

## Epidemiological considerations and clinical features of ENT tuberculosis

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### Abstract

Between 1 April 1996 and 30 June 1997, 1003 ear, nose and throat (ENT) outpatients and 340 inpatients diagnosed as having pulmonary tuberculosis were analysed for ENT manifestations of tuberculosis to determine the relationship to sputum positivity, whether any high risk factors exist for the ENT manifestations as compared to other pulmonary tuberculosis patients, and the response to anti-tubercular treatment. The commonest ENT manifestation was found to be laryngitis (seven cases), which was more common in pulmonary tuberculosis patients (five out of seven), all except one of whom were sputum negative. All of these patients were defaulters from anti-tuberculosis treatment or relapse cases, and vocal cords were the commonest site of involvement. One case of tuberculous tonsillitis and one case of tuberculous mastoiditis were also noted. The practical implications of an awareness of ENT tuberculosis is a benefit of anti-tubercular therapy and hence conservative management usually suffices.

**Key words:** Otorhinolaryngological Diseases; Tuberculosis

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### Introduction

Tuberculosis remains a major source of morbidity and mortality in our country. In recent years, even countries which were once considered safe have reported this disease. Tuberculosis infection in patients with HIV infection is also posing a problem. Care for tuberculosis patients has largely shifted from specialized institutions to the general medical community. Our hospital, started in 1925, is one of the oldest tuberculosis sanatoria in the country and hence this study was possible.

Also, the threat of multi-drug resistant tuberculosis looms large. Tuberculous laryngitis is the commonest ENT manifestation, readily amenable to anti-tuberculous therapy. The other ENT manifestations such as tuberculous mastoiditis and tuberculous tonsillitis are rare. Few Indian data are available regarding ENT manifestations of tuberculosis.

With the changing features of this disease, the ENT manifestations as described in textbooks appear to be changing. Hence, this study was undertaken to consider the present day scenario of this disease. An awareness of this is essential in view of the dwindling number of tuberculosis sanatoria and an increased possibility of such cases being encountered in practice.

### *Aims and objectives*

- (1) To determine the prevalence of ENT manifestations in diagnosed pulmonary tuberculosis patients.
- (2) In cases of pulmonary tuberculosis, to determine the relationship of ENT manifestations and sputum positivity as compared with pulmonary tuberculosis cases without ENT manifestations.
- (3) To determine whether any high risk factors exist for patients with ENT manifestations as compared with other patients of pulmonary tuberculosis.
- (4) To determine the prevalence of ENT manifestations without pulmonary tuberculosis.
- (5) To determine the response to anti-tuberculosis therapy.

### Materials and methods

Between 1 April 1996 and 30 June 1997, two sets of patients were included in this study: (1) all patients who attended the ENT outpatient department of this hospital and (2) patients admitted to the tuberculosis ward of this hospital, diagnosed with pulmonary TB. The diagnosis of tuberculosis was made as per the Revised Strategy of the National Tuberculosis Control Programme of India. The medical records of these patients were reviewed and analysed in detail for ENT manifestations.

A further 100 randomly selected (by the method of simple random sample without replacement) records of pulmonary tuberculosis inpatients (i.e. those who did not have any ENT symptoms) were evaluated for sputum status, involvement of extra-pulmonary sites, previous treatment status (i.e. whether relapse, treatment default or fresh case) and for the presence of any predisposing factors. This was done to enable a comparison of the above factors with those of pulmonary tuberculosis with ENT manifestations.

All cases diagnosed as tuberculosis underwent the following investigations:

(a) *In all patients*

- (1) Haemogram and routine urine examination
- (2) Blood sugar – fasting and post-prandial
- (3) HIV testing, after patient counselling and consent
- (4) Sputum for AFB (ZN staining) – three samples
- (5) Sputum AFB culture
- (6) Liver function tests
- (7) X-ray, chest PA view

(b) *In ENT cases*

- (1) Ear discharge for Gram stain, AFB stain, routine culture and AFB culture.
- (2) Histopathology if necessary

Direct laryngoscopy and biopsy were done in two cases of suspected laryngeal tuberculosis. In both these cases biopsy was done to rule out malignancy. The diagnosis of tonsillar tuberculosis was made on histopathology after tonsillectomy.

Anti-tuberculosis treatment was started as per the revised National Tuberculosis Control Programme under the guidance of a chest physician. The treatment for laryngeal tuberculosis, in addition to anti-tuberculosis therapy included voice rest and steam inhalations. No steroids were given. No case of tuberculous cervical lymphadenopathy or vocal fold palsy due to lung destruction was included in this series.

## Results

A total of 1003 ENT outpatients and 340 diagnosed pulmonary tuberculosis inpatients were analysed for ENT manifestations of tuberculosis (Table I). The most common ENT manifestation was laryngeal tuberculosis (Table II) which was more common in diagnosed pulmonary tuberculosis patients (Table III). Laryngeal tuberculosis was more common in patients who were defaulters of previous anti-tuberculous therapy or relapse cases (Table IV). Chronic alcoholism was the commonest predisposing factor. This was similarly observed even in pulmonary tuberculosis patients without ENT manifestations (Table V). All except one patient of laryngeal tuberculosis were sputum negative (Table VI).

## Discussion

The commonest ENT manifestation was tuberculous laryngitis. A higher prevalence of this condition

TABLE I  
NUMBER OF CASES

Pulmonary TB inpatients	340
ENT outpatients	1003
Total	1343

TABLE II  
ENT MANIFESTATIONS

Laryngeal tuberculosis	7
Tuberculous mastoiditis	1
Tuberculous tonsillitis	1

TABLE III  
LARYNGEAL TUBERCULOSIS

In diagnosed pulmonary TB patients	5
In ENT outpatients	2

TABLE IV  
PREVIOUS TREATMENT STATUS

	PTB (pulmonary tuberculosis)	PTB with laryngeal manifestations
Default	43%	60% (3/5)
Relapse	26%	40% (2/5)
Fresh cases	31%	–

TABLE V  
PREDISPOSING FACTORS

	PTB (pulmonary tuberculosis)	PTB with laryngeal manifestations
Diabetes mellitus	8%	0
HIV infection	9%	20% (1/5)
Chronic alcoholism	46%	40% (2/5)

TABLE VI  
LARYNGEAL TUBERCULOSIS AND SPUTUM AFB

	PTB (pulmonary tuberculosis)	PTB with laryngeal manifestations
Sputum positive	25%	20% (1/5)
Sputum negative	75%	80% (4/5)

among diagnosed cases of pulmonary tuberculosis was noted as compared with ENT outpatients.

The commonest predisposing factor for tuberculosis was found to be chronic alcoholism. Known predisposing factors are diabetes and HIV infection. One case of HIV infection was present. Probably the first report of laryngeal tuberculous in HIV infected patients was published in 1996 by Singh *et al.*<sup>1</sup> A 100 per cent posterior laryngeal involvement with a carcinoma-like appearance was noted. However, the single patient with HIV infection and laryngeal tuberculosis showed vocal fold involvement only. No posterior laryngeal involvement was noted. An interesting observation in this study was that all patients with pulmonary tuberculosis and laryngeal manifestations were found to be either defaulters of anti-tuberculous treatment or relapse cases. To our knowledge, this predisposition has not been observed in any of the previous studies. This has a very important role in the genesis of drug resistant tuberculosis. The condition develops when the right anti-tuberculous treatment drugs are not taken on a consistent basis nor for the advised duration. Multi-drug resistant tuberculosis poses one of the biggest



FIG. 1

Tuberculous epiglottitis. Endoscopic view showing thickened epiglottis (taken with the help of a gastro-enterologist from another hospital with this facility for documentation purposes)

problems to tuberculosis because it carries a high mortality. Also, the cost of treatment increases, an important consideration in developing countries.

In diagnosed pulmonary tuberculosis patients the commonest presenting feature was hoarseness of voice, noted in all cases.<sup>2-4</sup> Odynophagia as a presenting feature was noted in one patient only in this series. Breathlessness was not a presenting feature in any of our patients. Formerly, posterior laryngeal involvement was more common due to the recumbent position enabling pooling of sputum in posterior larynx, the advanced stage of the disease and sputum positivity. However, vocal fold involvement was the commonest finding noted in this series. Ulcerative lesions of membranous parts of the true vocal folds were seen. In addition, inter-arytenoid granulations in one patient were noted. One of the two cases diagnosed from among the ENT out-patients had epiglottis involvement (Figure 1). Soda *et al.*,<sup>5</sup> in an analysis of clinical aspects of tuberculosis of the larynx, also reported a predominant anterior laryngeal involvement. This they attributed to ambulatory treatment regimens and a predominance of lymphatic and blood stream spread. A high



FIG. 2

Histopathological section of tuberculous epiglottitis, long arrow shows pseudo-epitheliomatous hyperplasia (i.e. proliferation of lining epithelium) simulating malignancy. Tubercles are also seen (H&E;  $\times 100$ ).

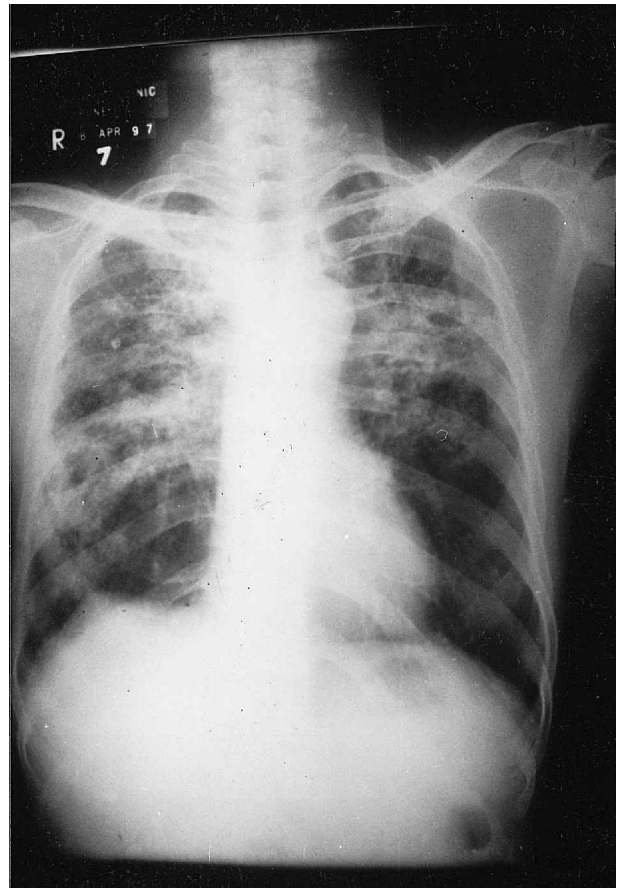


FIG. 3

Photograph of X-ray of chest, PA view, of patient of tuberculous mastoiditis, showing in both the lungs fibrotic scars and patchy consolidation in upper and mid zones.

incidence of vocal fold involvement has also been reported in earlier studies.<sup>3,4</sup> In this series, no case of vocal fold palsy due to tuberculous laryngitis was encountered.

An interesting observation made in this study was that all except one patient with tuberculous laryngitis and pulmonary TB were sputum-negative for acid-fast bacilli. One of the possible reasons for this could be that all these patients were previous anti-tubercular therapy defaulters or relapse cases,

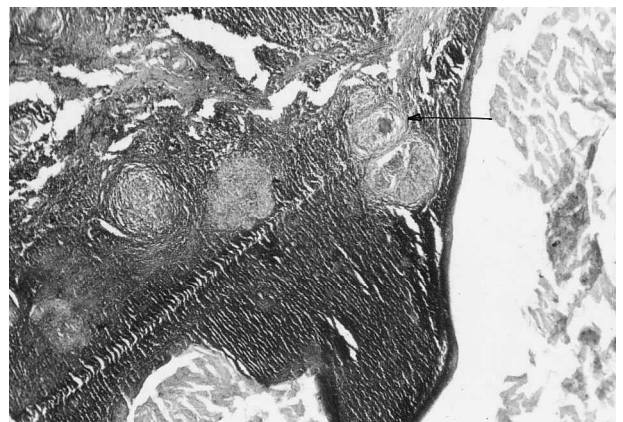


FIG. 4

Tubercular tonsillitis. Arrow shows tubercular granulomas (H&E;  $\times 40$ )



where previous incomplete treatment could have caused the sputum conversion. However, the details of the previous therapy were not available in all cases to confirm or otherwise this possibility.

Many of the studies conducted in developed countries have discussed the role of biopsy for diagnosis. Vidal *et al.*<sup>6</sup> noted that, as co-existence of laryngeal tuberculosis and carcinoma is exceptional when laryngeal symptoms are present with active pulmonary tuberculosis, laryngeal biopsy is to be undertaken in those with lymph node enlargement, risk factors, or when symptoms persist after a correct therapeutic regimen has been instituted. Manni<sup>7</sup> in an analysis of laryngeal tuberculosis in Tanzania, opined that if a patient with pulmonary TB complained of hoarseness of voice, then concomitant tuberculous laryngitis is to be considered the first possibility.

In this series, the diagnosis of laryngeal tuberculosis was made on indirect laryngoscopic appearances in diagnosed cases of pulmonary tuberculosis. Malik *et al.*<sup>8</sup> have discussed the diagnosis of laryngeal tuberculosis on morphological features in sputum-positive cases. In two cases with a doubtful appearance and a clinical suspicion of malignancy a direct laryngoscopy and biopsy were performed (Figure 2). The response to anti-tuberculous treatment proved to be another important diagnostic criterion.

The ideal method of diagnosis of suspected laryngeal TB would be a flexible fibre-optic laryngoscopy and biopsy. However, this was not possible in our general hospital set-up.

The other ENT manifestation of tuberculosis encountered was tuberculous mastoiditis. There was one patient with this condition among the diagnosed pulmonary tuberculosis inpatients (Figure 3). It was diagnosed clinically by pale granulation tissue and severe deafness (sensorineural). Biopsy could not be undertaken for histopathology as this patient was admitted for Isonicotinic acid hydrazide, commonly known as Isoniazid, (INH) psychosis. Mastoid involvement occurs via the bloodstream.

The hallmark of tuberculous otitis media is multiple perforations of the tympanic membrane, the incidence of which is reported to be low. No case of multiple perforations of the ear drum was encountered. Two cases of subtotal perforations of the tympanic membrane in diagnosed cases of pulmonary tuberculosis were seen. The ear discharge staining and culture for AFB was negative, and both these patients responded to the antibiotic instituted according to the routine culture and sensitivity report.

One of the sites of primary tuberculosis described is tonsil. With pasteurization of milk, the worldwide prevalence of this appears to have reduced. Secondary tuberculosis associated with pulmonary tuberculosis appears to be rare. On reviewing recent literature, a few isolated case reports of tonsillar tuberculosis exist. In this series, there was only one case of tonsillar tuberculosis (Figure 4). The next 17

tonsillectomy specimens were sent for histopathology, but were negative for tuberculosis. This highlights the rarity of this condition in the present day.

No case of tuberculous involvement of the nose, paranasal sinuses or oesophagus was encountered in this series.

### Conclusions

- (1) The commonest ENT manifestation of tuberculosis was tuberculous laryngitis.
- (2) Tuberculous laryngitis was more common in diagnosed pulmonary tuberculosis patients; all except one were sputum-negative.
- (3) The predisposing factor noted for tuberculous laryngitis in diagnosed pulmonary tuberculosis patients was anti-tuberculous therapy default or relapse.
- (4) In all these patients vocal fold involvement was noted.
- (5) With laryngeal pathology and pulmonary tuberculosis, the diagnosis of tuberculous laryngitis, in our country, may be made on the appearance of laryngeal lesions on indirect laryngoscopic examination.

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