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ENT manifestation CCs in tuberculosis: a descriptive study

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Abstract

Background: An attempt was made to study ENT manifestations in tuberculosis.

Material and methods: A descriptive study was carried out among 200 patients with ENT manifestations of tuberculosis attending various departments at a government medical college hospital. Patients will be evaluated and followed up according to protocol. All patients diagnosed with tuberculosis were treated, according to the recent RNTCP guidelines using the CBNAAT testing.

Results: In the present study, 66% of patients with tuberculosis of the ear, nose, and throat region were females. Seventy-five percent of patients with tuberculosis of ENT and neck region were between the age group of 11 and 40 years. Cases of tubercular lymphadenitis (89.5%), tubercular laryngitis (4.5%), tubercular otitis media (3%), TB of the oral cavity (2%), and TB of the nose (1%) were seen. Painless lymph node enlargement was found in 91.62% of cases. Lymph node enlargement, hoarseness of voice, painless profuse otorrhoea, hearing loss, nasal obstruction, rhinorrhea, odynophagia, ulcers in the oral cavity, and tonsil enlargement were seen in patients of respective ENT tuberculosis. Concomitant pulmonary TB was found in 8.37% of cases of cervical TB, 100% of cases of laryngeal TB, 50% of cases of TB otitis media, 75% of cases of oral TB, and 50% of cases of nasal TB. Biopsy and CBNAAT have a promising role in tuberculosis management.

Conclusion: Early diagnosis of tuberculosis in ENT requires a high index of suspicion for patients non-responding to routine treatment

Keywords: Extra-pulmonary TB, Cervical lymphadenopathy, Tuberculosis laryngitis, Tuberculosis otitis media, Nasal tuberculosis

Key message

Early diagnosis improves tuberculosis morbidity and mortality.

Background

In the modern era of medicine, tuberculosis still continues to be responsible for the death of millions of people throughout the world every year. In the End TB strategy, specific targets set for 2030 are a 90% reduction in the absolute number of TB deaths and an 80% reduction in

TB incidence [1]. Concomitant pulmonary TB was seen in 25–30% of ENT tuberculosis [2]. Since extra-pulmonary tuberculosis has such a wide range of presentations, a clinician should keep a high suspicion for diagnosing these cases properly. Cartridge-based nucleic acid amplification test (CBNAAT) is useful to diagnose TB and rifampicin resistance within 2 h. CBNAAT is 93.42% sensitive and 86.96% specific and has a positive predictive value of 95.95%. CBNAAT is more sensitive than any other investigation, especially in cases of tubercular lymphadenitis [3]. A patient with both pulmonary and EPTB is classified as a case of PTB1. According to the latest guidelines, the treatment of EPTB in the head and neck region is to be treated with 2RHZE/4–7RHE for 6 to 9 months. All cases involving the bone such as

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TB otitis media should receive 9 months of treatment [4]. According to Stani et al., AKT is the cornerstone of the management of EPTB [5]. The variable nature of its manifestations as well as its ability to involve almost every organ individually or multiply, make it essential to the possibility of tuberculosis infection in other rare sites. Therefore, the aim of the present study is to diagnose the disease early and prevent its complications with early and appropriate management for recovery without morbidity. As it has aptly been said that tuberculosis is like a serpent that crawls through the mud, but the mark persists, even after the serpent has vanished. The anatomy once deranged by tuberculosis never returns to normal.

Methods

The present study is a descriptive study, which was done at the Department of ENT, Government Medical College & Tertiary Care Centre from Dec. 2017 to Nov. 2019. A total of 200 patients were included in the study. The Ethics Committee of Tertiary Care Centre & Government Medical College approved the study. Data was collected from patients with ENT manifestations of tuberculosis. Patients with tuberculosis in the head and neck regions were included in the study. Patients with only pulmonary tuberculosis, HIV, diabetes mellitus, and known renal and heart diseases were excluded from the study.

The patients were evaluated according to protocol. A detailed history of the patient was entered in Performa. Complete hemogram, ESR, and chest X-ray were done immediately upon presentation. The ultrasound of the local area was done routinely for patients presenting with swelling over the head and neck regions. Any discharge if present or patients with symptoms of cough with expectoration pus and/or sputum sample was sent to Mycobacterium detection via Zeil Neelson staining and CBNAAT technique. In the patients with neck swellings, FNAC or biopsies from the nodes were taken with prior informed

consent and sent for histopathology and CBNAAT. For CBNAAT, the sampling reagent was added at a 2:1 ratio to the pus or aspirate from cervical swelling, kept for 15 min at room temperature with intermittent shaking, then transferred to the cartridge and the cartridge was inserted in the module of the CBNAAT machine.

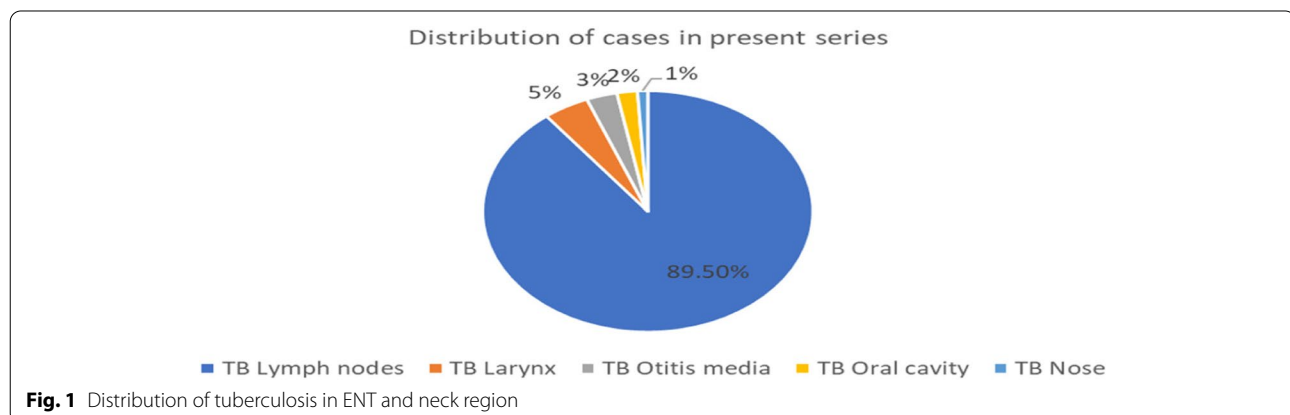
All information regarding the study was given to the patients or their valid guardians. Informed written consent for willingness to participate in the study was taken from the patients or their guardians. Data collection sheets were filled. Patients were treated according to the RNTCP guidelines

Results

Among 200 patients of tuberculosis of ENT and neck region, 179 cases (89.5%) had tuberculosis lymphadenitis, 4.5% had TB laryngitis, 3% patients had TB otitis media, 2% patients had TB oral cavity, and 1% had TB of the nose (Fig. 1). Sixty-six percent of females were affected with tuberculosis of the ear, nose, and throat regions (Fig. 2). Seventy-five percent of patients were between 11 and 40 years of age (Table 1).

Tuberculosis cervical lymphadenitis

Tuberculosis still remains the most common cause of cervical lymphadenitis (89.5%). It was predominantly seen in younger age, the maximum incidence being at the age group of 21–30 years (Table 1). In the present series, male to female ratio was 1:2.14 (Fig. 2). 68.16% of cases of cervical lymphadenitis were presented within 3 months of symptoms. Clinical presentation in patients with tuberculosis lymphadenitis was shown in Table 2 and Fig 3. Painless lymph node enlargement was found in 92% of the cases, and pain was reported in 8% of the cases may be due to secondary bacterial infection or inflammatory changes. Clinical signs in patients with TB lymphadenitis were shown in Table 3. A family history of tuberculosis



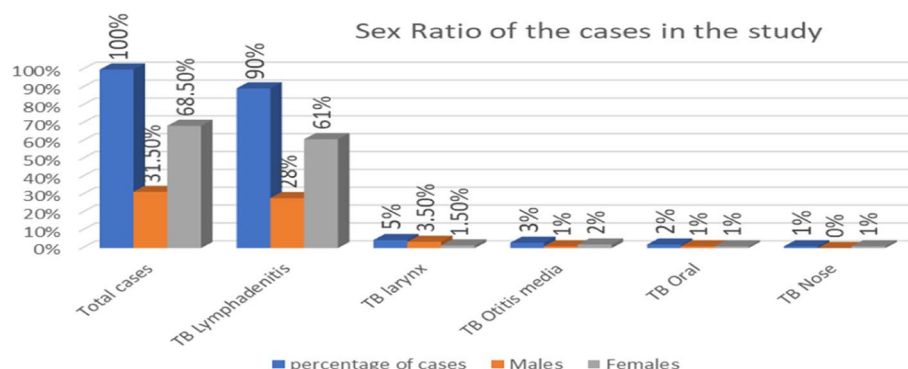


Fig. 2 Sex ratio of tuberculosis in ENT and neck region

Table 1 Distribution of ENT and neck tuberculosis cases according to age

Sr. no.	Age in years	Total	TB lymphadenitis	TB laryngitis	TB otitis media	TB oral cavity	TB nose cavity	(%)
1	0 to 10	07	06	0	1	0	0	3.5
2	11 to 20	42	39	0	3	0	0	21
3	21 to 30	63	58	01	2	1	1	31.5
4	31 to 40	45	40	02	0	2	1	22.5
5	41 to 50	29	24	04	0	1	0	14.5
6	51 to 60	11	09	02	0	0	0	5.5
7	61 to 70	03	03	00	0	0	0	1.5

Table 2 Symptoms in patients' cases with TB lymphadenitis

Sr. no.	Symptoms	No. of cases (%)
1.	Lymph node symptoms	179 (100%)
A.	Painless enlargement	164 (91.62%)
B.	Painful enlargement	15 (8.37%)
2.	Tubercular toxemia symptoms	121 (67.60%)

was found in 12 cases (6.7%) and 12 cases (6.70%) gave a history of tuberculosis. X-ray chest was showing cavity and/or hilar enlargement in 15 patients. Tuberculosis was diagnosed with CBNAAT in 77% of patients. Diagnosis of tuberculosis was done with the investigations shown in Table 4.

Laryngeal tuberculosis

In the present study, nine cases (4.5%) had laryngeal tuberculosis. As shown in Table 1, patients with laryngeal tuberculosis were predominantly of late middle age. Eighty-five percent of patients were among the 31–60-year age group. Male to female ratio in laryngeal tuberculosis was 7:2 (Fig. 2). All the patients with laryngeal tuberculosis complained of hoarseness of

Child with right cervical lymphnode with left postauricular abscess formation

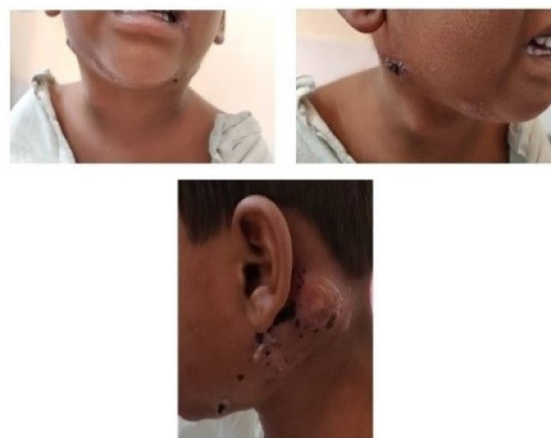


Fig. 3 Tuberculosis cervical lymphadenitis

voice and cough with expectoration (100%), and dysphagia and odynophagia were seen in two patients, respectively (22.22%). Dyspnea was seen in five patients (55.55%). Two patients with laryngeal tuberculosis were

Table 3 Clinical signs in the patients with TB lymphadenitis

Sr. no.	Presentation	No. of cases (%)
1.	Hyperplasia	63 (35.19%)
2.	Matting	106 (59.22%)
3.	Abscess	4 (2.23%)
4.	Sinus	3 (1.68%)
5.	Ulcer	2 (1.12%)
6.	Collar stud abscess	1 (0.56%)

presented with hemoptysis (22.22%), and seven patients had a history of evening rising fever (77.77%). Loss of weight and loss of appetite was seen in six patients (66.66%) with laryngeal tuberculosis and relatively few complained of other laryngeal symptoms. Coexistent pulmonary disease may be accounted for dyspnoea and symptoms of tubercular toxemia.

Tuberculosis involved more than one site, simultaneously, in a single patient, and each part too showed a varied presentation in a single case (Fig. 4). The lesions seen in patients at different sites were shown in Table 5. The onset of laryngeal tuberculosis was usually accompanied by an advanced stage of tuberculosis. The evidence of pulmonary tuberculosis in patients with laryngeal tuberculosis was shown by a history of pulmonary TB in eight cases (88.88%), a family history of TB was seen in one patient (11.11%) and systemic evidence of tuberculosis was seen in five patients (55.55%). The investigations done to diagnose tuberculosis were shown in Table 5.

Pale granulations with AE fold edema

**Fig. 4** Laryngeal tuberculosis

Middle ear tuberculosis

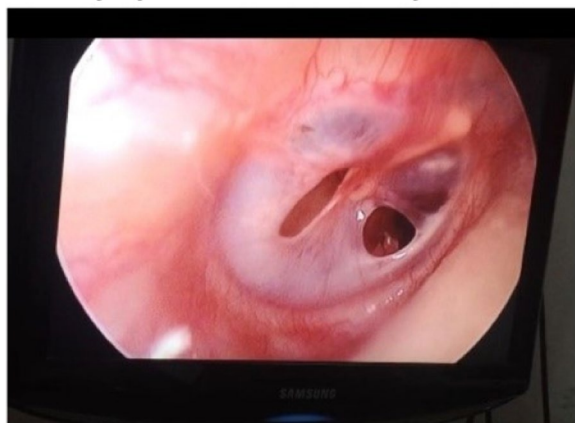
In the present study, 3% of cases were of middle ear tuberculosis. The age incidence of TB otitis media is shown in Table 1. 83.33% of cases of tuberculosis otitis media were between the age group of 11 to 30 years. In the present study, the male to female ratio in tuberculosis otitis media was 1:2. Painless profuse otorrhea and hearing loss were seen in all (100%) patients. Other symptoms such as tinnitus (50% of patients), vertigo (16.67% of patients), and earache (16.67% of patients) were seen in the patients with tuberculosis otitis media. In the present study, three patients were concomitant pulmonary tuberculosis; therefore, the symptoms of tubercular toxemia such as cough with expectoration (50%), fever (50%),

Table 4 Analysis of investigation in ENT and neck tuberculosis cases

Sr. no.	Investigation	TB lymphadenitis, % (cases)	TB laryngitis, % (cases)	TB otitis media, % (cases)	TB oral cavity, % (cases)	TB nasal cavity, % (cases)	Total cases diagnosed (%)
1	Pus for AFB	5.02% (9)	88.88% (8)	100% (6)	75% (3)	50% (1)	27 (13.5%)
2	ESR in mm						200 (100%)
	Below 35	42.46% (76)	22.22% (2)	50% (3)	50% (2)	0	83 (41.5%)
	Below 70	49.16% (88)	55.55% (5)	33.3% (2)	25% (1)	50% (1)	97 (48.5%)
	Below 100	8.38% (15)	22.22% (2)	16.6% (1)	25% (1)	50% (1)	20 (10%)
3	FNAC/biopsy	100.00% (179)	77.77% (7)	33.3% (2)	50% (2)	100% (2)	192 (96%)
4	X-ray chest		100% (9)				34 (17%)
	Cavity	8.37% (15)	55.55% (5)	3 (50%)	2 (50%)	1 (50%)	
	Infiltration	6.7% (12)	22.22% (2)		1 (25%)		
	Hilar enlargement	8.37% (15)	22.22% (2)	1 (16.6%)			
	Pleural effusion		0%				
	Pneumothorax		0%				
5	X-ray mastoid-sclerosis			50% (3)			3 (1.5%)

Table 5 Findings in the patients with tuberculosis of the larynx

Sr. no.	Anatomical site and lesion	No. of cases	Percentage
1	Vocal cord	6	66.66%
	Congestion	4	44.44%
	Ulceration	5	55.55%
	Paralysis	2	22.22%
	Thickening	3	33.33%
2	Interarytenoid region	7	77.77%
	Irregularity	4	44.44%
	Mamillations	6	66.66%
	Ulceration	5	55.55%
3	Arytenoids	3	33.33%
	Pale	2	22.22%
	edema	1	11.11%
	Ulceration	0	-
	Irregularity	2	22.22%
4	Epiglottis (edema)	2	22.22%
5	Ventricular folds (edema)	5	55.55%
6	AE folds	2	22.22%
	Pale	1	11.11%
	edema	2	22.22%

Right ear showing dual perforation of the tympanic membrane in pars tensa**Fig. 5** Tuberculosis of the ear

loss of appetite (33.33%), and weight loss (33.33%) were seen. One patient (16.67%) was associated with grade III LMN facial palsy. Three patients (50%) were presented with multiple perforations in the pars tensa, and among them, two patients were presented with two perforations and one with three perforations, and two patients (33.33%) were with a large perforation of the tympanic membrane (Fig 5). The presence of pale, exuberant granulations was seen in two patients (33.33%); aural polyp

and post-aural sinus formation were seen in one (16.67%) patient. Concomitant pulmonary tuberculosis was seen in three patients (50%) with tuberculosis otitis media. In the remaining three patients (50%) with tuberculosis, the otitis media primary site of tuberculosis was not known. The ear swab and operative material (33%) were found positive in all the cases. In tuberculosis otitis media we preferred to do X-ray mastoid to avoid radiation to the patients and ask a surgeon who has the expertise to do ear surgeries without CT scans. X-ray was done to give information like low-lying dura and pneumatization of mastoid cavity, etc. The X-ray mastoid Schuller's view showed sclerosis of mastoids. X-ray chest was taken to find out co-existent pulmonary tuberculosis.

Tuberculosis of oral cavity

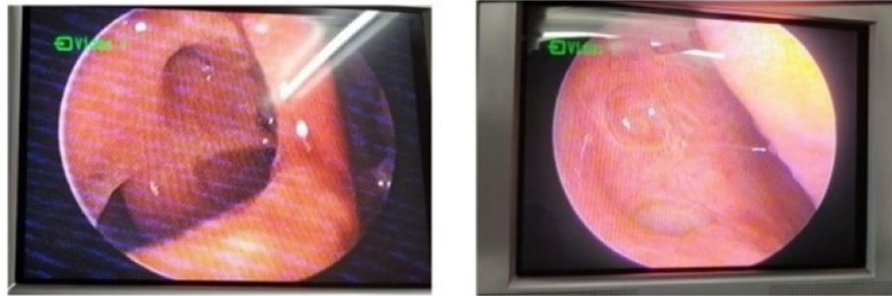
In the present study, 2% of cases were of tuberculosis oral cavity; predominantly in the early middle age. In the present series, tuberculosis of the oral cavity showed an equal incidence in both males and females. Tuberculosis of the oral cavity presented with odynophagia (50% cases), ulcers in the oral cavity (50% cases), and tonsil enlargement (50% cases). Corresponding to the symptoms at the time of reporting, clinical signs seen in the patients were hypertrophy of the tonsils (50% cases), ulcers in the oral cavity (50% cases), and pale granulas over the tongue and buccal mucosa (50% cases). Associated pulmonary tuberculosis was seen in three cases (75%), had sputum examination positive for AFB, and showed evidence of pulmonary tuberculosis on their X-ray, and in the remaining one patient (25%), the primary site of tuberculosis was not known.

A patient who had an ulcer in the oral cavity was diagnosed positive on biopsy, and a patient with a secondary infected node in the neck at level II was positive on FNAC. Diagnosis of oral tuberculosis was done with the investigations shown in Table 4.

Tuberculosis of nasal cavity

Nasal tuberculosis was seen in 1% of cases, in two females of age group 21–31 years. Both nasal tuberculosis patients had associated pulmonary tuberculosis. The patients with nasal tuberculosis were presented with symptoms of nasal obstruction and watery rhinorrhea in all cases (100% of cases). Perforations of the nasal septum, pale granulation over the edges of the perforation, and ulcer in nasal mucosa were seen in 50% of patients with nasal tuberculosis (Fig. 6). One patient (50%) was with pulmonary tuberculosis.

Diagnosis of nasal tuberculosis was done with the investigations shown in Table 4. All patients diagnosed with tuberculosis were started on Anti Tubercular Drugs

Septal perforation with congestion Mucosal pits with pale mucosa**Fig. 6** Nasal tuberculosis

according to the recent RNTCP guidelines and Drug Sensitivity Testing (DST) using the CBNAAT.

Discussion

1.5% of India's population is affected by tuberculosis [6]. Head and neck TB constitutes 10–15% of all EPTB cases with the majority being tuberculosis of the cervical lymph node and less than 1% extra-nodal head and neck TB cases [4].

Tubercular cervical lymphadenitis

In the present study, 89.5% of cases were of tubercular cervical lymphadenitis. In the study done by Das et al., Sriram et al., and Ricciardiello et al., tubercular cervical lymphadenitis was seen in 90.5%, 86.53%, and 94.12% of cases, respectively [7–9]. The present study results were comparable to the previous study results. According to Rahman et al. and Yashveer et al., the age group of 15–24 years had the highest prevalence of tuberculosis lymphadenitis [10, 11]. In the present study group, tuberculosis lymphadenitis cases were more in 21 to 30 years of age group. Yashveer et al. [11], Rahman et al. [10], and Subrahmanyam et al. [12] had shown that females were more affected than males. Similar results were seen in the present study.

The preponderance of female patients may be because of poor nutrition and the prevalence of iron deficiency anemia in females which are associated factors for tuberculosis [13]. In Rahman et al.'s [10] study and Akbar et al.'s [14] study, discharging sinus was seen in 13.5% and 5% cases, respectively. In the present study, discharging sinus was seen in 1.68% of patients which was less than previous study results because of early diagnosis and treatment.

According to Sachdeva et al., neck abscesses were seen in 22.2% and post-auricular abscesses were seen in 11.1% of patients with TB head and neck [15]. In Rahman et al.'s [10] and Yashveer et al.'s [11] study, cold abscess was seen

in 10% of cases. In the present study, cold abscess was seen in 2.23% which was less than Rahman et al.'s [10] and Yashveer et al.'s [11] study that may be because early diagnosis and early start of AKT. According to Yashveer et al.'s study, ESR was more than 30 mm in the first hour in 95.5% of cases and FNAC diagnosed TB in 76.19% of cases [11]. In the present study, ESR was more than 30mm and FNAC diagnosed TB in all cases. According to Akbhar et al., AFB by Z-N staining confirmed the diagnosis in 30% of cases [14]. In the present study, AFB by Z-N staining confirms the diagnosis in 5.02% of cases. Less number of patients were diagnosed with AFB by Z-N staining and was a reflection of a few cases of cold abscesses and discharging sinus. According to Sachdeva et al., CBNAAT was positive in 77.7% of total positive cases of tuberculosis of the head and neck [1]. Similar results were seen in the present study.

Tubercular laryngitis

Laryngeal TB is usually secondary to TB lesions in the lung [16]. The disease is fairly rare today and occurs in less than 1% of tuberculosis cases. The age of the patients ranged from 21 to 53 years. Ricardiello et al. [9] and Agarwal et al. [16] had shown a male preponderance in laryngeal tuberculosis with a mean age of 58 years and 49 years, respectively. In laryngeal tuberculosis, Ricardiello et al. [9] and Devi et al. [17] had found male to female ratio of 12:2 and 23:1, respectively. The present study results were comparable to previous study results.

The male preponderance in laryngeal tuberculosis may be due to more prevalence of risk factors such as smoking and alcohol abuse and voice abuse professionals such as hawkers in men.

Patients with tuberculosis of the larynx presented with hoarseness of voice, odynophagia, dysphagia, cough, otalgia, and stridor [18]. Ulceration of the laryngeal vestibule or perichondritis of the cricoid cartilage leads to dysphagia. In laryngeal TB, the most common symptom

was dysphonia (100%) and the most commonly affected site was vocal folds and vestibular folds [19]. In the present study, hoarseness of voice and cough were the most common symptoms seen in all 100% patients.

According to Devi et al. [17], the anterior part of the larynx, especially the interarytenoid region, was more commonly involved. In the present study, the interarytenoid region was the most common site followed by the vocal cord and ventricular folds. According to Zang et al., ulcerative lesions were more common [20]. Concurrent pulmonary tuberculosis was seen in a higher number of laryngeal tuberculosis patients [20]. Similar results were seen in the present study. According to Ling et al. and Shin et al., laryngeal tuberculosis may occur even without pulmonary tuberculosis [21, 22].

According to Swain et al., histopathology and bacteriology were confirmatory tests for the diagnosis of laryngeal tuberculosis [23]. In the present study, sputum examination was positive in eight cases (i.e., 88.88%) for AFB and histopathology was positive for tuberculosis in 77.77% of cases.

Tubercular otitis media

Tuberculosis otitis media was seen in 0.05–0.9% of all cases of all chronic otitis media [24]. Weiner reports tuberculous otitis media in 0.04% of cases of chronic otitis media [25]. The incidence of tuberculosis otitis media has decreased dramatically after the advent of anti-tubercular medications. Tuberculosis of the middle ear cleft is very rare [5]. According to Nishiike et al. study, males were more affected than females with a ratio of 1.4:1 [26]. According to the study done by Deenadayal et al., the male to female ratio was 0.8:1 [27]. In the present study, the male to female ratio was 1:2, and females were more compared to male patients. According to Cho et al. and Deenadayal et al., the highest incidence of tuberculosis otitis media was around their thirties [27, 28]. In the present study, the highest incidence of tuberculosis otitis media was among 11–20 years followed by 21–30 years of age group.

Tubercular bacilli reach into the temporal bone by aspiration through the Eustachian tube, through the hematogenous spread, or by implantation through the tympanic membrane perforation [29]. Typical features in tuberculosis otitis media include painless otorrhea, large central perforation, or small multiple perforations, pale, abundant middle ear granulations, and severe conductive or profound hearing loss [19]. In the present study, similar features were seen in patients with tuberculosis otitis media.

The incidence of facial paralysis was seen in 1 to 3.5% of patients of non-tuberculosis chronic otitis media with

cholesteatoma and in tuberculosis otitis media; early facial palsy was seen in 20% of cases [29]. It indicates that the incidence of facial palsy is much more in tuberculosis otitis media, and therefore, every patient with chronic otitis media with facial palsy must be ruled out for tuberculosis. In the present study, facial nerve palsy was seen in 16.67% of patients. The incidence of facial palsy was much higher in Susan's series (40%). Erosion of the outer cortex of the mastoid process was seen in tuberculosis chronic otitis media. Recurrence of the disease was seen in 60% of tuberculosis otitis media [29], and therefore, follow-up of patients with tuberculosis otitis media is a very important aspect in the management.

According to Kriukov et al., tuberculosis otitis media was diagnosed with AFB staining of tissue in 9%, cytological in 27.3%, pathomorphological in 18%, and PCR diagnostics in 55% [30]. According to Susan's study, histopathology and AFB staining of tissue from the middle ear cleft confirmed TB in 90% [29]. According to Adhikari's study, AFB detection from diseased tissue was 5–35% and with repeated testing in 50% [31]. In the present study, AFB detection from diseased tissue was 33.33% similar to Adhikari's study.

Tuberculosis of oral cavity

Oral TB is a rare disease and is seen in 0.5 to 1% of all tubercular cases [32]. The incidence of oral tuberculosis was 0.1–5% and 0.5–1.5% in the study done by Luiz et al. [19] and Ewa et al. [33], respectively. In the present study, oral tuberculosis was seen in 2% of head and neck tuberculosis cases similar to Luiz et al.'s study.

According to Kakisi et al., men were affected more than females. In the present study, males and females were equally affected [34]. Resistance of the striated muscles to bacterial invasion and thickness of epithelial covering in the oral cavity leads to decreased incidence of oral TB. Other predisposing factors for oral TB were a breach of the oral mucosa, poor oral hygiene, local trauma, leukoplakia, and irritation by clove chewing [32].

Ewa et al [33] Pankaj et al [35] Luiz et al [19] had shown that TB of the oral cavity was secondary to their pulmonary involvement. Oral manifestations of TB occur either due to infected sputum or due to hematogenous spread [32]. According to Kakisi, oral TB was found as a secondary infection in 58% of patients and as a primary infection in 42% of patients. Oral TB was secondary to pulmonary TB in 54% of patients [34]. In the present study, associated pulmonary TB was seen in 75% of cases, which is slightly higher than in previous studies. Carcinomas were associated with 3% of patients [34]. In the present study, no patient of tuberculosis otitis media was with carcinoma.

In oral TB, all parts of the mouth such as the soft palate, hard palate, uvula, buccal mucosa, gingivae, lips, tongue, maxilla, and mandible were involved [34]. The most common site of oral tuberculosis was the tongue seen in 32.4% of cases, and the second most common site was the mandible seen in 21.4% of cases [34]. Two case reports cited the uvula as the main or initial site of presentation of the oral TB lesion [34]. Clinically oral TB presents as macroglossia, parotitis, intra-osseous lesions, preauricular swelling, trismus, tracheitis, and laryngitis [35]. The common sites of these lesions are the tongue, gingiva, floor of the mouth, and buccal mucosa [10]. Painful ulcers, nodules, fissures, and tuberculosis granulomas were seen in tuberculosis. In oral TB, ulcers were present more commonly as single with indurated, ill-defined margins, and a hard necrotic base or slough. According to Kakisi et al., nodular masses were found in 8% of patients and granulomatous enlargement of the gingivae was seen in 4% of patients. It was observed that with the use of corticosteroids infection had spread diffusely [34]. In the present study, hypertrophy of the tonsils (50% cases), ulcers in the oral cavity (50% cases), and pale granulomas over the tongue and buccal mucosa (50% cases) were seen.

Because of the paucity of AFB in the oral lesions, the sensitivity of AFB is very low. In various studies, AFB smear positivity in the oral lesion was found around 7.8% [35]. According to Kakisi, tuberculin skin testing was positive in 76% showing systemic tuberculosis and elevated ESR in all [34]. In the present study, diagnoses of oral tuberculosis were with elevated ESR in all and FNAC/Biopsy was showing tuberculosis in 50% of cases, and AFB was confirmatory in 75% of patients. AFB was confirmatory in more patients due to smears from a deeper and central necrotic area of ulcer and granulations.

Tuberculosis of the nasal cavity

According to Khan, patients' age ranged from 5 to 34 with an equal male to female ratio in nasal tuberculosis. The incidence of nasal tuberculosis was less than 1% with female preponderance [11]. In the present study, nasal tuberculosis was seen in two females (1%) of the age group 21–31 years which is comparable to previous study results. According to Stani et al., the commonest feature of nasal tuberculosis was septal perforation [5].

Septal perforation, cleft of the nasal ala, and facial abscesses may be seen in nasal tuberculosis cases [36]. Similar to the present study, the most common clinical presentation of nasal tuberculosis seen in previous studies were nasal obstruction and rhinorrhea [5, 11, 29]. The nasal mucosa is inherently resistant to tubercle bacillus but trauma and atrophic changes cause lodging of bacilli within the nasal lining and so the disease is rare [37].

Similar to Gupta et al. study, the biopsy was positive in all (100%) cases of nasal tuberculosis [38].

Conclusions

Early diagnosis of tuberculosis in ENT requires a high index of suspicion. Especially the patients not responding to routine treatment should be investigated keeping in mind tuberculosis as a differential diagnosis. Biopsy and CBNAAT have a promising role in tuberculosis management.

Limitations of study

To see recurrence and relapses, a long-term follow-up is required.

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Authors' contributions

CRP analyzed and interpreted the patient data regarding ENT manifestations of tuberculosis. ISM was a major contributor in writing. AAP had collected data and prepared master chart. WVD had helped in revising manuscript. All authors read and approved the final manuscript. APD had done audiological evaluation of tuberculosis patients.

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Availability of data and materials

All data generated or analyzed during this study are included in this published article [and its supplementary information files.

Declarations

Ethics approval and consent to participate

The Ethics Committee of Tertiary Care Centre & Government Medical College approved the study. All procedures performed in studies involving human participants were in accordance with ethical standards of the institutional ethical committee as per ICMR guidelines and University protocol by letter No. Pharma Dept. /IEC/Protocol/ENT/36/17 and with the 1964 Helsinki declaration and its later amendments or comparable Ethical standards. Informed consent was obtained from all individual participants included in the study or their parent or legal guardian in the case of children under 16.

Consent for publication

Informed written consent for publication of data was obtained from all individual participants included in the study. In the present manuscript images relating to individual participants, written informed consent for the publication was obtained from the participants or from their parent or legal guardian in the case of children under 16.

Competing interests

The authors declare that they have no competing interests.

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