9.68%) and 15 patients (12.10%), respectively.

Table 2: Association between Duration of EPTB Symptoms and ENT Manifestations

Symptom	<6 Months	6-12 Months	>12 Months
Otitis Media	5 (27.78%)	8 (44.44%)	5 (27.78%)
Chronic Sinusitis	7 (31.82%)	10 (45.45%)	5 (22.73%)
Laryngitis	9 (32.14%)	12 (42.86%)	7 (25.00%)
Pharyngitis	8 (32.00%)	12 (48.00%)	5 (20.00%)
Neck Swelling	10 (32.26%)	15 (48.39%)	6 (19.35%)
Hemoptysis	5 (33.33%)	8 (53.33%)	2 (13.33%)
Voice Changes	7 (36.84%)	8 (42.11%)	4 (21.05%)

The association between smoking and the incidence of different ENT symptoms in individuals with EPTB is examined in Table 4. With p-values of 0.033* and 0.039*, respectively, the findings show that smoking is substantially related with laryngitis and hemoptysis, indicating a possible connection between smoking and these symptoms. In particular, smokers had hemoptysis in 46.67% of cases compared to 53.33% of non-smokers and laryngitis in 35.71% of cases compared to 64.29% of non-smokers. As seen by their higher p-values, other symptoms such otitis media, chronic sinusitis, pharyngitis, neck edema, and voice abnormalities did not

significantly correlate with smoking.

Table 3: Abnormal Diagnostic Findings in Patients with EPTB

Diagnostic Procedure	Finding	n	Percentage (%)
Chest X-ray	Abnormal	36	29.03
Cervical Spine X-ray	Abnormal	22	17.74
Soft Tissue Neck X-ray	Abnormal	18	14.52
Direct Laryngoscopy	Abnormal	28	22.58
Nasal Endoscopy	Abnormal	12	9.68
Otoendoscopy	Abnormal	15	12.10
FNAC	Positive	20	16.13
Ultrasound Neck Examination	Positive	25	20.16
AFB Staining of Sputum	Positive	23	18.55
Biopsy	Positive	19	15.32

Table 4: Association between Smoking and Occurrence of ENT Symptoms in EPTB Patients

Symptom	Smokers (n, %)	Non-Smokers (n, %)	Chi-Square Value	p-Value
Otitis Media	6 (33.33%)	12 (66.67%)	1.33	0.248
Chronic Sinusitis	8 (36.36%)	14 (63.64%)	3.31	0.069
Laryngitis	10 (35.71%)	18 (64.29%)	4.52	0.033*
Pharyngitis	7 (28.00%)	18 (72.00%)	0.38	0.536
Neck Swelling	10 (32.26%)	21 (67.74%)	3.25	0.072
Hemoptysis	7 (46.67%)	8 (53.33%)	4.28	0.039*
Voice Changes	6 (31.58%)	13 (68.42%)	1.29	0.256

**P-value <0.05 is significant*

Discussion

We assessed the frequency and features of ENT symptoms in individuals with EPTB in this investigation. According to our research, neck swelling affected 25% of the 124 patients and was the most prevalent ENT symptom, followed by laryngitis in 22.58% and pharyngitis in 20.16%. These findings are consistent with a prior research [13] that found laryngitis and neck edema to be common symptoms of EPTB. Similar to our findings, a research by Djannah et al. [14] found that neck edema occurred in 22.5% of EPTB patients. In a similar vein, our study's laryngitis prevalence of 24% agrees with that of Pajor et al. [15].

The length of time that symptoms persisted seems to affect the frequency of certain ENT symptoms. Neck edema and hemoptysis were significantly more common in individuals whose symptoms persisted for six to twelve months (48.39% and 53.33%, respectively). These results are consistent with other research that found laryngitis and chronic sinusitis to be more common conditions with longer symptom durations [1,16]. On the other hand, among those whose symptoms persisted for more than a year, our research found a decline in symptom prevalence. This may indicate that, as a result of modifications in the course of the illness or patient adaptability, a greater number of chronic patients may exhibit fewer or different symptoms. According to our study's diagnostic results, chest X-rays were shown to be the most often occurring aberrant finding in 29.03% of patients. This is in line with earlier research, which also shown the value of chest X-rays in the diagnosis of EPTB [17]. In 22.58% of instances, direct laryngoscopy revealed abnormalities; this is comparable to the 23% observed in a prior research [18].

Our research revealed a significant correlation between smoking and hemoptysis (p=0.039) as well as laryngitis (p=0.033). These symptoms were more common among smokers, which is consistent with earlier research that found smoking to be associated with a greater incidence of laryngeal symptoms in tuberculosis patients [19, 20]. This implies that smoking may make certain ENT symptoms in EPTB patients worse or increase their severity. The prior research, which found smoking to be a risk factor for a wider variety of ENT manifestations, is in contrast to the absence of substantial relationships for other symptoms such otitis media and chronic sinusitis [21].

All things considered, our research offers insightful information on the ENT domain's EPTB symptom profile and diagnostic difficulties. The comparison with existing literature reveals both similarities and variations, emphasizing the need of further study to improve diagnostic standards and treatment plans for EPTB symptoms in the ENT.

Study Limitations

When evaluating the results, it is important to take into account the limitations of this research. First off, the cross-sectional design makes it more difficult to determine whether smoking, the length of symptoms, or certain ENT manifestations are causally related. Furthermore, while sufficient for initial analysis, the study's 124 patient sample size could not accurately reflect the diversity of EPTB symptoms in larger or distinct groups. Further limiting the generalizability of the findings to all EPTB patients may be the exclusion of individuals with HIV or those using immunosuppressive

drugs. In addition, biases in reporting and diagnosis may arise from depending too much on self-reported symptoms and diagnostic techniques. Future studies with bigger, more varied sample sizes and longitudinal methods may provide a more thorough knowledge of ENT symptoms in EPTB.

Conclusion

Our research emphasizes how critical it is to identify and carefully examine ENT symptoms in patients with EPTB since these signs are often mild and may be confused for a variety of other illnesses. We underscore the need of increased awareness and thorough diagnostic techniques in EPTB patients by highlighting frequent symptoms such as neck swelling, laryngitis, and pharyngitis, and pointing out the variation in symptom predominance depending on the length of the illness. The noteworthy correlation between smoking and certain symptoms emphasizes the significance of patient history in influencing clinical assessments. The aforementioned discoveries enhance our comprehension of EPTB and facilitate the creation of focused diagnostic and therapeutic approaches that effectively tackle the intricacies of this illness.

Conflict of interest

The authors state no conflict of interest.

Author Contributions

All authors contributed equally to this study. All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

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