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### Original article

## Oral manifestations in patients with pulmonary tuberculosis

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#### ABSTRACT

The purpose of this article is to emphasize the importance of early diagnosis of primary Tuberculosis of the mouth, which may be misdiagnosed when oral lesions are not associated with any apparent systemic infection. This helps in the understanding of disease processes but also can provide an invaluable aid in clinical diagnosis and patient management. This study should help to form a bridge between oral disease and the pulmonary Tuberculosis. The more number of the cases is an effective academic teaching tool with considerable practical value in daily practice. An appreciation of the significance of the knowledge about pulmonary tuberculosis helps to prevent needless delays in treatment and helps to eliminate the expense of unnecessary laboratory tests and consultations.

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### 1. Introduction

"The ultimate test of all dental education is to see how well it prepares the practitioner to serve the patients". [1] Tuberculosis is a chronic granulomatous disease and often deadly infectious disease caused by various strains of mycobacteria, usually *Mycobacterium tuberculosis* in humans. On March 24th 1882 Robert Koch discovered the tubercle bacillus, since the 1940's and 1950's Antituberculosis treatment has been available, making tuberculosis 100% curable. And yet in 1993 the world health organisation (WHO) declared tuberculosis a global emergency. Tuberculosis usually attacks the lungs but can also affect other parts of the body. It spreads through the air, when people who have the disease cough, sneeze, or spit. Most infections in humans result in an asymptomatic, latent infection, and about one in ten latent infections eventually progresses to active disease.[2]

Tuberculosis remains a major health problem in most developing countries, extremely high prevalence in Asian countries. India accounts for nearly one-third of the global burden of tuberculosis. The World Health Report of the Director General WHO (1998) on Life in the 21st century says, TB remains a worldwide public health problem despite the fact that the causative organism was discovered more than 100 years ago and highly effective drugs and vaccine are available making tuberculosis a

preventable and curable disease. According to conservative estimates, there are 15 – 20 million cases of infectious tuberculosis in the world. This "infectious pool is maintained by the occurrence of 7.25 million new cases.[2]

The oral manifestations of the lesions due to tuberculosis produce a variety of forms and can occur anywhere in the oral cavity. However, they show a predilection for certain areas of the mouth. It is hypothesized, that the oral manifestations of lesions can produce a distinct pattern of oral findings in tuberculosis group of patients.[3] It is important to record the oral findings of lesions in tuberculosis patients and study the pattern of oral lesions. Around eight million people become ill with Tuberculosis every year. Nearly one percent (1%) of the world's population is newly infected with Tuberculosis each year.[4] The case rate varies from one region to another and is dependent on factors such as poor living conditions, low socio economic status, low native resistance and compromised immunity from debilitating or immunosuppressed. The HIV pandemic provides further evidence of the interplay between TB infection and immunity. Exposure of tuberculosis carries a 10% annual risk of disease in HIV positive individuals, compared to a 5% lifetime risk in the absence of HIV.[5]

Also the emergence of multiple-drug resistance forms of Tuberculosis has raised concerns among health officials in many cities. Tuberculosis lesions of the mouth by primary inoculation are unusual, most cases occur as a result of Tuberculosis of other parts of the body, generally the lungs.[6]

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The aim and the objective of this study was to evaluate the incidence of oral manifestations in patients with pulmonary tuberculosis and to evaluate ulcers in oral cavity and osteomyelitis of jaws in patients with pulmonary tuberculosis- Descriptive Cross-sectional Study.

## 2. Materials and Methods

The study population included 300 of any age group patients reporting to Ragas Dental College & Hospital, Chennai, Voluntary Health Services, Adyar, Chennai, Institute of Thoracic Medicine, Chetpet, Chennai, who were diagnosed with Pulmonary Tuberculosis. Permission from the ethical committee was obtained before starting the study for interrogating and examining the patients. All patients participating in the study had to give written informed consent. The patients were diagnosed as having Pulmonary tuberculosis by sputum testing( Ziehl Neelsen technique for staining and chest x-ray in the Institute of thoracic medicine Chetpet Chennai, Ragas Dental College and Hospital, Voluntary Health Service. These patient underwent general clinical examination to exclude HIV, any systemic disease, lesions not related to any other oral habits and patients on immunosuppressive therapy. Patients were examined for the presence of intra oral manifestations of tuberculosis like tuberculous ulcers, and osteomyelitis.

The clinical criteria for diagnosis of oral lesions such as tuberculous ulcers consisting of a stellate ulcer, undermined edges, a granulating floor, ragged and not indurated and is often painful. Although the tongue is the commonest site for oral tuberculous lesions, they may also occur on the gingiva, floor of mouth, palate, lips and buccal mucosa.

Oral carcinoma included a non-healing ulcero-proliferative growth with pain, tenderness, limitation or loss of function, bleeding, red, white or mixed red and white areas. It can be flat or elevated. It may covered by necrotic slough. On palpation it may be smooth, granular, rough or crusted with induration of the base and margins. Presence of cervical lymphadenopathy. The lymphnodes are enlarged firm to hard on palpation usually non-tender unless secondarily infected and is fixed to the underlying structures.

Periosteal tuberculosis, a piece of bone becomes dead (sequestrum) and remains within the cavity which is formed by destruction of the bone due to the infection commonly affecting long bones. This cavity is generally connected outside through a sinus. The cavity contains serous fluid and pus, which may be discharged through the sinus. The mouth of the sinus shows sprouting granulation tissue, which indicates presence of the sequestrum in depth. On palpation, the bone becomes thick and irregular. X-ray shows areas of bony rarefaction surrounded by dense sclerosis and sometimes sequestrum within the cavity of the bone.

Biopsy specimens were collected and stored in 10% formalin solution and sent for histopathological evaluation. The data were collected and statistical analysed using Chi Square Test (SPSS software SYSTAT version 7.0).

## 3. Result and Discussion:

Among the 300 study population 203 (67.7%) of them were males and 97 (32.3%) were females, 27(9%) patients were between 5-20 Years, 82 (27.3%) patients were between 21-35 Years, 103 (34.3%) patients were between 36-50 years, 60 (20%) patients were between 51-65 years, 28 (9.3%) of them were above 65 years with the mean age group of 42 years. This is in accordance to the study conducted by Sonis [7] et al in 1973 with the age group of 10-60 Year. In our study affected patients were in all age groups, the majority of patients were middle-aged and older persons. This is in accordance to the study conducted by Gregory and Gupta K.B [8] in 1980. With respect to Sex, the male patients were affected more and male to female ratio was 2:1. Out of 300 patients, 203 (67.7%) of them were males and 97 (32.3%) were females. The males were affected more because of greater possibility of local trauma and irritation in work, chewing, and smoking. This is in accordance with the study conducted by Rubin [9] 1927 (2:1) but it is not accordance with the study conducted by Handfield Jones [10] 1937 (3:2), Komet et al [11] in 1965 (4:1) and Gregory and Gupta K. B [8] 1980 (5: 1). With respect to History of Diabetes the percentage of Tuberculosis patients with Diabetes is 26 (8.7%) (Table 1). and 274(91.3%) of them were Non Diabetic This is in accordance with the study conducted by Tullock, Bahulkar and Lokhandwala [18] in 1974 (7.8%). The Male (18) to Female (8) ratio in our study was 2:1 which is in accordance with the study conducted by Patel. [13] in 2008 (2.15: 1). With respect to presence of Oral carcinoma one(0.3%) case had been reported (Table 2). This is not in accordance with the study conducted by Kakisi OK [14], in 2010(3%). Out of 300 patients, 153 (53%) of the patients were sputum positive and 141 (47%) patients were sputum negative, according to examination of sputum (Table 3). This is in accordance with the study conducted by Claude Mambo [15] et al in 2010 (30-57%). The common age group with sputum positive were within the age 36-50 Years and this is not in accordance with the study conducted by Leonard [16], in 2010 (15-44 yrs). With respect to presence of Oral Ulcers 3(1%) of the patients had oral ulcer and 297 (99%) of the patient had no oral ulcers (Table 4). This is in accordance with the clinical oral involvement, particularly as a secondary manifestation of the disease by Rubin [19] 1927 (1.44%), The result is not in accordance with the study conducted by Sonis et al [9] (0.14%) in 1973. With respect to presence of Oral Ulcers it is more common in males 3(100%).

This is accordance with the study conducted by Handfield-Janes and Melvin [19] in 1937 (6:1). Tuberculosis of tongue is more common in men than in women This is accordance with the study conducted by Komet et al [11] in 1965. It is generally accepted that Oral Ulcers are usually secondary to tubercular involvement of the other organs principally the lungs. Tubercular infection of the tongue usually occurs due to direct contact with the infected sputum but the other routes of infections mentioned are lymphatic spread, hematogenous spread and extension from the involved neighbouring tissues. In our study all the oral ulcers were secondary to lung involvement. This is accordance with the study conducted by Komet et al [11] in 1965. With respect to type of Oral Ulcers all the 3(1%) ulcers were ulcerative type. This is accordance with the study conducted by Rubin [19] in 1927.

Analysis of the study population recruited for the study reveal statistically significant difference with respect to variable such as Age, Sex, History of Diabetes, Presence of Oral Ulcers, Oral Carcinoma and Sputum Positive patients.

**Table 1 - Distribution of Subjects with the presence of History of Diabetes Mellitus**

DIABETES	FREQUENCY	PERCENTAGE
Present	26	8.7%
Absent	274	91.3%
Total	300	100%

Pvalue = 0.001

**Table 2 - Distribution of Subjects with the presence of Oral Carcinoma**

ORAL CARCINOMA	FREQUENCY	PERCENTAGE
Present	1	0.30%
Absent	299	99.70%
Total	300	100.00%

Pvalue = 0.001

**Table 3 - Distribution of Subjects based on Sputum results**

SPUTUM	FREQUENCY	PERCENTAGE
Present	159	53.0%
Absent	141	47.0%
Total	300	100.0%

Pvalue = 0.299

**Table 4 - Distribution of Subjects with the presence of Oral Ulcer**

ORAL CARCINOMA	FREQUENCY	PERCENTAGE
Present	1	0.30%
Absent	299	99.70%
Total	300	100.00%

PValue: 0.001

#### 4. Conclusion

In conclusion of this study it was pointed out that not all pulmonary Tuberculosis patients have oral manifestation. The oral incidence is less. The recent increase in the incidence of tuberculosis, combined with an emerging global resistance to anti tuberculous drugs, warrants an increased awareness of the involvement of Mycobacterium tuberculosis in persistent or atypical lesions in the oral cavity.

So, any suspicious oral ulcer should be examined properly with the help of other clinical findings and proper laboratory investigation to find the disease at the earliest phase, which will reduce the morbidity and mortality of the patients.

It is the responsibility of the dental professionals to be aware of the oral manifestations of Tuberculosis and the early diagnosis helps to prevent needless delay in the treatment and also eliminates the expense of unnecessary laboratory tests and consultation.

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