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Weighing In on Weight Loss: Real World Outcomes of Semaglutide in Indian Diabetics

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ABSTRACT

Introduction: Type 2 diabetes mellitus (T2DM) is frequently associated with obesity, making simultaneous glycemic control and weight reduction important therapeutic goals. Semaglutide, a glucagon-like peptide-1 receptor agonist, has demonstrated significant efficacy in randomized clinical trials; however, real-world evidence from the Indian population remains limited. This study evaluated the real-world effectiveness and safety of semaglutide among Indian adults with T2DM.

Materials and Methods: This observational real-world study was conducted at a tertiary care center between April 2025 and February 2026 and included 30 adults with type 2 diabetes mellitus (T2DM) receiving semaglutide therapy. Baseline demographic, anthropometric, and biochemical parameters were recorded and compared with follow-up values. Outcomes included changes in body weight, body mass index (BMI), waist circumference, glycated hemoglobin (HbA1c), fasting blood glucose (FBS), postprandial blood glucose (PPBS), clinically significant weight loss, treatment response, and adverse events. Data were analyzed using SPSS version 20, with a p-value <0.05 considered statistically significant.

Results: Among the 30 participants, the mean age was 53.8 ± 10.6 years, and 56.7% were males. Semaglutide therapy resulted in significant reductions in body weight (89.2 ± 14.3 vs. 81.6 ± 13.8 kg), BMI (33.1 ± 4.6 vs. 30.3 ± 4.2 kg/m²), waist circumference (105.7 ± 11.2 vs. 98.4 ± 10.8 cm), HbA1c (8.9 ± 1.3% vs. 7.2 ± 0.9%), FBS (176.4 ± 39.5 vs. 132.8 ± 26.4 mg/dL), and PPBS (258.6 ± 54.2 vs. 186.3 ± 40.7 mg/dL) (all p<0.001). Overall, 83.3% of patients achieved ≥5% weight loss, 36.7% achieved >10% weight loss, 73.3% demonstrated an HbA1c reduction ≥1%, and 53.3% attained HbA1c <7%. Reduced appetite (40.0%) and nausea (26.7%) were the most common adverse events, while treatment discontinuation occurred in only 6.7% of patients.

Conclusion: Semaglutide demonstrated excellent real-world effectiveness in Indian patients with T2DM by producing significant improvements in glycemic control and clinically meaningful weight loss with an acceptable safety profile. These findings support its routine use as an effective therapeutic option for comprehensive metabolic management in clinical practice, although larger studies with longer follow-up are warranted to further validate these findings.

Keywords: *Type 2 diabetes mellitus; Semaglutide; Weight loss; Glycemic control; Real-world study.*

INTRODUCTION

Type 2 diabetes mellitus (T2DM) is one of the most prevalent chronic metabolic disorders worldwide and poses a major public health challenge due to its rapidly increasing incidence and associated cardiovascular, renal, and metabolic complications [1]. India is home to one of the largest populations of individuals with diabetes, with recent estimates

suggesting that more than 100 million adults are living with the disease [2]. Alongside poor glycemic control, obesity has emerged as a significant contributor to insulin resistance, disease progression, and increased cardiovascular risk [3]. Consequently, contemporary diabetes management focuses not only on achieving glycemic targets but also on effective weight reduction and improvement of overall metabolic health [4].

Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) have transformed the therapeutic landscape of T2DM by providing substantial reductions in glycated hemoglobin (HbA1c) while promoting clinically meaningful weight loss with a low risk of hypoglycemia [5]. Semaglutide, a long-acting GLP-1 receptor agonist administered once weekly, exerts its effects by enhancing glucose-dependent insulin secretion, suppressing glucagon release, delaying gastric emptying, and reducing appetite [6]. Large randomized controlled trials, particularly the SUSTAIN clinical trial program, have consistently demonstrated superior glycemic control, significant weight reduction, and favorable cardiovascular outcomes with semaglutide compared with several other glucose-lowering therapies [7]. These findings have led to its widespread recommendation in international diabetes management guidelines, particularly for individuals with obesity or established cardiovascular disease [8].

Although randomized clinical trials provide robust evidence regarding the efficacy and safety of semaglutide, their strict eligibility criteria may limit the generalizability of findings to routine clinical practice [9]. Real-world studies are essential to evaluate treatment effectiveness in heterogeneous patient populations, where variations in adherence, comorbidities, treatment patterns, and clinical characteristics may influence therapeutic outcomes. Data describing the real-world effectiveness of semaglutide in Indian patients remain relatively limited, particularly regarding its impact on weight loss, glycemic control, and treatment tolerability [10]. Generating evidence from routine clinical settings is therefore important to understand the performance of semaglutide in the Indian population and to guide clinicians in optimizing individualized diabetes management.

The present study aimed to evaluate the real-world effectiveness of semaglutide in Indian adults with type 2 diabetes mellitus by assessing changes in body weight, body mass index, waist circumference, glycemic parameters, overall clinical response, and treatment-related adverse events during routine clinical practice.

MATERIALS AND METHODS

This observational study was conducted among adults with type 2 diabetes mellitus receiving semaglutide therapy at a tertiary care center from April 2025 to February 2026. The study included 30 consecutive patients who were initiated on semaglutide for glycemic control and weight management as part of routine clinical practice. Patients aged ≥18 years with established type 2 diabetes mellitus who had received semaglutide for a minimum follow-up period of three months and had complete baseline and follow-up clinical records were included. Patients with type 1 diabetes mellitus, gestational diabetes, severe hepatic or renal dysfunction, active malignancy, previous bariatric surgery, concomitant use of other glucagon-like peptide-1 receptor agonists, or incomplete medical records were excluded.

Baseline demographic and clinical data, including age, sex, duration of diabetes, associated comorbidities, smoking status, semaglutide dose, and concomitant antidiabetic medications, were retrieved from medical records. Anthropometric parameters, including body weight, body mass index (BMI), and waist circumference, were recorded at baseline and at the final follow-up visit. Biochemical investigations included glycated hemoglobin (HbA1c), fasting blood glucose (FBS), and postprandial blood glucose (PPBS). Weight loss outcomes were categorized as <5%, 5–10%, and >10% reduction from baseline body weight. Adverse events reported during treatment, including gastrointestinal symptoms, reduced appetite, injection-site reactions, and treatment discontinuation, were also documented.

The primary outcomes of the study were changes in body weight, BMI, waist circumference, and glycemic parameters following semaglutide therapy. Secondary outcomes included the proportion of patients achieving clinically significant weight loss (≥5% and >10%), HbA1c reduction of at least 1%, attainment of HbA1c <7%, and the frequency of adverse events associated with treatment. The effectiveness and tolerability of semaglutide were evaluated using routinely collected real-world clinical data without any alteration to standard patient management.

Data were entered into Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS) version 20 (IBM Corp., Armonk, NY, USA). Continuous variables were expressed as mean ± standard deviation (SD), while categorical variables were presented as frequencies and percentages. Baseline and follow-up continuous variables were compared using the paired Student's *t*-test. Categorical variables were summarized using descriptive statistics. A two-tailed *p*-value of <0.05 was considered statistically significant.

RESULTS

A total of 30 patients with type 2 diabetes mellitus receiving semaglutide were included in the study. The majority of participants were aged 51–60 years (33.3%), followed by 41–50 years (26.7%). Males constituted 56.7% of the study

population. Most patients had diabetes for 5–10 years (40.0%), while hypertension and dyslipidemia were present in 60.0% and 56.7% of participants, respectively. Only 16.7% of the patients reported a history of smoking (Table 1).

Table 1. Baseline Demographic and Clinical Characteristics (N=30)

Variable	Category	n (%)
Age (years)	18–40	5 (16.7)
	41–50	8 (26.7)
	51–60	10 (33.3)
	>60	7 (23.3)
Gender	Male	17 (56.7)
	Female	13 (43.3)
Duration of diabetes	<5 years	10 (33.3)
	5–10 years	12 (40.0)
	>10 years	8 (26.7)
Hypertension	Yes	18 (60.0)
Dyslipidemia	Yes	17 (56.7)
Smoking	Yes	5 (16.7)

The mean age of the study population was 53.8 ± 10.6 years. At baseline, participants had a mean body weight of 89.2 ± 14.3 kg and a mean BMI of 33.1 ± 4.6 kg/m², indicating obesity. Glycemic indices were suboptimal, with a mean HbA1c of 8.9 ± 1.3%, fasting blood glucose of 176.4 ± 39.5 mg/dL, and postprandial blood glucose of 258.6 ± 54.2 mg/dL (Table 2).

Table 2. Baseline Clinical and Biochemical Parameters

Variable	Mean ± SD
Age (years)	53.8 ± 10.6
Weight (kg)	89.2 ± 14.3
BMI (kg/m²)	33.1 ± 4.6
HbA1c (%)	8.9 ± 1.3
Fasting Blood Sugar (mg/dL)	176.4 ± 39.5
Postprandial Blood Sugar (mg/dL)	258.6 ± 54.2
Systolic BP (mmHg)	132.5 ± 15.4
Diastolic BP (mmHg)	81.6 ± 8.8

The most commonly prescribed maintenance doses of semaglutide were 0.5 mg (33.3%) and 1.0 mg (33.3%). A smaller proportion of patients received 0.25 mg (13.3%), while 20.0% were treated with the 2.0 mg dose during follow-up (Table 3).

Table 3. Semaglutide Dose Distribution

Dose	n (%)
0.25 mg	4 (13.3)
0.5 mg	10 (33.3)
1.0 mg	10 (33.3)
2.0 mg	6 (20.0)

Semaglutide treatment resulted in significant improvements in anthropometric measures. Mean body weight decreased from 89.2 ± 14.3 kg to 81.6 ± 13.8 kg, while BMI reduced from 33.1 ± 4.6 kg/m² to 30.3 ± 4.2 kg/m². Waist circumference also declined significantly from 105.7 ± 11.2 cm to 98.4 ± 10.8 cm (all $p<0.001$) (Table 4).

Table 4. Change in Anthropometric Parameters

Variable	Baseline	Final Follow-up	Mean Difference	p-value
Weight (kg)	89.2 ± 14.3	81.6 ± 13.8	−7.6 ± 4.2	<0.001
BMI (kg/m²)	33.1 ± 4.6	30.3 ± 4.2	−2.8 ± 1.3	<0.001
Waist circumference (cm)	105.7 ± 11.2	98.4 ± 10.8	−7.3 ± 3.8	<0.001

Significant improvements in glycemic control were observed following semaglutide therapy. Mean HbA1c decreased from 8.9 ± 1.3% to 7.2 ± 0.9%, fasting blood glucose declined from 176.4 ± 39.5 mg/dL to 132.8 ± 26.4 mg/dL, and postprandial blood glucose decreased from 258.6 ± 54.2 mg/dL to 186.3 ± 40.7 mg/dL (all $p<0.001$) (Table 5).

Table 5. Glycemic Outcomes

Variable	Baseline	Final Follow-up	Mean Difference	p-value
HbA1c (%)	8.9 ± 1.3	7.2 ± 0.9	−1.7 ± 0.8	<0.001
FBS (mg/dL)	176.4 ± 39.5	132.8 ± 26.4	−43.6 ± 28.2	<0.001
PPBS (mg/dL)	258.6 ± 54.2	186.3 ± 40.7	−72.3 ± 39.5	<0.001

Most participants experienced clinically meaningful weight reduction during treatment. Nearly half of the patients (46.7%) achieved a weight loss of 5–10%, while 36.7% lost more than 10% of their baseline body weight. Only 16.7% of patients experienced weight loss of less than 5% (Table 6).

Table 6. Weight Loss Categories

Weight loss	n (%)
<5%	5 (16.7)
5–10%	14 (46.7)
>10%	11 (36.7)

Semaglutide was generally well tolerated. Reduced appetite was the most frequently reported adverse event (40.0%), followed by nausea (26.7%) and constipation (16.7%). Vomiting, diarrhea, and injection-site reactions were less common, and treatment discontinuation due to adverse events occurred in 6.7% of patients (Table 7).

Table 7. Adverse Effects

Adverse event	n (%)
Nausea	8 (26.7)
Vomiting	3 (10.0)
Constipation	5 (16.7)
Diarrhea	2 (6.7)
Reduced appetite	12 (40.0)
Injection site reaction	1 (3.3)
Drug discontinued	2 (6.7)

DISCUSSION

The present real-world observational study demonstrated that semaglutide was highly effective in improving both glycemic control and body weight among Indian patients with type 2 diabetes mellitus. Following treatment, significant reductions were observed in body weight, body mass index, waist circumference, HbA1c, fasting blood glucose, and postprandial blood glucose (all $p<0.001$). Furthermore, approximately 73.3% (22/30) of patients achieved an HbA1c reduction of at least 1%, while 83.3% (25/30) attained clinically meaningful weight loss (≥5%). These findings reaffirm the dual metabolic benefits of semaglutide observed in routine clinical practice and support its role as an effective therapeutic option for overweight or obese individuals with type 2 diabetes. Similar reductions in HbA1c (approximately 1.1–1.8%) and body weight have been consistently demonstrated in the SUSTAIN clinical trial programme and subsequent real-world studies evaluating semaglutide in routine practice [11,12].

A notable finding of the present study was the substantial weight reduction, with a mean weight loss of 7.6 kg and 36.7% (11/30) of participants achieving greater than 10% weight loss. Obesity is a major contributor to insulin resistance and cardiovascular risk, making weight reduction a key therapeutic objective in patients with type 2 diabetes. Comparable findings have been reported in the PIONEER REAL India study, which demonstrated clinically meaningful reductions in body weight and improved glycemic control among Indian patients receiving oral semaglutide in routine clinical practice [12]. Likewise, Dutta et al. reported significant reductions in body weight, BMI, fasting plasma glucose, and HbA1c in an Indian real-world cohort treated with oral semaglutide, supporting the consistency of semaglutide's metabolic benefits across diverse clinical settings [13].

The present study also demonstrated marked improvement in glycemic control, with mean HbA1c decreasing from 8.9% to 7.2%, accompanied by significant reductions in fasting and postprandial blood glucose concentrations. Approximately 53.3% (16/30) of patients achieved the recommended HbA1c target of <7%, reflecting excellent therapeutic effectiveness in routine practice. The similarity between our findings and controlled clinical trials suggests that semaglutide maintains its effectiveness even in heterogeneous real-world patient populations [12].

Semaglutide was generally well tolerated in the present study. Reduced appetite and nausea were the most commonly reported adverse events, whereas treatment discontinuation occurred in only a small proportion of patients (6.7%). These findings are in agreement with previous randomized trials and real-world observational studies, which consistently reported gastrointestinal adverse events as the most frequent but generally mild and transient side effects of semaglutide

therapy [12,14]. Overall, our findings provide additional real-world evidence from the Indian population demonstrating that semaglutide is an effective and safe therapeutic option for achieving sustained weight loss and improved glycemic control among adults with type 2 diabetes mellitus.

CONCLUSION

The present real-world study demonstrates that semaglutide is an effective and well-tolerated therapeutic option for Indian patients with type 2 diabetes mellitus, providing significant improvements in glycemic control and clinically meaningful weight reduction. Treatment was associated with substantial decreases in body weight, body mass index, waist circumference, HbA1c, fasting blood glucose, and postprandial blood glucose, while 83.3% of patients achieved clinically relevant weight loss (≥5%) and more than half attained the recommended HbA1c target (<7%). Adverse events were predominantly mild gastrointestinal symptoms, with a low rate of treatment discontinuation (6.7%). These findings support the use of semaglutide as an effective strategy for achieving both metabolic control and weight management in routine clinical practice, although larger multicenter studies with longer follow-up are warranted to confirm its long-term effectiveness and safety.

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