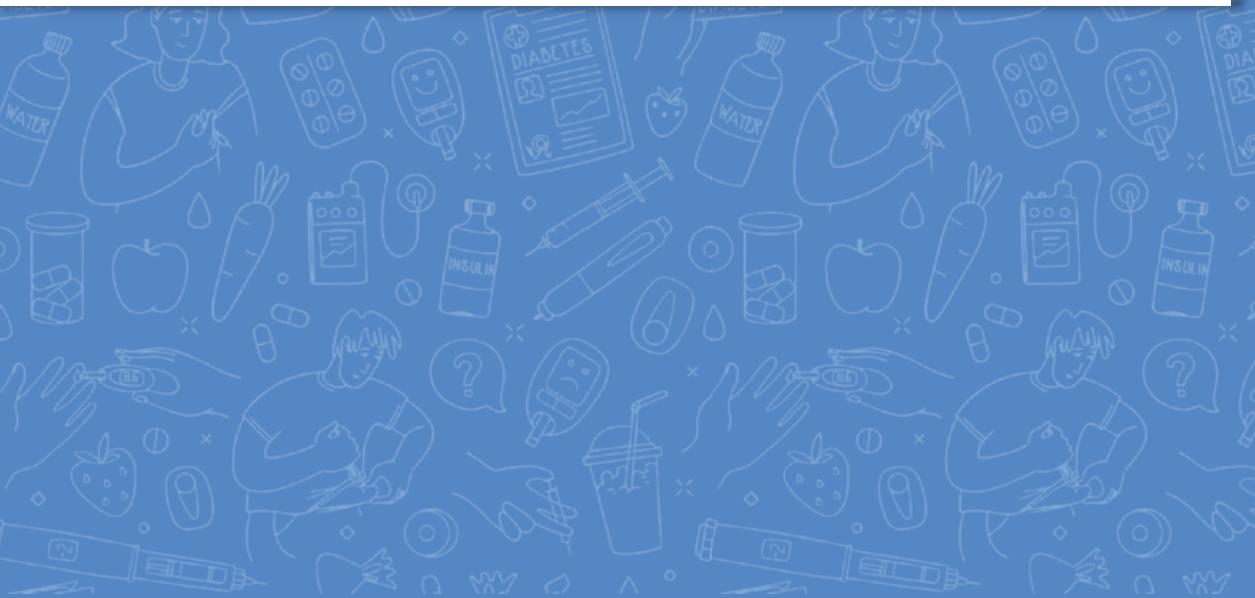




TYPE 5 DIABETES: CHRONIC UNDERNUTRITION



UNDERSTANDING TYPE 5 DIABETES MELLITUS (T5DM)



The concept of T5DM refers to **severe insulin-deficient diabetes (SIDD)**, characterized by **elevated levels of insulin deficiency and poor metabolic control**

T5DM, also known as **malnutrition-related diabetes mellitus**, is **primarily caused by chronic undernutrition**, especially during childhood or adolescence

Believed to stem from **impaired pancreatic development due to long-term nutrient deficiencies**

TYPE 5 DIABETES: A GLOBAL HEALTH EQUITY CHALLENGE



2025

Recognition Year

Official classification by the International Diabetes Federation (IDF)



20 to 25 Million

Global Burden

Estimated people affected worldwide by Type 5 diabetes mellitus



2

Primary Regions

Parts of South and Southeast Asia and Sub-Saharan Africa

DISTINCTIVE CLINICAL FEATURES OF TYPE 5 DIABETES MELLITUS

No autoimmune or genetic cause



Low body fat percentage compared to T2DM patients



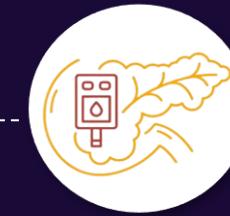
Severely inadequate protein, fiber, and micronutrient intake



Very low BMI ($<18.5 \text{ kg/m}^2$), lower than in typical T2DM



Extremely low insulin levels ($< \text{T2DM}$, slightly $> \text{T1DM}$)



Comprehensive Diagnostic Approach for Type 5 Diabetes Mellitus

Integrating clinical, immunogenetic, laboratory, and nutritional assessments for accurate T5DM identification



Immunogenetic Analysis: Absence of autoimmune markers (e.g., GAD antibodies) rules out type 1 diabetes



Blood Tests: Elevated fasting blood glucose (>126 mg/dL) or HbA1c ($>6.5\%$) without ketosis

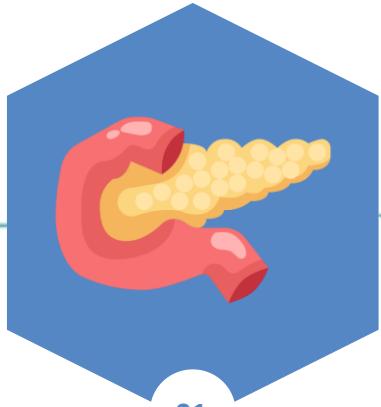


Nutritional Assessment: Low BMI, protein deficiency, or micronutrient imbalances support a type 5 diagnosis

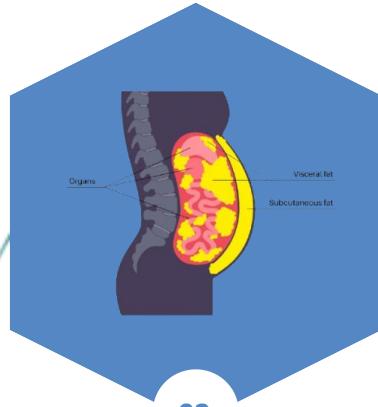


Clinical History: History of malnutrition or residence in high-risk regions

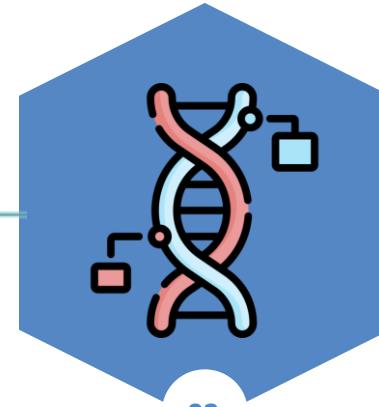
MECHANISMS OF TYPE 5 DIABETES MELLITUS



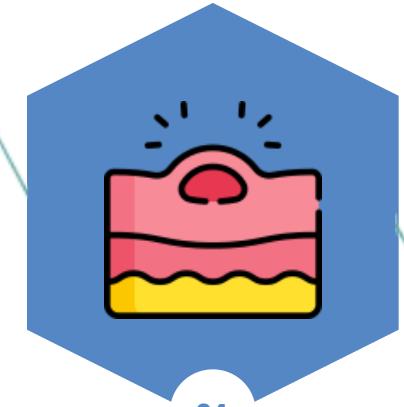
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02



03



04

Impaired B-Cell Function

Malnutrition hampers beta cell development and insulin production, predisposing individuals to glucose intolerance and diabetes later in life, especially during catch-up growth

Insulin Resistance

Chronic undernutrition reduces skeletal muscle mass, the major site for glucose uptake, leading to reduced insulin sensitivity

Epigenetic Changes

Malnutrition causes changes (e.g., DNA methylation) that permanently alter genes related to insulin signaling and glucose metabolism, increasing lifelong risk

Inflammatory Pathways

A persistent low-grade inflammatory state is induced, contributing to Beta-Cell Dysfunction and insulin resistance