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Dental Science

MANAGEMENT OF TUBERCULOSIS PATIENT IN A DENTAL SETTING IN INDIA- A REVIEW

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ABSTRACT Tuberculosis (TB) still continues to be endemic in various regions of the world, including in India and needs surveillance, clinical assessment, testing, contact tracing, confirmation of diagnosis with supervised or in-supervised treatment regimens for an effective eradication. Tuberculosis is responsible for the death of every third AIDS patient in India and accounts for about a quarter of the global tuberculosis burden. The ministry reiterated their commitment to eliminating tuberculosis in the country by 2025. This article gives dentists an overview of the guidelines' recommendations that are applicable to most outpatient dental settings.

KEYWORDS : Dental setting, NTEP, tuberculosis, management, India

Introduction

Tuberculosis (TB) is an infectious disease caused by Mycobacterium tuberculosis. Tuberculosis commonly affects the lungs, but can also affect other parts of the body. It spreads from person to person through the air, when people who are infected with TB infection cough, sneeze or otherwise transmit respiratory fluids through the air. Tuberculosis is one of India's major public health problems. According to World Health Organization (WHO) estimates, India has the world's largest tuberculosis epidemic.[1] In 2020, India accounted for 26% of the incident TB cases across the globe. India has incidence rate of 192 cases per 100,000 of population.

According to WHO, an estimated 9.9 million people fell ill with TB and 1.5 million people died globally in 2020, despite being a preventable and curable disease.[2]

India notified more than 2.6 million TB cases in 2021[3], it continues to have the largest share of the global TB burden. India's National TB Elimination Programme (earlier known as Revised National TB Control Programme) is strengthened to meet the goal of ending the TB epidemic by 2025 from the country, five years ahead of the Sustainable Development Goals (SDG) for 2030. The National Strategic Plan for Tuberculosis Elimination 2017-2025 was developed to achieve the goal.[4]

In India, tuberculosis is responsible for the death of every third AIDS patient. Moreover, India accounts for about a quarter of the global tuberculosis burden. The ministry reiterated their commitment to eliminating tuberculosis in the country by 2025. As part of its efforts to eliminate tuberculosis, the Union Government changed the name of Revised National Tuberculosis Control Program (RNTCP) to National Tuberculosis Elimination Program (NTEP) on December 30, 2019.[5]

Tuberculosis is a major issue for oral healthcare due to its mode of transmission, the development of drug resistant strains and newly emerging risk factors for the disease.

TB is a notifiable disease in India, meaning that medical practitioners and laboratories have a statutory requirement to inform the local health protection team within three days of a suspected or confirmed case.[5] This paper discusses the potential implications for both patient care and management of the dental team.

Table 1- High risk groups for TB infection[6,7]

Social	Medical
Low socio-economic status	HIV/AIDS
Minority ethnic groups	Diabetes
Recent migration from country with high incidence of TB	Malnutrition
Contact with people with established TB infection	Immunosuppression: Solid organ transplant Chemotherapy Treatment with biologic agents
Alcohol and drug misuse	Haematological malignancy
Smoking	Jejunoileal bypass
No fixed abode	Gastrectomy
Poor access to healthcare	Chronic kidney disease or haemodialysis

Table 2- Summary of clinical and diagnostic features of latent and active pulmonary TB6,8,9

Feature	BCG Vaccinated	Latent TB	Active TB	
Symptoms	None	None	Asymptomatic (25%)	Symptomatic (75%) Persistent cough >3 weeks Haemoptysis Pain on breathing Malaise Weight loss Night sweats
Risk of Infection	None	None	Yes- droplets in aerosol	

Diagnosis

Symptomatic Diagnosis: Coughing for more than 2 weeks, loss of weight, loss of appetite, fever and night sweats, fatigue are common symptoms of tuberculosis. If someone has these symptoms, one should seek medical advice to check whether it is tuberculosis.

Blood tests

Sputum examination- Samples of mucous and phlegm are checked for the presence of bacteria.

Chest X-ray: This uses radiation to create an image of lungs. In TB infection, there are changes in the structure of lungs, which of lungs, are visible on the X-ray.

- **Drug susceptibility testing:** It provides a definitive diagnosis of drug- resistant TB.

- **CBNAAT (Cartridges Based Nucleic Acid Amplification Test):** CBNAAT is used for early diagnosis of MDR-TB and TB in high risk population such as presumptive TB cases in PLHIV (people living with HIV), EP-TB (extra-pulmonary TB) and pediatric populations. The CB NAAT machines have been placed at most of the districts in the country at headquarter or Medical College, ART Center or major Pediatric hospitals.

For TB of extra pulmonary sites. Diagnosis includes:

- Computerized tomography (CT) scan: A series of X-rays of body is taken at slightly different angles and a computer puts the images together to create a detailed picture of the inside of body.

- Magnetic resonance imaging (MRI) scan: A magnetic field and radio waves are used to produce detailed images of the inside of body.

- Ultrasound scan: High-frequency sound waves create an image of part of the inside of the body.

- Urine tests

- Biopsy: A small tissue sample is taken from the affected site and tested for the presence of disease.

Implications for patient care and the dental team

The dental team has an obligation to provide the same high standard of care for patients with infectious diseases as available to any other patient.[5] A number of considerations must be made in relation to TB. This includes infection control policy, staffing, vaccination, medical history, personal protection, decontamination and treatment modality. Patients who report that they have been diagnosed with TB have to be questioned regarding status of the disease. It is vital to make a distinction between asymptomatic infection, remote inactive disease, and active disease on therapy. Asymptomatic individuals with a positive tuberculin skin test and no evidence of active pulmonary disease do not present a risk for transmission of TB but may be candidates for preventive therapy.[10] Patients with a positive skin test and evidence of prior active TB by chest radiograph are also not infectious but, if not treated in the past, may also be candidates for prophylactic therapy. Patients with active disease should be on appropriate chemotherapy. Patients should be questioned about the type of medication they are taking, the duration of the treatment, and the compliance with drug therapy. Anti-TB therapy rapidly reduces the infectivity of the individual, and 2 weeks is usually considered adequate to label a patient as non-infectious.[11]

Only persons with active disease are infectious to others. (Table- 3) The medical history should include the signs and symptoms of pulmonary TB, which include cough, production of sputum and blood (hemoptysis) and chest pain. Other nonspecific symptoms, such as anorexia, fatigue, weight loss, fever and night sweats, are often associated with active TB.

Table-3 Tuberculosis: dental considerations (adapted from Phelan et al[12])

Before treatment	Establish previous history of TB exposure medical treatment and follow-up, and any prophylactic therapy May need physician consult if poor history or unclear treatment Patient with history of positive tuberculin test and without signs/symptoms of active tuberculosis
During treatment	Patients with active TB • Dental emergencies only • Controlled environment (protective gear/respirator, pressurized air flow)
During treatment	Patients with signs and symptoms suggestive of TB • Dental emergencies only • Consider referral for medical evaluation and workup to rule out TB • Protective gear (respirator mask) Patients with a history of TB • Routine dental treatment (after establishing that the patient has been adequately treated and followed and there are no signs and symptoms of active disease) Patients with a positive tuberculin test with no history of TB and no signs or symptoms of active disease • Routine dental treatment • Consult with physician if there is any question of the presence of active disease
After treatment	No specific precautions

Adverse reactions to TB medications may occur. The clinician should avoid medication interactions such as acetaminophen and isoniazid because of the potential for hepatotoxicity.[13]

Personal Protection

Basic Coughing Etiquette

As healthcare professionals, we have a duty to inform staff and patients of basic cough etiquette in order to reduce the risk of transmission. This includes covering the mouth and nose with a barrier when coughing or sneezing, such as with a tissue and disposal in a waste receptacle. If this is not possible, the mouth and nose should be covered with a bend of the elbow or hands, which should be cleaned immediately with soap and water or alcohol-based solution.

Protection from aerosol

Maintaining hand hygiene, wearing gloves and clothing with access to the forearms, in addition to the use of disposable aprons, eye protection and face masks are important aspect of personal protection.

Masks

A standard surgical mask,[14] worn to protect the patient and clinician from cross infection due to large particles in splashes. They do not provide full respiratory protection against smaller suspended droplets and aerosols as is required in the prevention of transmission of active TB.[15] When aerosol generating procedures are carried out in people with active TB, healthcare workers are advised to wear a mask which provides a higher level of filtering ability over a longer period of time.[15,16] Filtering face pieces (FFP) FFP1 –FFP3 are available and the Health and Safety executive (HSE) advises that these masks are fit tested. NICE guidance[17] offers limited information in respect of protective equipment for healthcare workers; however it is stated that staff should wear FFP3 masks during contact with a person with suspected or known multidrug-resistant TB while the person is thought to be infectious. This mask provides the highest level of filtering capability and can be fitted with or without an exhalation valve for comfort.

Irrespective of type, masks are single use items and should be changed after each patient.[4] In order to ensure quality of manufacture, masks and filtering face pieces must meet HSE standards, and the appropriate European Standards of EN14683:2005 and EN149:2001 respectively.[16]

Treatment modality

Emergency treatment when required in cases of active TB, realistic options for dental care may be limited to treatment under local anaesthesia. Treatment under conscious sedation or general anaesthesia would be complex for the patient with active pulmonary TB since they may be acutely unwell, malnourished and often anaemic with bronchiectasis and compromised lung function.[18]

It is recommended that cases with a high risk of cross infection are scheduled last on the operating list to minimise risk. Where this is not possible, the Hospital Infection Society advises that a plenum-ventilated operating theatre should require a minimum of 15 minutes before proceeding to the next operation. In the unlikely event that

treatment under conscious sedation is planned, further discussion with local infection control and anaesthetic teams is warranted with consideration given to risk of respiratory depression, the need for increased oxygenation and avoidance of drug interactions with concurrent TB treatment.[19]

Conclusion

Employers must be aware of their legal obligations in the recruitment and care of staff with a history of TB, in addition to their responsibility towards the protection of both staff and patients through adherence to occupational health policy. A local infection control policy should be available to the dental team. Patients with latent TB do not require additional clinical precautions to be taken in the delivery of their care. Patients with active TB often have additional medical complications. When emergency dental care is required in active infection, referral to secondary care is appropriate.

For dental settings in India, effective implementation of these recommendations will require the coordinated efforts of public health departments; local, state and national dental organizations; state dental directors; federal agencies; academic institutions; and individual dental practitioners. In addition, the process of implementing these recommendations must safeguard, in accordance with applicable state and federal laws, the confidentiality and civil rights of persons who have active TB.

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