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Ear nose throat manifestation of tuberculosis: a retrospective study in a tertiary care health centre of North India

Sucheta Gupta^{1*}, Vinod Gupta²

¹Department of Otorhinolaryngology, CHC, Chenani, Udhampur, Jammu, Jammu and Kashmir, India

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*Correspondence: Dr. Sucheta Gupta.

E-mail: sucheta.oto@gmail.com

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ABSTRACT

Background: Tuberculosis (TB) involving organs other than the lungs is termed as 'extra pulmonary TB'. Very few studies on otorhinolaryngeal manifestations of TB have been conducted. The aim of this study was to find out incidence of head and neck TB, its varied presentations and clinical manifestations and its association to risk factors such as smoking and alcohol consumption.

Methods: A retrospective randomized observational study was conducted in the department of otorhinolaryngology and head neck surgery, CHC, Chenani, Udhampur, on 120 patients, diagnosed with extra pulmonary TB in ear, nose and throat region of 11 and above age group, over a period of eight months and a follow-up of 6 months.

Results: Out of the 120 selected for the study, majority belonged to the 36-60 years age group (56.67%). Most of the patients were males (57.5%). TB lymphadenopathy was found to be the most common lesion (84.17%), followed by laryngeal TB (6.67%). There were multiple matted lymph nodes in 69 cases and single lymph node in 8 cases; bilateral lymph node involvement was noted in 38 cases. Fever and swelling in the neck were most common presentations. No association was found between specific TB lesions and Smoking or alcohol consumption. 55% of patients showed no co-existing illness. FNAC was the principal diagnostic investigation for the lymph node TB.

Conclusions: Changing patterns of presentations of laryngeal, aural and nasal TB was observed in the study. Therefore, otorhinolaryngologists must keep TB in mind while dealing with head and neck lesions.

Keywords: Extra-pulmonary-TB, Lymphadenopathy, Laryngeal TB smoking

INTRODUCTION

Tuberculosis (TB) is a chronic granulomatous, infectious and communicable disease caused by Mycobacterium TB.1 It is also one of the commonest chronic granulomatous infections in the developing world. According to the estimates, there are 15-20 million cases of infectious TB in the world. Globally in 2012 an estimated 8.6 million people developed TB and 1.3 million died from the disease.2 WHO has revealed an annual incidence of 100 cases per 100000 population in Europe and North America. However, this incidence of TB is as much as three times higher in Asian countries. TB usually attacks the lungs but can also affect other parts of the body; thus, TB involving organs other than the lungs is termed as 'extra pulmonary TB'. Though mycobacterium TB infection can occur in almost all tissues of the body, pulmonary TB represents approximately 80% of all cases of TB.3 Extra pulmonary manifestations of TB, like that of ear, nose and throat are mainly in the form of cervical lymphadenopathy, otitis media, laryngitis, pharyngitis, nasal TB, etc.⁴ Very fewer studies regarding these otorhinolaryngeal manifestations of TB have been conducted. Studies regarding risk

²Department of Medicine, District Hospital, Udhampur, Jammu, Jammu and Kashmir, India

factors for head and neck TB are even sparser, which however comprises about 10% of all the cases of extrapulmonary TB.⁵ Cervical lymph nodes are the most commonly affected, followed by laryngeal TB, deep neck space abscess and TB otitis media.⁶ It is therefore extremely important for otorhinolaryngologists to be aware of these lesions, as the outbreak of multidrug resistant TB coupled with the epidemic of HIV infections, has caused a sudden increase in incidence of the disease.

The present study was conducted to assess different manifestations of TB affecting the ear, nose and throat in patients attending the outpatient Department of Otorhinolaryngology, CHC, Chenani, Udhampur. The aim of the study was to find out incidence of head and neck TB, association of risk factors, its varied presentations, clinical manifestations, diagnostic techniques employed and its association to risk factors such as smoking and alcohol consumption.

METHODS

A retrospective randomized observational study was conducted in the department of otorhinolaryngology and head neck surgery, CHC, Chenani, Udhampur, on 120 patients, diagnosed with extra pulmonary TB in ear, nose and throat region among selected population, over a period of eight months, i.e., from October 2020 to March 2021. The patients were followed up for a further period of 6 months. Randomized sampling technique was used for the selection of cases in the study.

Inclusion criteria

Patients diagnosed with extra pulmonary TB in ear, nose and throat region, or with head and neck lesions, belonging to 11 years and above age groups, attending ENT OPD and willing to be part of study were included in study.

Exclusion criteria

Patients below the age of 11 years, or diagnosed of HIV or on immunosuppressant, were excluded from the study.

A detailed ENT history was obtained from all the patients in order to assess the involvement of the ear, nose and throat. Symptoms like chronic ear discharge, hemoptysis, change in voice, chronic cough, persistent neck swellings, fever and weight loss, were considered significant and important. Relevant past and family history of TB was also obtained. General, systemic and complete ENT examination was carried out. All the patients were subjected to X-ray chest posteroanterior (PA) view. Radiological examination of the soft tissue neck cervical spine and X-ray Schuler's view for mastoid were carried out. Endoscopic examination including otoendoscopy, diagnostic nasal endoscopy and direct laryngoscopy was performed wherever indicated. Ultrasound neck and fine

needle aspiration cytology (FNAC) was performed on all suspected neck swellings. Investigations also included culture and sensitivity and AFB staining of the sputum, pus from discharging sinuses, laryngeal secretions and ear discharge. Direct laryngoscopic and lymph node biopsy was done if required for suspected laryngeal lesions. All data were collected, tabulated and analyzed.

In tubercular lymphadenitis, most patients came with complaint of neck swelling. There were other complaints like cough with expectoration, fever and discharging sinus. The presenting symptoms of TOM (Tubercular otitis media) were: persistent ear discharge not responding to antibiotics, severe to profound hearing loss disproportionate to hearing loss and facial palsy, recurrent ear discharge, profound hearing loss with infra nuclear facial palsy. The common presenting symptoms of laryngeal TB were found to be hoarseness and odynophagia, along with constitutional symptoms of TB.

FNAC was the method found most effective in the diagnosis of TB lymphadenitits. Indirect Laryngoscopy was the method used to diagnose the cases of laryngeal TB. CT and USG were employed in case of deep neck space abscess.

Institutional ethics committee (IEC) permission was obtained prior to the commencement of the study. A written consent was obtained from all patients. Case sheets of study subjects were analysed and data in accordance with the aims and objectives of the study was obtained.

Based on prior studies who had observed lymphadenitis as the most common presentation of TB in the head and neck region (77%), power of study assumed at 80%, anticipated difference between two groups was assumed at 10%, margin of error: 5%, minimum sample size came out to be: 104, which was taken as 120 for the betterment of the study.

The data collected was entered in spreadsheets and analyzed using MS excel 2010 software. Chi-square analysis was used to study the association between the incidences of the lesions with risk factors such as smoking. P value less than 0.05 was considered statistically significant. The data was presented in the form of percentages in tables and pie charts.

RESULTS

Over the period, a total of 193 patients, who attended the OPD of the department, were examined for suspected ENT manifestations of TB. Out of these, only 120 were selected for the study as per the study criteria. Most patients belonged to the 36-60 years age group (56.67%). The mean age of the population was found to be 43.89 years. Most of the patients were males (57.5%) (Table 1).

TB lymphadenopathy was found to be the most common lesion (84.17%) in extra-pulmonary TB in ENT region, followed by laryngeal TB (6.67%), TOM, retropharyngeal abscess, nasal TB and sub-mandibular gland TB (Table 2).

There were multiple matted lymph nodes in 69 cases and single lymph node in 8 cases; bilateral lymph node involvement was noted in 38 cases. Fever and swelling in the neck were found to be the most common presentations (Table 3). The diagnosis was confirmed by USG neck and FNAC of the neck nodes. The patients were immediately started on category I anti TB treatment (ATT) according to revised national TB control Programme (RNTCP) for 6 months. They were kept on monthly follow up till the completion of treatment. In 55 cases the swelling subsided by the end of treatment course.

Table 1: Demographic distribution, (n=120).

| Variables | Frequency | Percentage (%) | | | |
|----------------------|-----------|----------------|--|--|--|
| Age range (in years) | | | | | |
| 11-35 | 37 | 30.83 | | | |
| 36-60 | 68 | 56.67 | | | |
| 61 and above | 15 | 12.50 | | | |
| Gender | | | | | |
| Male | 69 | 57.50 | | | |
| Female | 51 | 42.50 | | | |

Table 2: Incidence of the various head and neck TB lesions among patients, (n=120).

| Nature of lesion | No. of patients | Percentage (%) |
|---------------------------------------|-----------------|----------------|
| Tubercular cervical lymphadenopathy | 101 | 84.17 |
| Laryngeal tuberculosis | 8 | 6.67 |
| Tubercular otitis media (TOM) | 4 | 3.33 |
| Tuberculosis retrophar yngeal abscess | 3 | 2.50 |
| Nasal Tuberculosis | 2 | 1.67 |
| Sub-mandibular gland tuberculosis | 2 | 1.67 |
| Total | 120 | 100 |

Table 3: Common clinical presentations of the patients with lesions, (n=120).

| Presentation | Frequency | Percent- age (%) |
|------------------------------|-----------|---------------------|
| Fever | 54 | 45.00 |
| Swelling in the neck | 43 | 35.83 |
| Cough with expectoration | 9 | 7.50 |
| Pain in the neck | 7 | 5.83 |
| Hoarseness / Change of voice | 7 | 5.83 |
| Total | 120 | 100 |

Figure 1 shows the percentage of the population with risk factors such as smoking and alcohol consumption. Majority of the patients (69%) did not have any of the risk factors. No association was found between specific TB lesions and Smoking or alcohol consumption. There was no statistically significant association found between cervical lymphadenopathy and smoking either and p=0.34.

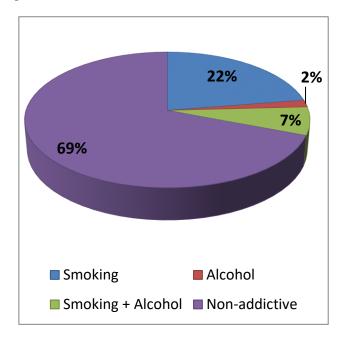


Figure 1: Risk factors, (n=120).

The 55% of patients showed no co-existing illness, while pulmonary TB was the most common co-morbidity, while HIV AIDS was also seen among the patients (Table 4).

Table 4: Coexisting illness among the patients, (n=120).

| Coexisting illness | Frequency | Percentage (%) |
|-------------------------------|-----------|----------------|
| None | 68 | 56.67 |
| Pulmonary tuberculosis | 25 | 20.83 |
| HIV AIDS | 13 | 10.83 |
| Pott's spine | 8 | 6.67 |
| Other extrapulmonary TB | 6 | 5.00 |
| Total | 120 | 100 |

There is no clear and significant association of TB lesions with any other observed parameters, however the age group of 36-60 years, i.e., the middle age group was found to have the maximum number of cases, with a statistically significant association between the incidences of the tubercular lymphadenopathy in the Table 5.

| Table 5: C | omnarison of r | nain TR lesions | with observed | narameters (| n=120). |
|------------|-----------------|-----------------|----------------|---------------|---------|
| Table 5. C | OHIDALISUH UL I | main id iesions | Willi Obseiveu | Dai ameters t | 11-140% |

| Head and neck TB lesion | Age (Years) | M/F | Presentation | Risk factor |
|--|-----------------------------------|----------------|---|--|
| Tubercular cervical lymphadenopathy, (101) | 11-35: 33 36-60: 55 ≥61: 13 | M: 55 F: 46 | Fever: 53, swelling in neck: 15, pain in the neck: 6, cough with expectoration: 11 | No addictions: 69, smoking: 21, alcohol: 4 |
| Laryngeal TB, (8) | 11-35: 2 36-60: 5 ≥61: 1 | M: 5 F: 3 | Cough with expectoration: 2 Hoarseness/change of voice: 7 | No addictions: 4, Smoking: 3, alcohol: 2 |

DISCUSSION

TB is global and is one of the world's deadliest infections. It is estimated that extra-pulmonary TB constitutes 15 to 20 per cent of TB cases in general practice among HIV-negative adults in India. India is the country with the highest burden of TB, with world health organization (WHO) statistics for 2013 giving an estimated incidence figure of 2.1 million cases of TB for India out of a global incidence of 9 million. Extrapulmonary TB forms 10-15% of all cases of TB in India.

According to WHO global TB report 2013 diagnosis of extra pulmonary TB should be based on one culture-positive specimen, or histological or strong clinical evidence consistent with active extra pulmonary disease, followed by a decision by a clinician to treat with a full course of anti-TB chemotherapy. A patient in whom both pulmonary and extra pulmonary TB has been diagnosed should be classified as a pulmonary case.²

In our study TB lymphadenopathy was found to be the most common lesion at 84.17% in extra-pulmonary TB in ENT region, followed by laryngeal TB at 6.67%, in accordance with various studies conducted in London, Pakistan and other parts of India.^{6,10,11} The study sample was not big enough, neither distributed well over various lesions, to analyze the resultant incidence of these lesions gender-wise. However, majority of the cases were found among males only. The male: female ratio did not vary while studying the individual lesions as well. This was in contrast with the study conducted by Khan et al where it was observed that females had higher incidence of TB lymphadenopathy compared to males. It can be attributed to the fact that none of the females studied had history of smoking.⁶

A study conducted by Pandurang et al on 70 patients from the year 2011-2013 in a renowned hospital in Mangalore revealed that the most common presentation of TB in the head and neck region was TB lymphadenitis (77%) followed by deep neck space abscess (10%) then laryngeal TB (8.50%), sub-mandibular gland TB (3%) and 1.5% diagnosed with pharyngeal TB. 12.8% of the patients had coexisting HIV infection and 33% patients had associated pulmonary TB. 10

The pattern of lymph node involvement showed multiple lymph node group involvement in 110/120 of the cases in

the present study. The diagnosis was confirmed by USG neck and FNAC of the neck nodes. FNAC was the diagnostic investigation for the lymph node TB except in some (5) cases in which lymph node biopsy was done. FNAC confirmed the diagnosis in most of the cases which was also confirmed in the study by Chakravorty et al as also by Nalini et al. ^{12,13} Most commonly, patients presented with fever followed by swelling in the neck.

Gupta et al had found smoking as a risk factor, though our study did not find the same. ¹⁴ However, it has been found that smoking could cause a decrease in the immune response of the respiratory tract causing increased activation of latent TB infection. Alcohol intake also did not prove to be a risk factor for extrapulmonary TB in our study, similar to the findings by Yang et al majority of the patients (69%) did not have any of the risk factors. ¹⁵

The 55% of patients showed no co-existing illness, however pulmonary TB was the most common comorbidity among patients. There is no clear and significant association of TB lesions with any other observed parameters either. It was also found that these lesions need not occur secondary to pulmonary TB or coexist with HIV. Studies by Pandurang et al, is in accordance with this finding.¹⁰

Tubercular otitis media is a rare manifestation of TB. ¹⁶ It accounted for 3.33% of EPTB case in the present study. In our study, the case with tubercular otitis media had a finding of recurrent ear discharge, not responding to usual antibiotics, hearing loss with infra nuclear facial palsy. Submandibular gland TB is a rare entity but was found among 2 cases in our study. It was found in the younger age group. Nasal TB is a very rare entity even in countries with high disease load. ¹⁷ We had only two cases over the period of study.

The typical lesion of oral TB is an irregular, superficial or deep, painful ulcer which tends to increase slowly in size. It is frequently found in areas of trauma and may be mistaken clinically for a simple traumatic ulcer or even carcinoma. Most likely, the organisms are carried in the sputum and enter the mucosal tissue through a break in the surface, or hematogenous route, deposited in the submucosa and subsequently proliferate and ulcerate the overlying mucosa. It is suggested that when granulomatous inflammation is confirmed by tissue biopsy, TB should also be one of the differential

diagnoses, especially in countries that still have higher TB incidence. 19

Almost all cases were started on ATT and surgery was considered in those unresponsive to treatment. There is a changing trend in the pattern of head and neck TB and its coexistence with pulmonary TB and HIV, and these lesions can occur independent of the involvement of the lung. Furthermore studies with larger sample size will be required to establish smoking and intoxication with alcohol as established risk factors. Lack of sufficient data for clear gender-wise analysis can be considered as limitation of the present study.

CONCLUSION

lymphadenitis remains the most manifestation in the head and neck region. Various efficient diagnostic techniques such as FNAC are available for the diagnosis of these lesions. It is advisable that TB is considered as a differential diagnosis in case of chronic lymphadenopathy, chronic discharging ears, hoarseness, nasal masses with blood-stained discharge, etc. Our study expands the knowledge base for the assessment and epidemiology of head and neck TB. Changing patterns of presentations of laryngeal, aural and nasal TB was observed in the study. Therefore, it can be concluded that an otorhinolaryngologists must keep TB in mind while dealing with head and neck lesions.

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Institutional Ethics Committee

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