Original Article

DOI: 10.7860/JCDR/2016/17171.7076

# Head and Neck Tuberculosis: Scenario in a Tertiary Care Hospital of North Eastern India

Ear, Nose and Throat Section

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## ABSTRACT

**Introduction:** Tuberculosis has affected mankind since time immemorial and with emergence of AIDS both extrapulmonary and pulmonary tuberculosis presents increased morbidity and mortality along with an increased financial burden upon the developing nations.

**Materials and Methods:** The study is a hospital based observational study of one year duration carried out in the Department of ENT in a tertiary care hospital of North Eastern India.

**Results:** Total of 63 cases were detected. Females comprised 60.3% of the study population as against 39.7% males. Most commonly affected age group were of 15 to 24 years age (57.1%). Cervical tubercular lymphadenitis was the most common lesion 90.5% (57 cases) followed by laryngeal tuberculosis 7.9% (5 cases) and tubercular otitis media with mastoiditis 1.6% (1 case). Level II lymph node was mostly affected either single or in groups (75.4%) followed by level III node (57.9%). Successful outcome of the treatment with Category I regimen was achieved in 96.8% of the cases.

**Conclusion:** Head and neck tuberculosis is not an uncommon disease and though cervical lymphadenitis is the most common presentation, isolated involvement of the larynx, ear and other subsites are not an entirely unknown entity. The clinical presentation of tuberculosis of the head and neck region can be varied and often misleading. It is therefore important for the clinician to be aware of the condition and consider it in their differential diagnosis.

**Keywords:** Cervical lymphadenopathy, Laryngeal tuberculosis, Middle ear cleft, Nasopharynx

## INTRODUCTION

Tuberculosis is one of the oldest diseases of mankind and is a leading cause of human suffering and loss of life. There are nearly 9 million new cases and 2 million deaths from tuberculosis worldwide every year. Lymph node tuberculosis is seen in nearly 35 per cent of extrapulmonary tuberculosis which constituted about 15 to 20 per cent of all cases of tuberculosis. In human immunodeficiency virus (HIV) positive patients, extrapulmonary tuberculosis account for up to 53 to 62 percent cases of tuberculosis [1]. *Mycobacterium tuberculosis* is the most common causative agent in India.

Tuberculosis can affect every organ in the body except nail, hair and teeth. In the head and neck region tuberculosis can affect the lymph nodes, larynx, middle ear, oral cavity and pharynx. Tuberculosis of the head and neck region provides an interesting field of research because of its varied presentations and different sites of involvement. It may often mimic malignancy and misdiagnosed [2] which leads to an unnecessary delay in diagnosis.

The aims and objectives of the study were to study the clinico-pathological profile of various types of tuberculosis of the head and neck region and to assess the response of such patients to Directly Observed Treatment, Short - Course (DOTS) therapy

## MATERIALS AND METHODS

The study was carried out in Department of ENT in a tertiary care hospital in Assam for a period of one year. The type of study was a hospital based observational study.

The study was initiated after the ethical clearance from the institutional ethical committee. The patients were included into the study after obtaining consent and all photographs were taken with consent.

Only newly diagnosed cases of head and neck tuberculosis with or without pulmonary involvement were included in the study. Cases of relapse, failure and defaulters were excluded from the study group. Pregnant women and diagnosed cases of tubercular meningitis were also excluded from the study group.

Diagnosis and treatment was done as per Revised National Tuberculosis Control Programme (RNTCP) guidelines. These patients were then followed up during the treatment period and the outcome analysed.

### Diagnostic algorithm of tubercular lymphadenitis

The definition of patients are according to criteria laid down under RNTCP (painless, enlarged lymph nodes with or without constitutional symptoms such as fever, night sweat, weight loss etc.,).

Lymph node enlargement of > 2 cm in one or more sites, with or without periadenitis, with or without evidence of tuberculosis elsewhere, or presence of an abscess with or without discharging sinus.

### Prescribe a course of antibiotic for two weeks

- If swelling persists investigate further {Fine Needle Aspiration Cytology (FNAC)/ Pus for Acid Fast Bacilli (AFB)/ Mantoux test}
- Diagnosis confirmed if pus/aspirate from node shows:
- 1. Ziehl – Neelsen (ZN) stain positive for AFB and/or
- 2. Granulomatous changes with Langhan's giant cell.
- If FNAC inconclusive, excision/ incision biopsy is advised for confirmation.
- If diagnosis is confirmed start Category I treatment.

## RESULTS

A total of 63 patients were enrolled in the study of which 25 were males and 38 females. All the patients tested negative for HIV and there were no concomitant causes of immune suppression in them. The distribution of the patients on the basis of age groups are shown in [Table/Fig-1]. Nutritional status

| Age Group (in years) | No. of Cases | Percentage of case |
|---|---|---|
| 0 – 14 | 9 | 14.3% |
| 15 – 24 | 36 | 57.1% |
| 25 – 34 | 5 | 7.9% |
| 35 - 44 | 9 | 14.3% |
| 45 - 54 | 3 | 4.8% |
| 55 - 64 | 1 | 1.6% |
| >65 | 0 | 0.0% |

**[Table/Fig-1]:** Distribution on the basis of age group.

| Sex | Cervical tubercular adenitis | | Laryngeal tuberculosis | | Tubercular otitis media with mastoiditis | |
|---|---|---|---|---|---|---|
| | Total no. of cases | % | Total no. of cases | % | Total no. of cases | % |
| Male | 21 | 36.8% | 4 | 80% | 0 | 0% |
| Female | 36 | 63.2% | 1 | 20% | 1 | 100% |
| Total cases (63) | 57 | 90.5% | 5 | 7.9% | 1 | 1.6% |

**[Table/Fig-2]:** Distribution on the basis of type of lesion.

of the patients were assessed taking the Body Mass Index (BMI) into consideration. It was seen that 57.1% (36 patients) were underweight while 41.3% (26 patients) were of normal weight. Only one patient was overweight (1.6%).

Cervical lymph nodes were the most commonly affected (90.5%, 57 cases). There were 5 cases of laryngeal tuberculosis (7.9%) and one case (1.6%) of tubercular otitis media with post auricular mastoid fistula [Table/Fig-2]. Most of the nodes were multiple matted ones (55.55%, 35 patients). Level II cervical nodes were the most common region affected either in isolation or as multiple nodes. The breakup of involvement

| Levels of Lymph Nodes Involved | No. of cases | Percentage |
|---|---|---|
| Level I | 4 | 7.0% |
| Level II | 43 | 75.4% |
| Level III | 33 | 57.9% |
| Level IV | 18 | 31.6% |
| Level V | 5 | 8.8% |
| Level VI | 0 | 0% |
| Level VII | 0 | 0% |

**[Table/Fig-3]:** Distribution on the basis of level of lymph node involvement ( isolated or multiple ).

of various lymph node levels (isolated or multiple) is shown in [Table/Fig-3].

Most of the patients (65.1%, 41 patients) had no history of contact with known case of tuberculosis while 34.9% (22 patients) could give a definite history of contact with tuberculosis. Constitutional symptoms like evening rise of temperature, night sweat, generalized weakness and weight loss were absent in 61.9% (39) patients.

FNAC was diagnostic in 42 cases (73.7%) where epitheloid granuloma and Langhan's cells with or without necrosis was seen. The aspirate from affected lymph nodes did not reveal AFB in most of the cases. Only 23 samples (40.4%) revealed AFB after ZN staining. FNAC was non specific in 15 samples which further required incision/ excision biopsy for diagnosis.

Category I regimen was started for all the cases. At the end of treatment for 6 months 61 patients had complete recovery of their lesions and remained symptom free even three months after completion of treatment. 2 patients did not respond to Category I regimen and were considered failure.

## DISCUSSION

The study was conducted in the Department of ENT and newly diagnosed cases of head and neck tuberculosis were registered. A female preponderance was found in this study (60.3% females, 39.7% males). This is in accordance with most studies where female predominance is found (approx 2:1) [3]. Agarwal et al., also found a higher preponderance of females in his study (42% males vs 58% females) [4]. The most commonly affected group in the study was 15–24 years age comprising of 57.1% (36 cases). In the study conducted by VK Arora et al., most affected age group was from 15–24 years age which constituted 38% of the total cases [5].

Nutritional status was measured taking into account the BMI of the patient and it was found that most of the patients (57.1%, 36 cases) were underweight with a BMI value less than 18.5 kg/ $m^2$. Only 41.3% (26 cases) of the total cases were of normal weight and 1.6% (1 case) was overweight. The association of BMI with tuberculosis is not known but Khan A et al., in their study have indicated that undernourished individual with BMI less than 18.5kg/$m^2$ have 22.3% chance of relapse of the disease as compared with individuals with BMI more than 19kg/$m^2$ where the chance of relapse after treatment is 9.3% [6]. In the same study they suggest that a failure to gain weight to more than 5% of pretreatment level could be taken as a marker of increased disease activity and/ or poor response to antitubercular therapy. Our study being conducted over a very short duration long term follow up has not been possible and as such the correlation of BMI with relapse of treated cases cannot be commented upon.

Cervical tuberculosis remains the most common form of head and neck tuberculosis as has been found in various studies with figure ranging from 60% to 90% [7,8]. Kishore C Prasad et al., in their retrospective study of 165 cases over a period of 10 years found laryngeal tuberculosis in 14.5% of the cases and tubercular otitis media in 2.4% of the cases [9].

Tuberculosis of the cervical lymph nodes usually present as a slowly progressive, painless enlargement of the lymph nodes of the neck [Table/Fig-4]. Of all the cervical lymph node swellings level II was most commonly affected, 75.4% of the cases (43 cases) had involvement of level II either alone or in association with other levels. Level III followed next in 57.9% of the cases (33 cases), level IV was involved in 31.6% cases (18 cases) and level V involvement was noted in 8.8% (5 cases ). Level VI and VII were not affected at all. Of these single discreet nodes were present in 38.6% of the cases (22 cases out of 57 neck node swellings) while 61.4% of the cases (35 cases) there were multiple matted nodes involving more than one lymph node level. In concordance with various studies tubercular lymphadenitis



**[Table/Fig-4]:** A patient with cervical lymph node tuberculosis. **[Table/Fig-5]:** Laryngeal tuberculosis affecting left vocal cord. **[Table/Fig-6]:** Post auricular mastoid fistula in a patient with tubercular otitis media of right ear.

| | Sputum for AFB | | CXR | |
|---|---|---|---|---|
| | No. of patients | Percentage | No. of patients | Percentage |
| Positive | 2 | 3.2% | 6 | 9.5% |
| Negative | 61 | 96.8% | 57 | 90.5% |

**[Table/Fig-7]:** Table showing no. of sputum positive cases and chest x-ray findings (active or past infection).

present as multiple matted node most commonly [10]. Dharma Baskota et al., found in their study that level V node was most commonly involved (51%) while BC Jha et al., found upper deep jugular nodes to be most commonly affected [10,11].

Laryngeal involvement was almost always secondary to advanced pulmonary tuberculosis in the past. It mostly affected adolescents of 20-30 years age group. However, in the present day scenario the pathogenesis of laryngeal tuberculosis has undergone a changing trend and cases of primary laryngeal tuberculosis are frequently reported [12]. All the patients of laryngeal tuberculosis in this study had persistent hoarseness as the presenting complaints. The laryngeal lesions in these patients ranged from ulceration over single or both vocal cords or epiglottis ulcer or ulceration over the aryepiglottic folds [Table/Fig-5].

Tuberculosis of the middle ear cleft is a very rare entity and its incidence was found to be 0.05% during the period of 1950-1959 [13]. It occurs primarily by haematogenous spread. It may also be secondary to pulmonary tuberculosis due to entry of the tubercle bacilli through the Eustachian tube during regurgitation, cough or sneezing [13]. The case of tubercular otitis media in this study presented with persistent foul smelling and painless mucopurulent discharge with a central perforation and pale looking middle ear mucosa. The patient also developed a nonhealing postauricular fistula following development of a post auricular subperiosteal abscess over the mastoid antrum which ruptured and drained spontaneously [Table/Fig-6]. Diagnosis was made in this case by the presence of numerous acid fast bacilli in the middle ear discharge.

Involvement of oral cavity in tuberculosis is very rare. This is probably due to the protective role of the saliva. The thickness of the epithelium and the presence of saprophytes and the relative resistance of the striated muscles to bacterial invasion also contribute to this protective mechanism [14]. Isolated nasopharyngeal tuberculosis and primary oro pharyngeal tuberculosis are rare and are almost a forgotten entity. Primary nasopharyngeal involvement probably occurs due to reactivation of dormant acid fast bacilli in the adenoids. Direct mucosal involvement after inhalation of the bacilli may also be a possible mechanism of infection of primary nasopharyngeal tuberculosis [15,16]. Tuberculosis of the thyroid is also an extremely rare entity probably due to the bacteriocidal action of the colloid, good vasculature of the gland and anti tubercular action of the hormones [17]. Symptoms at presentation are nonspecific and patients may present with solitary thyroid nodule. There are reports of thyroid tuberculosis which were misdiagnosed as adenoma or carcinoma initially [17]. There was no case of oral, oropharyngeal, nasopharyngeal tuberculosis or thyroid tuberculosis in this study. However in clinical practice one should be aware of these rare entities and rule them out when there is a clinical suspicion.

An 8% of the patients (5 cases) presented as outpatient basis within one month of onset of symptoms while majority i.e. 60.3% (38 cases) presented 1-3 months of onset of symptoms. A significant proportion of the patients 20.6% (13 cases) presented within 4-6 months of onset of symptoms while 7 cases (11.1%) presented after 6 months of onset of symptoms.

FNAC is an easy and relatively cost effective diagnostic modality in case of lymphadenitis and incision biopsy was required only in doubtful cases. In this study FNAC was diagnostic in 73.7% of the cases presenting with lymph node swelling (42 cases out of 57 cases of cervical adenitis). The most consistent diagnostic feature was that of an epitheloid granuloma with Langhan's giant cell with or without evidence of necrosis. AFB by ZN stain could be demonstrated in 23 of the 57 cases who underwent FNAC (40.4%). Cases of tubercular laryngitis were diagnosed by histopathological study after punch biopsy obtained through direct laryngoscopy. Tubercular otitis media was diagnosed by the presence of acid past bacilli in the specimen of pus obtained from the middle ear cleft. Malakar et al., also found in their study that FNAC was sensitive to detect tubercular lymphadenopathy in 79.1% of the cases [18]. In the same study 41.6% of the patients with tubercular lymphadenopathy, the aspirates were positive for AFB. Chand et al., and SK Lau et al., in their study also reported AFB in aspirates to be 44.5% and 37% respectively [19,20]. FNAC with ZN staining can be used as a first line investigation in cases of lymphadenopathy [19]. Kishore Reddy et al., in their study found about 8% of aspirates from lymph nodes that were negative for the cytology but positive for mycobacterial culture [21]. This assumes importance in HIV positive patients where the cytology may be negative due to impaired immune response [21]. It may thus be worthwhile to include mycobacterial culture along with cytology or histology in order to attain a higher and more specific diagnosis. Early and accurate diagnosis of extrapulmonary tuberculosis has been an area of active research and various serological tests are described in the literature [22,23]. However, the World Health Organisation (WHO) currently recommends against use of such serological test for diagnosis of tuberculosis as they provide inconsistent estimates of sensitivity and specificity [24]. Immunohistochemical tests using MPT 64 mycobacterial antigen have been evaluated in a pilot study by Purohit et al., and have been found to be highly sensitive and specific for *Mycobacterium tuberculosis* infection [25]. Its application in routine clinical practice is still awaited.

Contact history with a diagnosed case of tuberculosis was present in 34.9% of the cases (22 cases) while in majority of the cases (41 cases, 65.1%) it was absent. However, Al Serhani M in his study found positive contact history in only 6.7% of the cases [26]. Constitutional symptoms were present in 38.1% of the cases (24 cases) while it was absent in 61.9% of the cases (39 cases) as against 36%, 26% and 29% in studies conducted by Agarwal et al., Menon K et al., and N Choudhury et al., respectively [4,8,27]. It can be concluded from these data that presence or absence of constitutional symptoms or contact history cannot be relied upon as a reliable diagnostic clue in cases of extrapulmonary tuberculosis of the head and neck region.

Sputum for AFB was positive in 3.2% of the cases (2 cases) while in majority 96.8% (61 cases) it was negative. There was radiological evidence of pulmonary tuberculosis in 9.5% of the patients ( 6 cases ) while in 90.5% of the cases (57 cases) there was no radiological evidence of past or present infection [Table/Fig-7].

While assessing the response to Category I (DOTS) regimen, it was found to be effective and 96.8% (61 cases) showed favourable response at the end of 6 months. There were only two failures (3.2%) and both were cases of cervical adenitis. There were no defaulters in this study. A minimum of three months follow up was done in successfully treated cases. All these patients were disease free at the end of follow up period. VK Arora et al., found successful response with Category III regimen in about 94% [4]. Jain NK et al., in their study found a success rate of 71.8% with Category III and category I regimen [28]. Presently all cases of newly detected extrapulmonary tuberculosis needs to be treated with Category I regimen as per the recommendations of WHO [29]. Six months anti tubercular therapy is the standard protocol as per guidelines of RNTCP and studies have shown no difference in cure rates or relapse rates between 6 and 9 months therapy [30]. Paradoxical upgrading reactions (PUR) has been reported in 20-23% of HIV negative patients after initiation of ATT [30]. However, there were no such reactions in this present series. Steroids have often been used to control the PUR. However, studies have revealed that steroids have no role as

prophylactic measures to prevent PUR or reduce the duration of PUR. The role of surgical treatment in tuberculosis of head and neck region is limited and not well defined and should be considered as an adjunct to anti tubercular therapy for disease caused by drug resistant organisms [30].

## CONCLUSION

Tuberculosis of the cervical lymph nodes is a common disease. However, at times diagnosis of tuberculosis of other sites like larynx, middle ear cleft, thyroid and pharynx can be challenging and delayed due to rarity of involvement. The clinical presentation of tuberculosis of the head and neck region can be varied and often misleading. It is important for the clinician to be aware of the condition and consider it in their differential diagnosis. Accurate and specific diagnostic tests that can detect the disease early is the need of the hour. This is more so in country like India where the prevalence of tuberculosis is high and HIV co infection is on the rise.

## ACKNOWLEDGEMENT

We would like to thank Late Professsor (Dr.) DN Bhattacharjee for his valuable assistance during the course of the study.

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**FINANCIAL OR OTHER COMPETING INTERESTS:** None.

Date of Submission: **Oct 05, 2015**
Date of Peer Review: **Nov 13, 2015**
Date of Acceptance: **Dec 02, 2015**
Date of Publishing: **Jan 01, 2016**