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Early Diabetes Remission Following Tirzepatide-Based Combination Therapy in a Young Indian Adult with Recent-Onset Type 2 Diabetes: A Case Report

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Abstract: ***Tirzepatide has demonstrated potent glucose-lowering and weight-reduction effects; however, real-world remission data remain limited. We report a 28-year-old male with recent-onset type 2 diabetes mellitus and obesity who was treated with tirzepatide-based multimodal therapy. Baseline evaluation revealed a body weight of 90 kg, body mass index of 30.8 kg/m², HbA1c of 6.69%, fasting plasma glucose of 164 mg/dL, and triglycerides of 328.2 mg/dL. Treatment included once-weekly tirzepatide (2.5 mg, titrated to 5 mg), metformin 1000 mg/day, dapagliflozin 10 mg/day, and structured lifestyle modification consisting of a calorie-restricted diet and regular physical exercise. At one month, body weight decreased by 6 kg. At three months, total weight reduction reached 11 kg, HbA1c improved to 5.02%, fasting plasma glucose normalized to 98 mg/dL, and triglycerides decreased to 97.5 mg/dL. Metformin and dapagliflozin were discontinued, while tirzepatide was continued. The patient achieved diabetes remission according to international consensus criteria. This case demonstrates that early aggressive tirzepatide-based therapy may induce remission in early-stage type 2 diabetes mellitus.***

Keywords: tirzepatide therapy, type 2 diabetes remission, weight loss treatment, early diabetes management, lifestyle modification

1. Introduction

Type 2 diabetes mellitus (T2DM) is rapidly increasing among young adults, particularly in developing countries. Early-onset T2DM is associated with accelerated β-cell dysfunction, increased insulin resistance, and higher risk of long-term complications. Achieving diabetes remission has become an emerging therapeutic goal, especially in early disease. Tirzepatide, a dual glucose-dependent insulinotropic polypeptide and glucagon-like peptide-1 receptor agonist, has demonstrated strong glycemic and weight reduction effects in clinical trials. However, real-world evidence of remission, particularly in young Indian patients, remains limited. We report a case of rapid diabetes remission following tirzepatide-based multimodal therapy.

2. Case Report

A 28-year-old male presented with recent-onset type 2 diabetes mellitus and obesity. The patient had a sedentary lifestyle and no history of cardiovascular or renal disease.

The baseline clinical characteristics of the patient are summarized in Table 1.

Treatment

The patient was initiated on tirzepatide at a starting dose of 2.5 mg administered subcutaneously once weekly, which was titrated to 5 mg weekly after one month. Concurrent oral therapy included metformin 1000 mg/day and dapagliflozin 10 mg/day. Structured lifestyle intervention consisted of a calorie-restricted diet and regular physical exercise.

Follow-Up and Outcome

At one month, body weight decreased by 6 kg. Mild gastrointestinal adverse effects were reported but resolved spontaneously. At three months, total weight reduction reached 11 kg (Figure 1). HbA1c improved to 5.02%, fasting plasma glucose normalized to 98 mg/dL, and triglycerides decreased to 97.5 mg/dL. Metformin and dapagliflozin were discontinued while tirzepatide was continued. The patient achieved diabetes remission according to international consensus criteria.

Written informed consent was obtained from the patient for publication.

3. Discussion

This case demonstrates rapid diabetes remission achieved with early tirzepatide-based multimodal therapy. Tirzepatide exerts dual incretin effects, improving insulin secretion, reducing glucagon levels, delaying gastric emptying, and promoting significant weight loss. Clinical trials have shown substantial glycemic and weight reduction, but real-world remission data remain limited. Early aggressive therapy may preserve β-cell function and prevent long-term complications. However, long-term follow-up is required to determine durability of remission. The primary limitation of this report is its single-case design.

4. Conclusion

Early tirzepatide-based multimodal therapy can induce rapid remission in recent-onset type 2 diabetes mellitus. This approach may support remission-oriented management strategies, particularly in young adults with obesity.

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Tables

Table 1: Baseline clinical characteristics of the patient

Parameter	Value
Height	171 cm
Weight	90 kg
Body mass index (BMI)	30.8 kg/m²
Waist circumference	120 cm
Blood pressure	125/87 mmHg
Pulse	118 bpm
SpO_2	98%
Fasting plasma glucose	164 mg/dL
Postprandial blood glucose	270 mg/dL
HbA1c	6.69%
Triglycerides	328.2 mg/dL
Concurrent medications	Levothyroxine 50 mcg/day

Figures

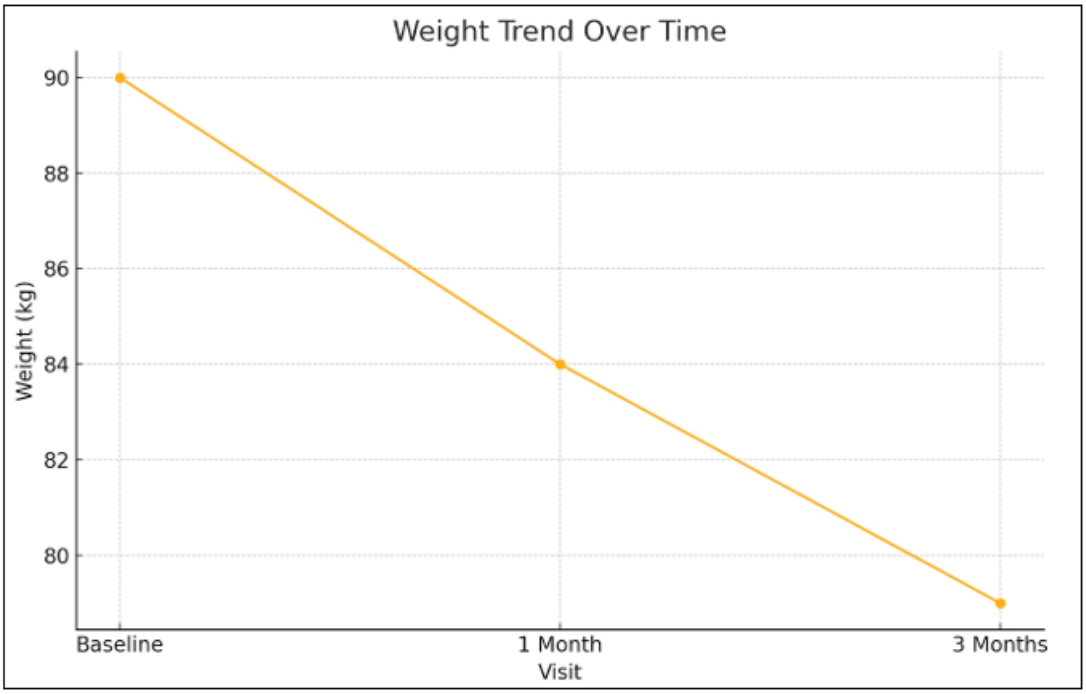

Figure 1: Weight trend over time
Figure Legend: The graph illustrates progressive reduction in body weight from baseline to 1 month and 3 months following tirzepatide-based therapy.