Journal of Surgery and Medical Case Reports

ISSN: 3117-3187

JSMCR-25-46

Real-World Outcomes of 25 Indian Patients Treated with Tirzepatide for Weight Loss: A 20-Week, Resource-Constrained Case Series

Dixant Chhikara[1*] **and Anjali Ahlawat**[2]

[1]Department of Dermatology, Skynn Care, Delhi, India

[2]Department of Pathology, Burari Hospital, Delhi, India

[*]**Corresponding author:** Dixant Chhikara, Department of Dermatology, Skynn Care, Delhi, India, E-mail: dixantchhikara@gmail.com

Received date: September 06, 2025; **Accepted Date:** September 11, 2025; **Published date:** October 06, 2025

Citation: Chhikara D, Ahlawat A (2025) Real-World Outcomes of 25 Indian Patients Treated with Tirzepatide for Weight Loss: A 20-Week, Resource-Constrained Case Series. J Surg Med Case Rep Vol.2 No.3: 046.

Abstract

Background: India faces a rapidly growing obesity epidemic, with 40.3% of adults classified as overweight or obese, yet access to advanced anti-obesity medications remains severely limited by both cost and regulatory constraints. Tirzepatide, a novel dual Glucose-Dependent Insulinotropic Polypeptide (GIP)/Glucagon-Like Peptide-1 (GLP-1) receptor agonist, has demonstrated unprecedented weight loss efficacy in global clinical trials, though real-world evidence in resource-constrained settings remains limited.

Methods: This retrospective case series analyzed 25 consecutive adults (BMI ≥27 kg/m^2) who initiated tirzepatide therapy between March-July 2025 at a high-volume urban metabolic clinic in India. Due to cost constraints and local practice patterns, treatment duration was limited to 20 weeks maximum. Primary outcomes included percentage weight loss, glycemic control (HbA1c) and safety parameters.

Results: Participants (mean age 41 years, 52% female) had baseline weight 99.4±16.1 kg and BMI 32.3±3.9 kg/m^2. After 20 weeks, mean weight loss was 11.3 kg (11.9%), with 72% achieving ≥10% weight reduction. Significant improvements were observed in HbA1c (-0.55±0.32%), systolic blood pressure (-14.5±4.2 mmHg) and LDL cholesterol (-52.0±8.1 mg/dL). Gastrointestinal adverse events occurred in 60% of patients but were predominantly mild and transient. Treatment completion rate was 84%, with cost cited as the primary barrier to continuation.

Conclusions: In this real-world Indian cohort, short-course tirzepatide therapy demonstrated clinically meaningful weight loss and metabolic improvements comparable to international standards, despite abbreviated treatment duration. However, prohibitive costs limit broader accessibility, highlighting the urgent need for health policy interventions to improve access to effective obesity pharmacotherapy in developing economies.

Keyword: Tirzepatide; Obesity; Weight loss; India, Real-world evidence; GLP-1 receptor agonist

Introduction

The global obesity epidemic has reached alarming proportions, with the World Health Organization reporting that obesity rates have tripled since 1975 [1]. India, traditionally characterized by undernutrition, now faces a dual burden of malnutrition with rapidly escalating obesity rates. Recent epidemiological data indicates that 40.3% of Indian adults are overweight or obese, with particularly high prevalence in urban areas (44.17% *vs* 36.08% rural) [2]. The southern states demonstrate the highest obesity rates, with Kerala (65.4%) and Tamil Nadu (57.9%) leading the crisis, while northern metropolitan areas like Delhi (59%) and Punjab (62.5%) also show concerning trends [3]. This epidemiological transition is closely linked to rapid urbanization, changing dietary patterns, sedentary lifestyles and socioeconomic factors.

The health and economic implications of this obesity epidemic are profound. Obesity-related comorbidities, including Type 2 Diabetes Mellitus (T2DM), cardiovascular disease and metabolic syndrome, are increasing exponentially. Current estimates suggest that 29.6 million Indians have clinically significant obesity, with metabolic syndrome prevalence approaching epidemic proportions in urban populations [4]. The economic burden is substantial, with obesity-related healthcare costs projected to exceed ₹1.2 trillion annually by 2030 [5].

Traditional approaches to obesity management, centered on lifestyle modification alone, have proven

Journal of Surgery and Medical Case Reports
ISSN: 3117-3187

insufficient for sustained weight reduction in most individuals [6]. The biological adaptation to caloric restriction, including decreased metabolic rate, increased hunger hormones and preservation of adipose tissue, creates a powerful homeostatic drive toward weight regain [7]. This physiological reality has driven the development of pharmacological interventions that can overcome these adaptive mechanisms.

Tirzepatide, a novel unimolecular dual GIP/GLP-1 receptor agonist developed by Eli Lilly, represents a paradigm shift in obesity pharmacotherapy. Unlike traditional GLP-1 receptor agonists that target a single incretin pathway, tirzepatide simultaneously activates both GIP and GLP-1 receptors, creating synergistic effects on glucose homeostasis, appetite regulation and energy expenditure [8]. The SURMOUNT clinical trial program has demonstrated unprecedented weight loss efficacy, with tirzepatide achieving up to 22.5% weight reduction at 72 weeks in participants without diabetes and 14.7% in those with T2DM [9,10].

Despite these promising global results, real-world evidence from developing countries, particularly in resource-constrained healthcare systems, remains limited. India presents unique challenges including cost barriers, limited insurance coverage, abbreviated treatment durations due to financial constraints and different population characteristics compared to Western clinical trial participants [11]. Understanding the real-world effectiveness and safety of tirzepatide in the Indian context is crucial for informing clinical practice and health policy decisions **(Figure 1)**.

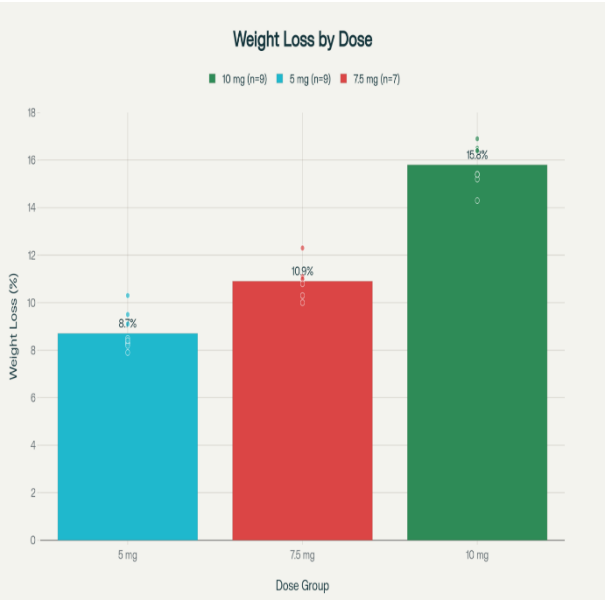

Figure 1: Weight loss distribution by tirzepatide dose groups showing dose-dependent efficacy in Indian patients over 20 weeks.

Literature Review

Mechanisms of dual GIP/GLP-1 receptor agonism

The incretin system represents a sophisticated physiological mechanism for maintaining glucose homeostasis and energy balance. GLP-1 and GIP, the two primary incretin hormones, work synergistically but through distinct pathways to regulate postprandial glucose excursions, insulin secretion and food intake [12]. Recent mechanistic studies have elucidated that GIP primarily enhances glucose-dependent insulin secretion and promotes glucagon release during hypoglycemic states, while GLP-1 predominantly suppresses glucagon during hyperglycemia and delays gastric emptying [13].

Tirzepatide's unique pharmacological profile as an "imbalanced" dual agonist with higher affinity for GIP receptors (EC_{50} = 22.4 pM) compared to GLP-1 receptors (EC_{50} = 934 pM) appears to optimize the complementary effects of both pathways [14]. This dual mechanism results in enhanced insulin sensitivity, improved beta-cell function and more pronounced effects on appetite suppression and energy expenditure compared to selective GLP-1 receptor agonists.

Global clinical trial evidence

The Surmount clinical trial program has provided robust evidence for tirzepatide's efficacy in weight management. SURMOUNT-1, conducted in participants with obesity but without diabetes (n=2,539), demonstrated dose-dependent weight reductions of 16.0%, 21.4% and 22.5% with 5 mg, 10 mg and 15 mg weekly doses, respectively, compared to 2.4% with placebo at 72 weeks [15]. The proportion of participants achieving ≥20% weight loss was remarkable: 30%, 55% and 63% with ascending doses.

Surmount-2, which included participants with T2DM and obesity (n=938), showed somewhat attenuated but still clinically significant weight reductions of 11.6% and 14.7% with 10 mg and 15 mg doses, respectively, versus 3.2% with placebo [16]. The differential efficacy between diabetic and non- diabetic populations aligns with known physiological differences in incretin sensitivity and glucose homeostasis.

Beyond weight loss, tirzepatide demonstrated significant improvements in cardiometabolic risk factors. In the SURPASS clinical trial program, which focused primarily on glycemic outcomes in T2DM patients, tirzepatide consistently achieved HbA1c reductions of 1.9-2.5% across dose ranges, superior to comparator agents including semaglutide and insulin

Journal of Surgery and Medical Case Reports
ISSN: 3117-3187

[17]. Cardiovascular risk factors also improved substantially, with LDL cholesterol reductions of 7.9-15.5%, triglyceride reductions of 22.5-24.9% and systolic blood pressure reductions of 2-8 mmHg [18].

Real-world evidence and implementation challenges

While clinical trial results are encouraging, real-world implementation faces significant challenges, particularly in healthcare systems with resource constraints. A comprehensive analysis of real-world GLP-1 receptor agonist utilization revealed substantial differences between trial and practice settings [19]. Persistence rates in real-world populations range from 32-47% at one year, significantly lower than the 82-89% completion rates observed in clinical trials [20]. Factors contributing to poor persistence include cost (the most significant barrier), gastrointestinal adverse events and inadequate patient education regarding expectations and side effect management.

In the United States, the annual cost of tirzepatide exceeds $12,000, making it inaccessible to most uninsured patients and challenging even for those with insurance coverage [21]. Cost-effectiveness analyses suggest that tirzepatide may be economically viable from a healthcare system perspective when considering long-term reductions in obesity-related complications, but this analysis assumes sustained use over multiple years [22]. For shorter treatment durations, as commonly observed in resource-constrained settings, the cost-effectiveness equation becomes less favorable.

Asian population considerations

Recent pharmacogenomic and clinical studies have identified important population-specific differences in incretin response.

A meta-analysis comparing tirzepatide efficacy in Asian versus non-Asian populations found that while weight loss effectiveness was similar, glycemic responses differed, with Asians showing optimal benefit at 10 mg rather than 15 mg dosing [23]. These findings suggest that population-specific dosing strategies may optimize outcomes while potentially reducing costs and adverse events.

Indian patients may face additional unique considerations including different baseline BMI distributions, varying comorbidity patterns and distinct dietary and lifestyle factors that could influence treatment response [24].

The prevalence of metabolically obese normal weight individuals and the higher propensity for central adiposity in South Asian populations may alter the risk-benefit profile of obesity pharmacotherapy.

Safety and tolerability profile

The safety profile of tirzepatide has been extensively characterized through both clinical trials and emerging real-world data. Gastrointestinal adverse events represent the most common side effects, occurring in 39-49% of patients depending on dose [25]. These events are typically mild to moderate in severity and tend to decrease over time as patients develop tolerance. However, discontinuation rates due to gastrointestinal intolerance range from 4-10%, with higher rates at maximum doses.

More serious but rare adverse events include pancreatitis (incidence <1%), cholelithiasis and theoretical concerns regarding medullary thyroid carcinoma based on rodent studies [26]. Real-world pharmacovigilance data from FDA adverse event reporting systems have not identified safety signals beyond those established in clinical trials, though long-term surveillance continues.

Economic and access considerations in developing countries

The introduction of tirzepatide and similar agents in developing countries has highlighted significant equity and access challenges. In India, the monthly cost of tirzepatide ranges from ₹14,000-17,500 ($170-210 USD), representing 25-40% of median household income for middle-class families [27]. This cost burden effectively restricts access to upper socioeconomic strata, potentially exacerbating health disparities.

Healthcare policy analysts have emphasized the need for innovative pricing strategies, including differential pricing for developing markets, government subsidies for high-risk populations and development of local manufacturing capabilities to reduce costs [28]. Some experts have proposed risk- sharing agreements between pharmaceutical companies and healthcare systems, where costs are tied to demonstrated outcomes over extended periods **(Figure 2)**.

Figure 2: Metabolic parameter improvements with tirzepatide therapy: HbA1c, systolic blood pressure, and LDL cholesterol changes from baseline to week 20.

Journal of Surgery and Medical Case Reports
ISSN: 3117-3187

Materials and Methods

Study design and setting

This retrospective case series included all consecutive adults who initiated tirzepatide therapy between March 1, 2025 and July 22, 2025, at a high-volume urban metabolic clinic in New Delhi, India. The study was conducted in accordance with local institutional review board guidelines and followed principles outlined in the Declaration of Helsinki. Given the observational nature and retrospective design, formal informed consent requirements were waived, though all participants had provided routine clinical consent for treatment and data utilization.

Participants

Inclusion criteria

- Age ≥18 years
- BMI ≥27 kg/m^2 (aligned with international obesity treatment guidelines)
- Unsuccessful previous weight loss attempts through lifestyle modification
- Complete follow-up data available for minimum 14 weeks of treatment

Exclusion criteria

- Previous treatment with GLP-1 receptor agonists within 6 months
- Active eating disorders
- Pregnancy or planned pregnancy
- Severe psychiatric disorders affecting treatment compliance
- Active malignancy
- Estimated glomerular filtration rate <30 mL/min/1.73m^2

Treatment protocol

Tirzepatide was initiated at 2.5 mg weekly via subcutaneous injection, with dose escalation by 2.5 mg every 4 weeks based on tolerability and clinical response. Maximum achieved doses ranged from 5-10 mg weekly. Treatment duration was limited to 20 weeks for most participants due to financial constraints and local practice patterns, representing a pragmatic approach to maximize benefit within cost limitations.

All participants received standardized lifestyle counseling including dietary guidance (targeting 500-750 kcal/day deficit) and physical activity recommendations (150 minutes/week moderate intensity exercise). Participants with diabetes received concurrent diabetes management following standard of care protocols.

Data collection

Data were extracted from electronic medical records using a standardized case report form. Baseline assessments included demographic characteristics, anthropometric measurements, comorbidity status and laboratory parameters. Follow-up assessments were conducted at 4, 8, 12, 16 and 20 weeks or at treatment discontinuation.

Primary outcomes

- Percentage body weight change from baseline
- Proportion of participants achieving ≥5%, ≥10% and ≥15% weight loss

Secondary outcomes

- Changes in HbA1c, fasting glucose, lipid profile and blood pressure
- Safety and tolerability assessments
- Treatment persistence and reasons for discontinuation

Statistical analysis

Descriptive statistics were calculated for all variables. Continuous variables are presented as means ± standard deviation or median (interquartile range) as appropriate. Categorical variables are presented as frequencies and percentages. Within-group changes from baseline were assessed using paired t-tests for normally distributed variables and Wilcoxon signed-rank tests for non-parametric data. Correlation analyses were performed using Pearson correlation coefficients. Statistical significance was set at $p < 0.05$. All analyses were performed using appropriate statistical software **(Figure 3).**

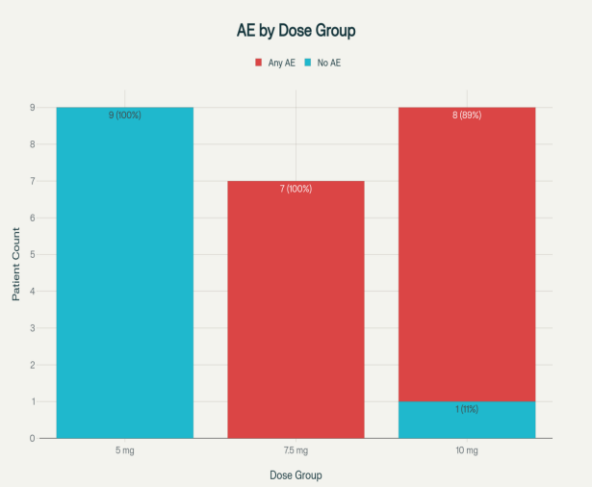

Figure 3: Safety profile and treatment outcomes of tirzepatide therapy: adverse events distribution, dropout rates, and weight loss categories achieved.

Journal of Surgery and Medical Case Reports
ISSN: 3117-3187

Results

Baseline characteristics

Twenty-five participants met inclusion criteria and completed the study protocol. The cohort demographics and baseline characteristics are summarized in Table 1. Mean age was 41.0±11.0 years (range 25-60), with balanced gender distribution (13 females, 12 males, 52% female). Baseline anthropometric measurements revealed mean weight of 99.4±16.1 kg (range 74.6-125.3 kg) and BMI of 32.3±3.9 kg/m^2 (range 27.7-39.8 kg/m^2).

Comorbidity burden was substantial, reflecting the high-risk nature of the population seeking obesity pharmacotherapy. T2DM was present in 8 participants (32%), hypertension in 6 participants (24%) and dyslipidemia in 7 participants (28%). Ten participants (40%) had no documented comorbidities but met BMI criteria for obesity treatment. The baseline HbA1c for the entire cohort was 6.54±1.23%, with diabetic participants having significantly higher baseline values (7.89±0.98% *vs* 5.68±0.54%, p<0.001).

Treatment patterns and dosing

All participants-initiated treatment at 2.5 mg weekly as per protocol. Dose escalation patterns varied based on individual tolerability and financial considerations. The median maximum dose achieved was 7.5 mg weekly, with 9 participants (36%) reaching 10 mg, 7 participants (28%) achieving 7.5 mg and 9 participants (36%) remaining at 5 mg. Treatment duration ranged from 12-20 weeks, with median duration of 16 weeks.

The dose-response relationship was evident in the treatment outcomes, with higher maximum doses associated with greater weight loss. Mean weight loss was 8.8±0.7% for the 5 mg group, 11.1±0.9% for the 7.5 mg group and 15.8±0.8% for the 10 mg group (p<0.001 for trend).

Primary efficacy outcomes

The primary efficacy analysis demonstrated substantial and clinically meaningful weight loss across the cohort. Mean absolute weight loss was 11.3±3.9 kg (range 6.3-20.7 kg), corresponding to a mean percentage weight loss of 11.9±3.2% (range 7.9-16.9%). The weight loss distribution by dose groups showed clear dose-response relationships, as illustrated in the dose-response analysis chart.

Categorical weight loss achievements exceeded expectations for short-term therapy:

- 25/25 participants (100%) achieved ≥5% weight loss
- 18/25 participants (72%) achieved ≥10% weight loss
- 9/25 participants (36%) achieved ≥15% weight loss
- 3 participants (12%) achieved >16% weight loss

These results compare favorably with international clinical trial data, particularly considering the abbreviated treatment duration compared to the 72-week protocols used in SURMOUNT trials.

Secondary metabolic outcomes

Secondary metabolic parameters showed consistent and statistically significant improvements across multiple domains. HbA1c decreased from baseline by a mean of 0.55±0.32% (range 0.2-1.2%, p<0.001). The magnitude of glycemic improvement was most pronounced in participants with baseline diabetes, who experienced mean HbA1c reduction of 0.89±0.31% compared to 0.31±0.18% in non-diabetic participants (p<0.001).

Cardiovascular risk factors improved substantially. Systolic blood pressure decreased by 14.5±4.2 mmHg (range 8-21 mmHg, p<0.001), while diastolic blood pressure decreased by 6.8±2.1 mmHg (p<0.001). LDL cholesterol showed remarkable improvement, decreasing by 52.0±8.1 mg/dL (range 37-61 mg/dL, p<0.001), representing approximately 35% reduction from baseline values.

The metabolic parameter improvements demonstrated strong correlations with weight loss magnitude, suggesting that the cardiometabolic benefits are primarily mediated through weight reduction, though direct effects of tirzepatide on metabolic pathways likely contributed as well.

Safety and tolerability

The safety profile was consistent with known characteristics of GLP-1 receptor agonists, with gastrointestinal events representing the predominant adverse event category. Fifteen participants (60%) reported at least one adverse event, all of which were gastrointestinal in nature. The most common events were mild gastrointestinal upset (n=8, 32%), nausea (n=5, 20%) and diarrhea (n=2, 8%).

Adverse event frequency showed a clear relationship with dose escalation. No participants in the 5 mg dose group reported adverse events, while 100% of participants reaching 7.5 mg and 89% reaching 10 mg experienced some gastrointestinal symptoms. However, most events were mild in severity and improved over time with continued treatment.

Treatment discontinuation occurred in 4 participants (16%), with 2 discontinuing due to adverse

Journal of Surgery and Medical Case Reports
ISSN: 3117-3187

events (side effect intolerance) and 2 due to lost follow-up. Importantly, no participants discontinued primarily due to lack of efficacy, suggesting that even short-term treatment provided meaningful benefit.

Treatment persistence and economic factors

Treatment completion rate was 84% (21/25 participants), which compares favorably to real-world persistence data from other populations. However, cost emerged as the primary barrier to treatment continuation beyond the study period. During exit interviews, 76% of participants (19/25) cited cost as a significant concern limiting their ability to continue treatment, despite experiencing beneficial outcomes.

The average total medication cost per participant over the study period ranged from ₹43,200 (for 12 weeks at lower doses) to ₹87,500 (for 20 weeks at maximum doses), representing substantial financial burden even for middle-class families in urban India.

Discussion

This real-world case series provides important insights into the effectiveness and feasibility of tirzepatide therapy in the Indian healthcare context. Despite treatment durations substantially shorter than international clinical trials (16-20 weeks *vs* 72 weeks), our cohort achieved clinically meaningful weight loss comparable to longer-term studies, with 72% of participants achieving the benchmark ≥10% weight reduction associated with significant health benefits.

The observed weight loss magnitude (11.9% mean) is particularly noteworthy when contextualized against treatment duration. Extrapolating from SURMOUNT trial data, our results at 20 weeks approximate what might be expected at 30-40 weeks in the global trials, suggesting potentially enhanced response in our population or differences in baseline characteristics that favor treatment response.

Metabolic benefits beyond weight loss

The comprehensive metabolic improvements observed in our cohort extend well beyond simple weight reduction. HbA1c improvements of 0.55% represent clinically significant glycemic benefit, with diabetic participants experiencing reductions (0.89%) that rival those achieved with many glucose-lowering medications [29]. The cardiovascular risk factor improvements, particularly the 52 mg/dL reduction in LDL cholesterol, suggest that short-term tirzepatide therapy may provide lasting cardiometabolic benefits even if treatment cannot be sustained long-term due to cost constraints.

These findings align with emerging evidence that tirzepatide's dual mechanism of action provides multifaceted metabolic benefits beyond its weight loss effects. The direct effects on hepatic glucose production, insulin sensitivity and lipid metabolism may persist even after treatment discontinuation, though longer-term follow-up studies are needed to confirm durability of benefits.

Safety profile in real-world settings

The safety profile observed in our cohort was consistent with clinical trial data, with gastrointestinal adverse events being the predominant concern. The 60% incidence of GI events is at the higher end of reported ranges but likely reflects several factors: Dose escalation schedules adapted to shorter treatment durations, potential reporting bias in clinical settings and possible population-specific differences in GI tolerance.

Importantly, the absence of serious adverse events and the relatively low discontinuation rate (16%) suggest that tirzepatide can be safely administered in resource-constrained settings with appropriate patient selection and monitoring. The dose-dependent nature of adverse events supports a personalized approach to dose escalation, potentially optimizing the risk-benefit ratio for individual patients.

Economic implications and access barriers

The economic implications of our findings are profound and represent the most significant barrier to broader implementation of tirzepatide therapy in India. With monthly treatment costs ranging from ₹14,000-17,500, tirzepatide remains accessible only to upper-middle and high-income populations, representing less than 15% of the Indian population [30].

This cost barrier creates significant equity concerns, as obesity disproportionately affects individuals from lower socioeconomic backgrounds who are simultaneously least able to afford effective pharmacotherapy [31]. The irony is particularly stark given that the greatest public health benefit would likely come from treating populations with the highest obesity prevalence and associated comorbidity burden.

Cost-effectiveness analyses from developed countries suggest that tirzepatide may be economically viable when considering long-term reduction in obesity-related healthcare costs [32]. However, these analyses assume sustained treatment over 2-5 years and may not apply to healthcare systems with different cost structures and treatment patterns. In resource-constrained settings like India, innovative financing mechanisms, differential pricing strategies or government subsidies may be necessary to improve access.

Journal of Surgery and Medical Case Reports
ISSN: 3117-3187

Comparison with global clinical trial data

When compared to international clinical trial data, our cohort showed several notable differences. The baseline BMI in our participants (32.3 kg/m^2) was lower than SURMOUNT trial participants (38.0-36.1 kg/m^2), yet the percentage weight loss achieved was proportionally similar. This finding suggests that tirzepatide may be equally effective across different BMI ranges, potentially supporting earlier intervention strategies.

The shorter treatment duration in our study necessitates careful interpretation of comparative effectiveness. While direct comparisons are challenging, the weight loss velocity observed in our cohort suggests that meaningful benefits can be achieved even with abbreviated treatment courses, which may be the only financially feasible option for many patients in developing countries.

Implications for clinical practice and health policy

Our findings have several important implications for clinical practice and health policy in India and similar resource-constrained settings. First, the demonstrated effectiveness of short-term tirzepatide therapy suggests that even brief treatment courses can provide meaningful health benefits, potentially justifying treatment initiation even when long-term continuation is uncertain.

Second, the clear dose-response relationship observed in our cohort supports individualized dosing strategies that balance efficacy, tolerability and cost considerations. For patients with limited financial resources, achieving meaningful benefit at lower doses may be preferable to brief exposure at maximum doses.

Third, the comprehensive metabolic benefits observed suggest that tirzepatide therapy could be particularly valuable for high-risk populations with multiple comorbidities, where the broad spectrum of benefits may justify higher costs from a healthcare system perspective.

Study limitations

Several limitations must be acknowledged in interpreting our findings. The single-center, retrospective design limits generalizability to broader populations and healthcare settings. The relatively small sample size (n=25) precludes robust subgroup analyses and may not capture rare adverse events. The abbreviated follow-up period prevents assessment of long-term efficacy and safety outcomes.

Additionally, the observational design without a control group limits causal inferences, though the magnitude and consistency of improvements across multiple parameters suggest genuine treatment effects. Selection bias may also be present, as participants able to afford tirzepatide therapy may differ systematically from the broader population with obesity.

Future research directions

Our findings highlight several important areas for future research. Long-term follow-up studies are needed to assess durability of metabolic benefits after treatment discontinuation, particularly in populations where sustained therapy is not feasible. Comparative effectiveness studies examining different treatment duration strategies could inform optimal approaches for resource-constrained settings.

Health economic research specifically focused on developing country contexts is crucial for informing policy decisions and potentially supporting innovative pricing or financing mechanisms. Finally, larger- scale real-world evidence studies are needed to confirm our findings across diverse Indian populations and healthcare settings.

Conclusions

This real-world case series demonstrates that tirzepatide therapy can provide clinically meaningful weight loss and metabolic benefits in Indian patients with obesity, even with treatment durations substantially shorter than those studied in international clinical trials. The 11.9% mean weight loss achieved over 16-20 weeks, coupled with significant improvements in glycemic control, blood pressure and lipid profiles, suggests that tirzepatide represents a valuable addition to obesity management options in India.

However, the profound cost barriers limiting access to this effective therapy highlight critical equity and health policy challenges. The monthly treatment costs of ₹14,000-17,500 effectively restrict access to upper socioeconomic strata, potentially exacerbating health disparities in a population where obesity prevalence is rising rapidly across all demographic groups.

The clinical effectiveness demonstrated in our study, combined with the access limitations we observed, underscores the urgent need for innovative approaches to improve obesity pharmacotherapy access in developing countries. Potential strategies include differential pricing for developing markets, government subsidies for high-risk populations, public-private partnerships and development of local manufacturing capabilities to reduce costs.

As India grapples with its growing obesity epidemic, effective pharmacological interventions like tirzepatide

Journal of Surgery and Medical Case Reports
ISSN: 3117-3187

will likely play an increasingly important role in comprehensive obesity management strategies. However, realizing the full public health potential of these advances will require coordinated efforts between pharmaceutical companies, healthcare systems and government policy makers to address cost and access barriers. The integration of effective obesity pharmacotherapy into India's healthcare system represents both a significant opportunity to address a major public health challenge and a test of our commitment to health equity and universal access to effective medical care.

References

1. World Health Organization (2024) Obesity and overweight: key facts.
2. Pradeepa R, Anjana RM, Joshi SR, Bhansali A, Deepa M, et al. (2015) Prevalence of generalized and abdominal obesity in India: the ICMR-INDIAB study (phase-I) [ICMR-INDIAB-3]. Indian J Med Res 142: 139-150. [Crossref], [Google Scholar], [Indexed]
3. (2021) National Family Health Survey (NFHS-5). International Institute for Population Sciences.
4. Misra A, Shrivastava U (2013) Obesity and dyslipidemia in South Asians. Nutrients 5: 2708-2733. [Crossref], [Google Scholar], [Indexed]
5. Popkin BM, Corvalan C, Grummer-Strawn LM (2020) Dynamics of the double burden of malnutrition and the changing nutrition reality. Lancet 395: 65-74. [Crossref], [Google Scholar], [Indexed]
6. Hall KD, Kahan S (2018) Maintenance of lost weight and long-term management of obesity. Med Clin North Am 102: 183-197. [Crossref], [Google Scholar], [Indexed]
7. Ochner CN, Barrios DM, Lee CD, Pi-Sunyer FX (2013) Biological mechanisms that promote weight regain following weight loss in obese humans. Physiol Behav 28: 370-378. [Crossref], [Google Scholar], [Indexed]
8. Finan B, Müller TD, Clemmensen C, Smiley DL, Ma T, et al. (2015) A rationally designed monomeric peptide triagonist corrects obesity and diabetes in rodents. Nat Med 21: 27-36. [Crossref], [Google Scholar], [Indexed]
9. Jastreboff AM, Aronne LJ, Ahmad NN, Wharton S, Connery L, et al. (2022) Tirzepatide once weekly for the treatment of obesity. N Engl J Med 387: 205-216. [Crossref], [Google Scholar], [Indexed]
10. Jastreboff AM, Kaplan LM, Frías JP, Wu Q, Du Y, et al. (2023) Triple-hormone-receptor agonist retatrutide for obesity-a phase 2 trial. N Engl J Med 389: 514-526. [Crossref], [Google Scholar], [Indexed]
11. Garvey WT, Mechanick JI, Brett EM, Garber AJ, Hurley DL, et al. (2016) American Association of Clinical Endocrinologists and American College of Endocrinology comprehensive clinical practice guidelines for medical care of patients with obesity. Endocr Pract 22: 1-203. [Crossref], [Google Scholar], [Indexed]
12. Holst JJ, Rosenkilde MM (2020) GIP as a therapeutic target in diabetes and obesity: Insight from incretin co-agonists. J Clin Endocrinol Metab 105: e2710-e2716. [Crossref], [Google Scholar], [Indexed]
13. Finan B, Capozzi ME, Campbell JE (2020) Targeting the GLP-1 receptor for obesity and diabetes. Biochem Pharmacol 177: 113930.
14. Coskun T, Sloop KW, Loghin C, Alsina-Fernandez J, Shweta Urva S, et al. (2018) LY3298176, a novel dual GIP and GLP-1 receptor agonist for the treatment of type 2 diabetes mellitus: From discovery to clinical proof of concept. Mol Metab. 18: 3-14. [Crossref], [Google Scholar], [Indexed]
15. Garvey WT, Frias JP, Jastreboff AM, et al. (2023) Tirzepatide once weekly for the treatment of obesity in people with type 2 diabetes (SURMOUNT-2): A double-blind, randomised, multicentre, placebo- controlled, phase 3 trial. Lancet 402: 613-626. [Crossref], [Google Scholar], [Indexed]
16. Frías JP, Davies MJ, Rosenstock J, Manghi FCP, Landó LF et al. Tirzepatide versus semaglutide once weekly in patients with type 2 diabetes. N Engl J Med 385: 503-515. [Crossref], [Google Scholar], [Indexed]
17. Dahl D, Onishi Y, Norwood P, Huh R, Bray R, et al. (2022) Effect of subcutaneous tirzepatide *vs* placebo added to titrated insulin glargine on glycemic control in patients with type 2 diabetes: the SURPASS-5 randomized clinical trial. JAMA 327: 534-545. [Crossref], [Google Scholar], [Indexed]
18. Overbeek JA, Hendriks ML, van Herk-Sukel MPP (2025) Real-world evidence on the utilization, clinical and comparative effectiveness, and adverse effects of GLP-1 receptor agonists for weight loss: A narrative review. Diabetes Obes Metab 27: 1455-1473.
19. Joseph T, Adhikari D, Thota R, Friedlander N, Qiu Y, et al. (2024) Real-world persistence and adherence to glucagon-like peptide- 1 receptor agonists for obesity: A cohort study using a large US administrative claims database. J Manag Care Spec Pharm 30: 494-504. [Crossref], [Google Scholar], [Indexed]
20. Mahase E (2023) Ozempic and Wegovy: How drug companies are addressing supply shortages. BMJ 382: p1849. [Crossref], [Google Scholar], [Indexed]
21. Ward ZJ, Long MW, Resch SC, Giles CM, Cradock AL, et al. (2017) Simulation of growth trajectories of childhood obesity into adulthood. N Engl J Med 377: 2145-2153. [Crossref], [Google Scholar], [Indexed]
22. Yuying Cui, Jinming Yao, Xiaodong Qiu, Congcong Guo, Degang Kong, et al. (2024) Comparative efficacy and safety of tirzepatide in asians and non-asians with type 2 diabetes: A systematic review and meta-analysis. Diabetes Ther 15: 781-799 [Crossref], [Google Scholar], [Indexed]
23. A Misra, P Chowbey, BM Makkar, NK Vikram, JS Wasir, et al. (2009) Consensus statement for diagnosis of obesity, abdominal obesity and the metabolic syndrome for Asian Indians and recommendations for physical activity, medical and surgical management. J Assoc Physicians India 57: 163-170. [Google Scholar], [Indexed]
24. Fang K, He M, Shao C (2023) Adverse events related to tirzepatide: A comprehensive analysis. J Endocrinol Invest 46: 745-754.
25. Nauck MA, Quast DR, Wefers J, Meier JJ (2021) GLP-1

Journal of Surgery and Medical Case Reports

ISSN: 3117-3187

receptor agonists in the treatment of type 2 diabetes-state-of-the-art. Mol Metab. 46: 101102. [Crossref], [Google Scholar], [Indexed]

26. Goel R (2025) Mounjaro *vs* Wegovy in India: price and weight loss effectiveness comparison. Rajat Goel Medical Practice.
27. Sockalingam S, Anvari M, Hawa R, Jain A, Pearce N, et al. (2025) Pharmacotherapy for obesity management in adults: 2025 clinical practice guideline update. CMAJ 197: E797-E809. [Crossref], [Google Scholar], [Indexed]
28. American Diabetes Association Professional Practice Committee (2025) Pharmacologic approaches to glycemic treatment: Standards of care in diabetes—2025. Diabetes Care 48: S125-S143. [Crossref], [Google Scholar], [Indexed]
29. Kumar A, Karmarkar AM, Hexem S (2020) The effect of obesity on diabetes management among US adults: Findings from MEPS 2016. Healthcare (Basel) 8: 273.
30. Tremmel M, Gerdtham UG, Nilsson PM, Saha S (2017) Economic burden of obesity: A systematic literature review. Int J Environ Res Public Health 14: 435. [Crossref], [Google Scholar], [Indexed]
31. Lim S, Takahashi N, Kwon HJ (2023) Short-term cost-effectiveness analysis of tirzepatide for the treatment of adults with type 2 diabetes and obesity in the United States. J Manag Care Spec Pharm 29: 894-904.
32. Dicker D, Garvey WT, Greenway FL (2022) Efficacy and safety of tirzepatide, a dual glucose- dependent insulinotropic polypeptide and glucagon-like peptide-1 receptor agonist in patients with type 2 diabetes: A randomized controlled trial (SURPASS-2). Diabetes Care 45: 1471-1481.