Euglycemic Ketoacidosis in the Non-Diabetic Patient

A Rare Adverse Effect of SGLT2 Inhibitor Therapy

PATIENT BACKGROUND & HISTORY

Non-Diabetic Profile

Patient had no history of diabetes, confirmed by a normal HbA1c of 5.3%.

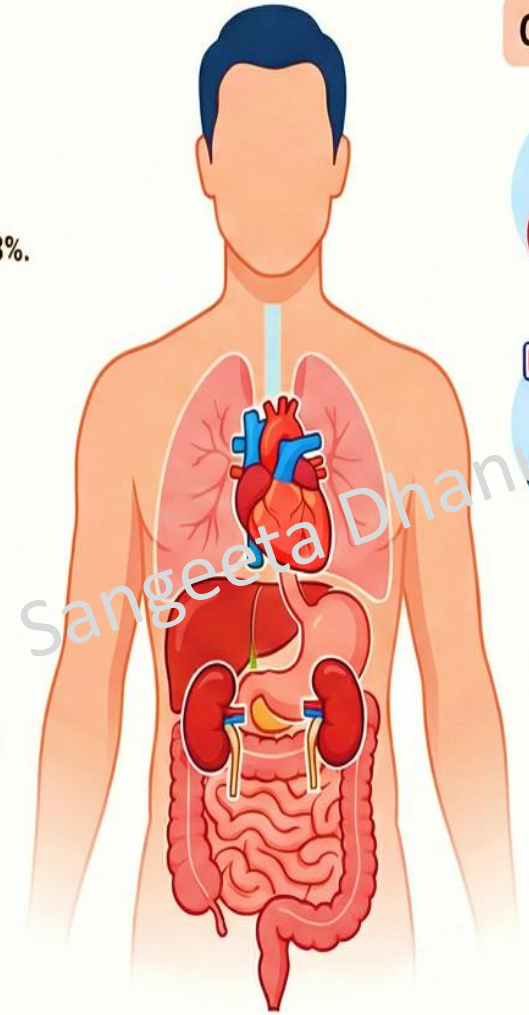
Underlying Comorbidities

History includes Ischemic Cardiomyopathy and Chronic Kidney Disease.

Recent Medication Change

Dapagliflozin (10 mg/day) was initiated three weeks prior for heart failure management.

Current Meds:
Aspirin, Enalapril, Carvedilol



CLINICAL PRESENTATION & SYMPTOMS

Severe Gastrointestinal Distress

Two-day history of persistent nausea, repeated vomiting, and diffuse dull abdominal pain.

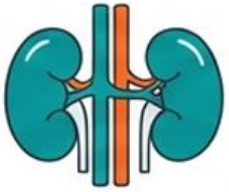
Constitutional Symptoms

Presentation included generalized weakness, profound fatigue, and total loss of appetite.

- No Fever
- No Chest Pain (Not Heart Failure)
- No Alcohol Use
- No Fasting or Infection

Investigation Results

Ischemic Cardiomyopathy
LVEF 35%



CKD Stage 2
eGFR 61 mL/min/1.73 m²

HbA1c: 5.3%

Glucose

108 mg/dL

Normal/Misleading

Arterial pH

7.21

Severe Acidosis

Beta-Hydroxybutyrate

5.4 mmol/L

Massive Ketosis (Ref <0.5)

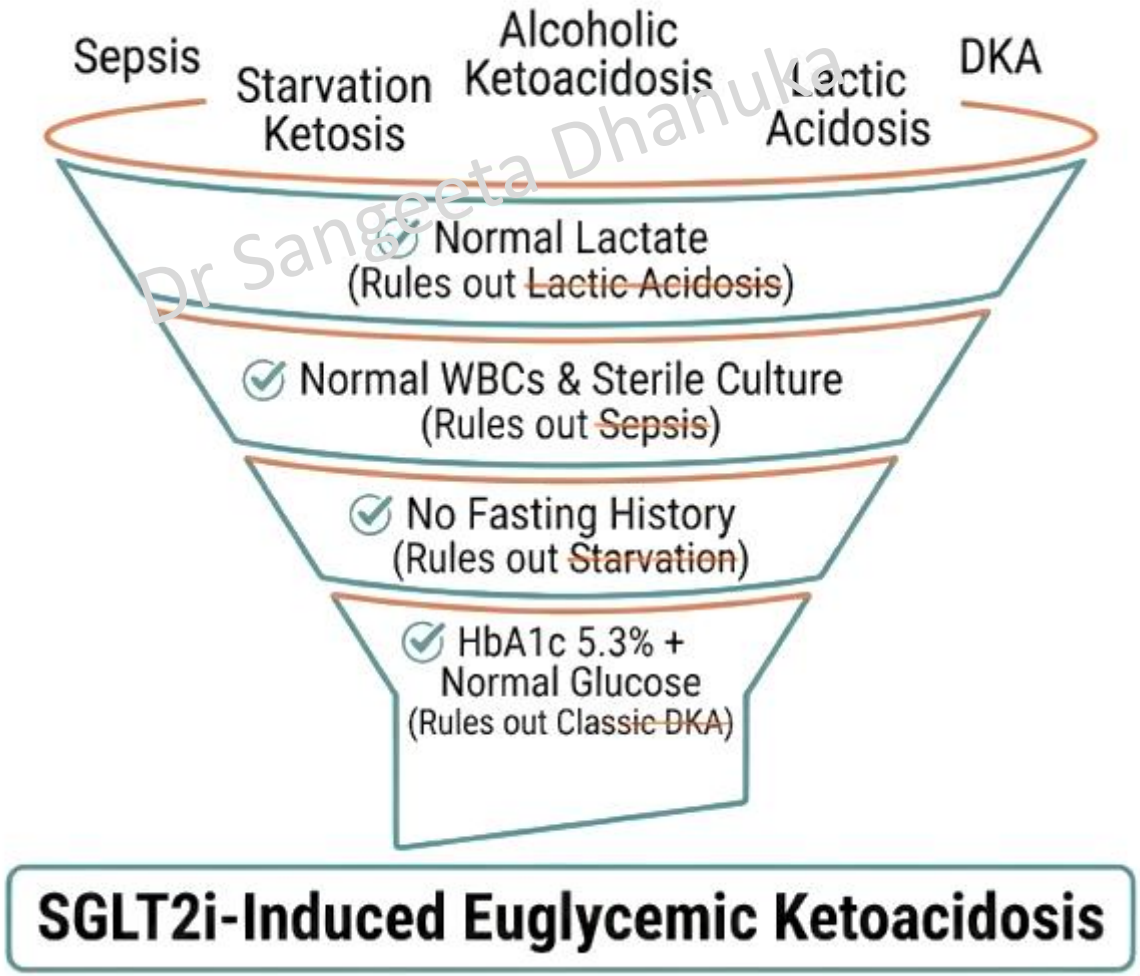
Anion Gap

23 mmol/L

High Gap

Urinalysis: Glucosuria (++) and Ketonuria (+++).

Differential Diagnosis: Process of Elimination



Management

1. Discontinue Agent

Immediate stop of Dapagliflozin.

2. Clear the Acid

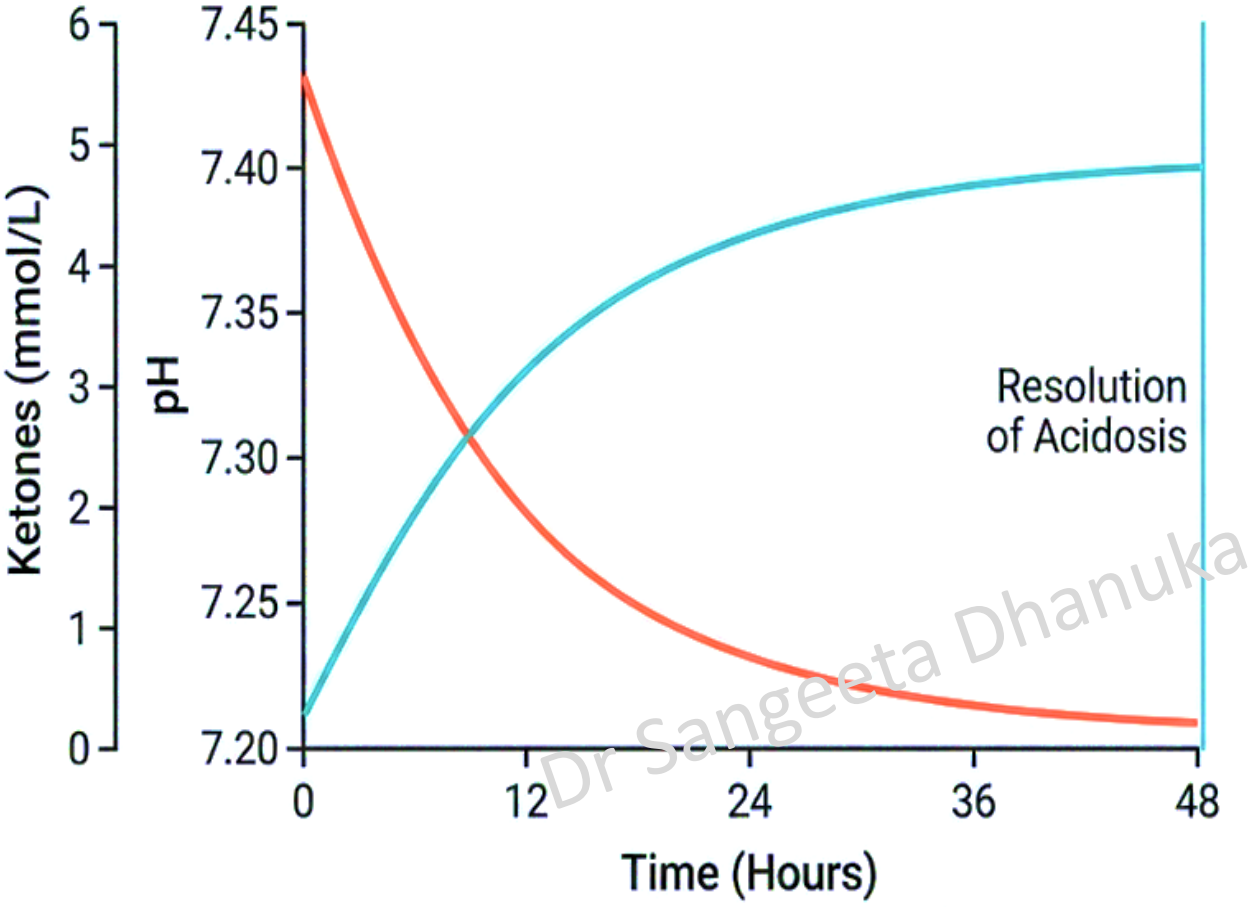
IV Saline for rehydration and renal clearance of ketones.

3. The Metabolic Fix

- Insulin Infusion (0.05 units/kg/hr) to stop ketone production.
- **PLUS**

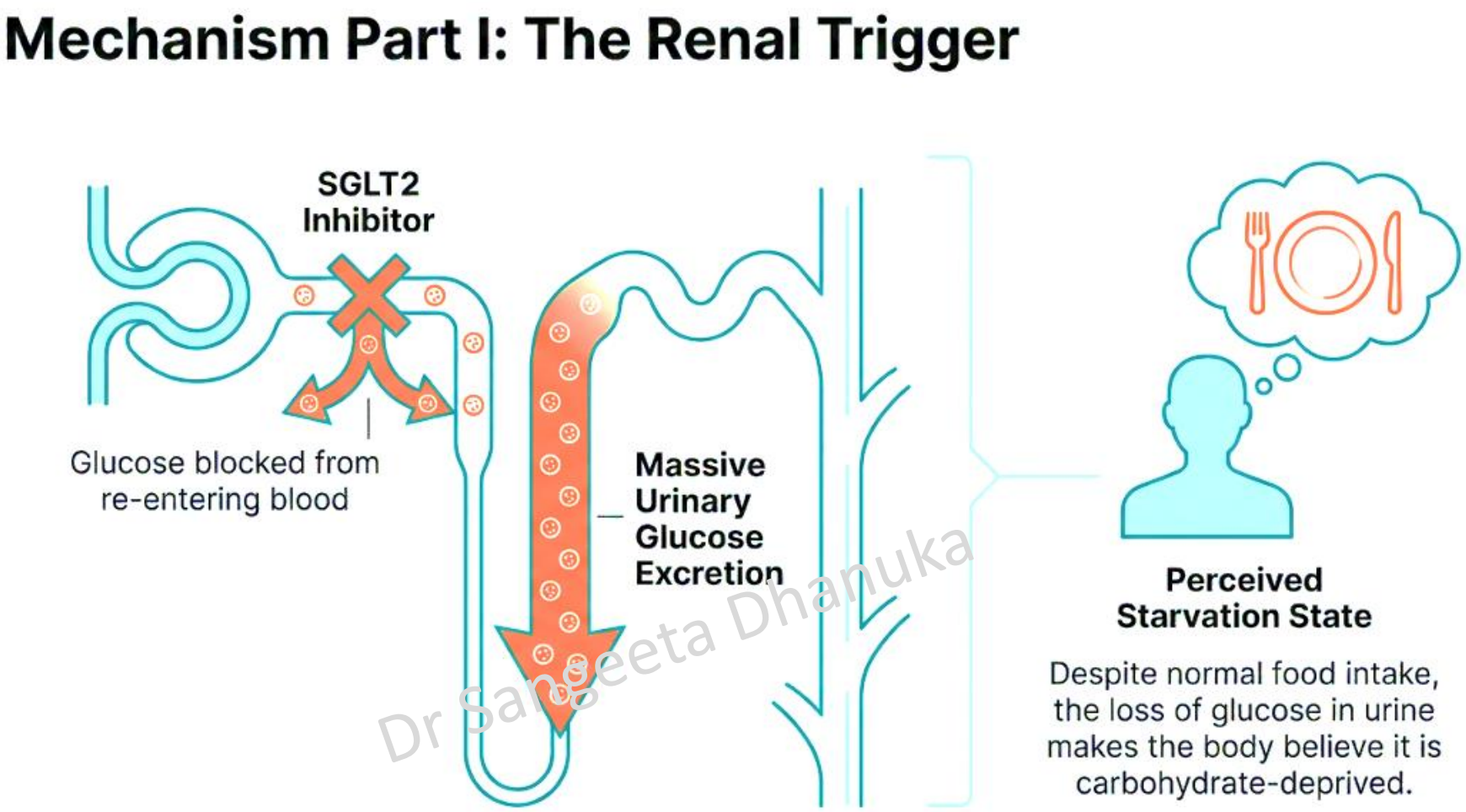
10% Dextrose Infusion to to prevent hypoglycemia.

Clinical Course & Outcome



- **Day 3:** Tolerating oral diet.
- **Day 4:** Discharged.
- **3 Months:** No recurrence. Meds switched to Sacubitril-valsartan.

Why and how did it happen?



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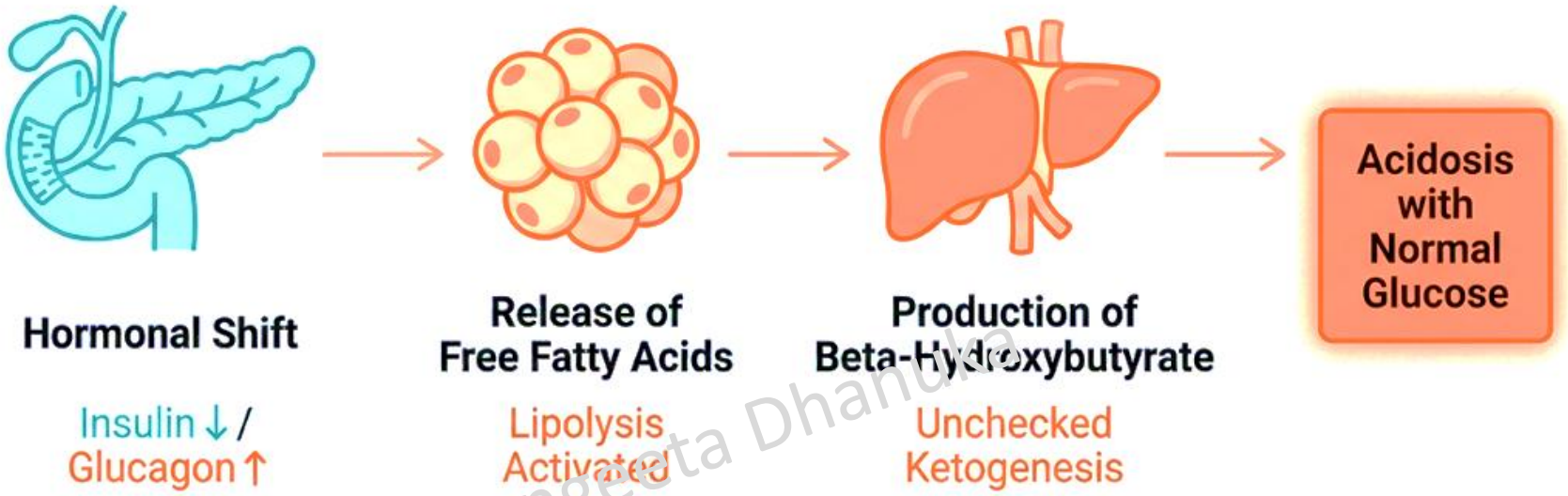
Mechanism Part II: The Metabolic Storm



In non-diabetics, residual insulin keeps blood sugar normal, but is not enough to stop the liver from producing ketones

Key Learnings for Clinical Practice

1. **High Index of Suspicion:** Suspect Ketoacidosis in SGLT2i patients with nausea/vomiting, even if glucose is normal.
2. **The Right Test:** Do not rely on glucometers. Check Blood Ketones or ABG.
3. **No Trigger Needed:** Can occur without fasting or surgery in non-non-diabetics.
4. **Patient Education:** Teach 'Sick Day Rules'—stop medication during during acute illness.