



## Diabetes Mellitus and Tuberculosis

**For Prelims:** [Diabetes Mellitus](#) and [Tuberculosis](#), [Epidemics](#), **Type 2 Diabetes, Tuberculosis, Respiratory Infections.**

**For Mains:** Diabetes Mellitus and Tuberculosis.

[Source: TH](#)

### Why in News?

For a very long time, India has been experiencing the burden of two severe [Epidemics, Diabetes Mellitus \(DM\)](#) and [Tuberculosis \(TB\)](#), however few know how deeply these **diseases are interlinked.**

- Currently, India has around **74.2 million people living with diabetes** while **TB affects 2.6 million Indians every year.**

### How Are DM and TB Interlinked?

- **Risk of Developing Respiratory Infections:**
  - The DM increases the **risk of developing respiratory infections.** DM is a major risk factor that increases the incidence and severity of TB.
  - **Among people with TB, the prevalence of DM was found to be 25.3%** while 24.5% were pre-diabetic, in a 2012 study in tuberculosis units in Chennai.
- **DM Hampers the Recovery of TB:**
  - DM not only increases the risk of TB but also hampers the recovery process and **prolongs the time for TB bacteria to be eliminated** from the body.
  - The impaired cell-mediated immunity in **DM affects the body's ability to fight infections,** including TB.
- **Alters the Defense Mechanism:**
  - Uncontrolled DM alters the **defense mechanisms in the lungs,** making individuals more susceptible to TB infection.
  - Additionally, the altered functions of small blood vessels in the lungs and poor nutritional status, common in DM, create an environment that facilitates the **invasion and establishment of TB bacteria.**
- **Likelihood of Unfavorable TB Treatment Outcomes:**
  - DM increases the likelihood of unfavorable TB treatment outcomes, such as **treatment failure, relapse/reinfection, and even death.**
  - The coexistence of TB and DM in patients may also **modify TB symptoms, radiological findings, treatment, final outcomes,** and prognosis.
  - The dual burden of DM and TB not only impacts the health and survival of individuals but also **places a significant burden on the healthcare system,** families, and communities.

### What can be done to Tackle Both DM and TB?

- Provide **individualized care for TB and DM patients**, integrating treatments and addressing comorbidities.
- Improve patient education, support, and nutrition **to enhance TB treatment outcomes**.
- Strengthen healthcare programs for TB and DM, **build resilient and integrated health systems**, and use research to inform evidence-based decision-making.

## What is Diabetes Mellitus (DM)?

### ▪ About:

- DM is a disorder in which the **body does not produce enough or respond normally to insulin**, causing blood sugar (glucose) levels to be abnormally high.
- The name Diabetes Mellitus is often used rather than diabetes alone, to distinguish this disorder from **Diabetes Insipidus**.
  - Diabetes insipidus is a relatively rare disorder that does not affect blood glucose levels but, just like diabetes mellitus, **causes increased urination**.
- While **70-110 mg/dL fasting blood glucose is considered normal**, blood glucose levels between **100 and 125 mg/dL is considered prediabetes**, and **126 mg/dL or higher is defined as diabetes**.

### ▪ Types:

#### ◦ Type 1 Diabetes:

- The body's immune system **attacks the insulin-producing cells** of the pancreas, and more than 90% of them are **permanently destroyed**.
- The pancreas, therefore, produces little or no insulin.
- Only about 5 to 10% of all people with diabetes have type 1 disease. Most people who have type 1 diabetes develop the **disease before age 30**, although it can develop later in life.

#### ◦ Type 2 Diabetes:

- The pancreas often continues to produce insulin, sometimes even at higher-than-normal levels, especially early in the disease.
- However, the body develops **resistance to the effects of insulin**, so there is not enough insulin **to meet the body's needs**. As type 2 diabetes progresses, the **insulin-producing ability of the pancreas decreases**.
  - Type 2 diabetes was once rare in children and adolescents but has become more common. However, it usually begins in people older than 30 and becomes progressively more common with age.
  - About 26% of people older than 65 have type 2 diabetes.

## What is Tuberculosis (TB)?

- Tuberculosis is an infectious disease that can **cause infection in your lungs or other tissues**.
- It commonly affects lungs, but it can also affect other organs like your **spine, brain or kidneys**.
- TB is caused by **a bacterium called Mycobacterium tuberculosis**. The bacteria usually attack the lungs, but TB bacteria can attack any part of the body such as the kidney, spine, and brain.
- The **three stages of TB are**:
  - Primary infection.
  - Latent TB infection.
  - Active TB disease.