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Original Article

Real-world Evidence of Injection Semaglutide 2.4 mg in Indian Adults with Obesity: Effects on Weight Loss and Metabolic Outcomes

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Abstract

Introduction: Obesity, a serious chronic disease, is rapidly rising in India and is strongly linked to diabetes and cardiovascular complications, often at lower body mass index (BMI) levels in Asian Indians. Real-world evidence on injection semaglutide 2.4 mg in the Indian population remains limited following its recent approval, underscoring the need for clinical practice-based data.

Materials and Methods: This real-world, multicenter, retrospective, observational study conducted in India included 50 obese adults who were treated with injection semaglutide 2.4 mg. After 6 months of treatment, changes in anthropometric, body composition, and glycemic index were extracted from a structured clinical database. Changes from baseline to follow-up were evaluated using paired statistical tests, and responder rates (≥5% and ≥10% weight loss) were calculated, with analyses conducted on available-case data.

Results: Treatment with injection of semaglutide 2.4 mg resulted in significant reductions in weight, BMI, and body fat percentage. Mean body weight decreased by 13.39 ± 6.04 kg (estimated treatment difference), corresponding to a 14.7% relative reduction from baseline ($P < 0.001$). After around 6-month of treatment, BMI declined significantly by 5.02 ± 2.42 kg/m^2 ($P < 0.001$) and body fat percentage decreased by 5.27 ± 5.89 percentage points ($P < 0.001$), representing a 14.5% relative reduction with preservation of muscle mass. Fat loss constituted approximately one-third of total body weight reduction. Around 94% and 80% of patients achieved ≥5% and ≥10% weight loss, respectively. The glycated hemoglobin level decreased by 1.11% ($P < 0.001$), indicating improved glycemic control. Weight loss was consistent across dose groups and follow-up durations, with predominantly mild gastrointestinal adverse events and high patient-reported satisfaction (82%).

Conclusion: Injection of semaglutide 2.4 mg was found to be more efficacious and had a favorable safety profile in Indian adults with obesity, producing significant weight and fat loss, while preserving lean mass and supporting improvements in muscle function and metabolic parameters.

Key words: Body mass index, Fat mass, Glycemic index, Lean mass, Semaglutide, Weight

INTRODUCTION

Obesity, recognized as a serious chronic, complex disease by the World Health Organization, has been demonstrating an upward trend with respect to its prevalence and is emerging as a major global health concern.[1,2] Obesity is associated with an increased risk of non-communicable diseases (NCDs), including type 2 diabetes mellitus (T2DM) and cardiovascular disease (CVD), and other metabolic disorders.[2] Annually, around 5 million deaths are reported worldwide due to NCDs attributed to high body mass index (BMI), T2DM, CVD, cancer, neurological disorders, chronic respiratory diseases, and chronic kidney disease.[3]

After the United States and China, India ranks third globally in the number of people living with obesity.[1] Between 1990 and 2022, the prevalence of obesity increased from 1.2% to 9.8% in women and from 0.5% to 5.4% in men. A similar trend is observed in Indian children and adolescents, with

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prevalence increasing from 0.1% to 3.1% in girls and from 0.2% to 3.7% in boys.[2] In 2019, 5.79 lacs Indian adults succumbed to NCDs attributed to overweight or obesity (including those related to diabetes, CVD, stroke, and cancer).[1] Compared to the Western world, obesity-related comorbidities in India occur at a lower BMI. The economic burden of obesity in India has been reported to have escalated from ₹2.5 trillion in 2019 to ₹72 trillion in 2060, representing a 29-fold increase.[2] It is therefore imperative to prevent the adverse health consequences associated with obesity to address this ever-increasing health challenge.[1]

The metabolic risk associated with obesity is determined by the pattern of fat distribution.

Based on the location of fat accumulation in the body, obese individuals are classified into two body types: Gynecoid or pear-shaped (fat accumulation in the lower body, such as the hips and thighs) and android or apple-shaped (fat accumulation in the upper body, such as the visceral or abdominal region). Abdominal obesity or central obesity, a far more serious form of fat distribution, is associated with an increased risk of metabolic disorders and diseases.[1] Waist circumference (WC) and various waist-related indices, such as waist-to-hip ratio and waist-to-height ratio, are used to define abdominal obesity. Literature suggests that abdominal obesity and accumulation of visceral fat are extremely common in Asian Indians, thereby putting them at an increased risk of health consequences. According to the Indian Council of Medical Research -India Diabetes study, there are an alarming 254 million and 351 million adults with generalized and abdominal obesity, respectively.[3]

Factors Predisposing to Obesity: Indian Context

The factors contributing to a higher predisposition to obesity among Indians include:

Low BMI threshold

Among Indians, obesity and associated comorbidities occur at lower BMIs than in the Western world. Multiple pieces of evidence suggest that, for any given BMI or WC, Asians have around 3–5% higher adiposity or visceral fat, as compared to Caucasians.[4] According to the National Institute for Health and Care Excellence 2025, the cardiometabolic risk occurs at a lower BMI in people with South Asian, Chinese, other Asian, Middle Eastern, or African – suggesting the use of lower BMI thresholds as a practical measure of overweight and obesity.[5] The BMI cutoffs for Indians are:[6]

- Overweight: BMI 23–24.9 kg/m^2
- Obesity: BMI 25.0 kg/m^2 or above.

Normal weight central obesity

In individuals with a normal BMI, a high prevalence of central obesity is observed in around 34% of women and 18% of men.[7]

Thin fat

In Indians, sarcopenic obesity is characterized by excessive body fat mass and reduced muscle mass.[8]

High insulin resistance (IR)

Indians are reported to have high insulin resistance and elevated plasma insulin levels.[9]

Imbalance in low-density lipoprotein (LDL) and high-density lipoprotein (HDL)

Indians are reported to have high LDL and low HDL levels.[10]

Early onset of diabetes

Compared to the Western populations, the onset of T2DM among Indians is reported to occur nearly 2 decades earlier. This indicates a high prevalence of T2DM among young Indians.[11]

Carbohydrate-rich diet

The Indian diet includes a higher intake of carbohydrates and a lower intake of fruits and vegetables.[12,13]

Inactivity

More than 50% of Indians are physically inactive (70% the urban population and 57% of the rural population), and <10% are engaged in recreational physical activity.[14]

Management of Obesity

Obesity management should be personalized and delivered by a multidisciplinary team, combining medical nutrition therapy, physical activity, and psychological/behavioral interventions. Lifestyle interventions alone are often associated with limited long-term effectiveness, with weight maintenance remaining a major challenge. Despite the significant unmet need, anti-obesity medications (AOMs) are underutilized, with fewer than 1.5% of eligible patients receiving pharmacotherapy.[15]

In the last few years, glucagon-like peptide-1 (GLP-1) receptor agonists have emerged as a potential drug class for the management of obesity, offering dual benefits of weight loss and glycemic control in individuals with T2DM and other metabolic conditions. Drugs from this class that are approved for weight management include semaglutide, liraglutide, and tirzepatide.[16]

Earlier, orlistat was the only approved and available pharmacotherapeutic agent for obesity management in India.[17] Evidence suggests that orlistat provided modest weight loss of only 6.5% after 18 months of treatment.[18] Besides this, orlistat was associated with poor long-term compliance rates.[17] The introduction of subcutaneous semaglutide (Wegovy®) in June 2025 in India represents a significant milestone in obesity management. For the

1st time, patients in India have access to a pharmacological treatment shown to deliver sustained double-digit weight loss, enhance metabolic health, and lower cardiovascular risk. The once-weekly subcutaneous regimen is reported to provide improved adherence and convenience.[19]

Semaglutide was approved by the Food and Drug Administration for the management of obesity or overweight with comorbidities in June 2021 and by the European Medicines Agency in January 2022. Semaglutide promotes weight loss through central and peripheral mechanisms, thereby regulating appetite, energy balance, and metabolic function. The 94% similarity of semaglutide to human GLP-1, along with its high affinity and superior albumin binding, results in an extended half-life and broader clinical efficacy. Recent evidence suggests that semaglutide, beyond reducing glycated hemoglobin (HbA1c), also significantly impacts weight loss and positively affects cardiovascular, renal, and hepatic variables. Semaglutide has been reported to be significantly superior to glucose-lowering drugs (e.g., sitagliptin, insulin glargine, canagliflozin, or empagliflozin) or other GLP-1 receptor agonists (e.g., exenatide, liraglutide, or dulaglutide) in reducing body weight.[16] Several real-world studies have found substantial weight loss among patients treated with semaglutide.[20] Evidence also suggests that the use of semaglutide demonstrates metabolic benefits, including reduced total fat mass, improved hand grip strength, and a reduced prevalence of sarcopenic obesity.[21]

Compared to other weight loss medications, semaglutide has been found to produce substantially greater weight loss with a similar risk of adverse effects. Subcutaneous semaglutide (2.4 mg) is also a cost-effective alternative to other AOMs (liraglutide 3 mg, phentermine-topiramate, and naltrexone-bupropion).[16] The American Diabetes Association (2026) has recommended semaglutide for weight management in patients with and without complications [Figure 1].[22]

Owing to the relatively recent approval of this therapy, real-world evidence on the effectiveness of injection semaglutide 2.4 mg in the Indian population is not available.

To the best of our knowledge, this is the first real-world study assessing the effectiveness of injection semaglutide 2.4 mg (Wegovy®) in routine clinical practice, specifically evaluating semaglutide from Novo Nordisk for its impact on weight loss, body composition, metabolic outcomes, and tolerability. Semaglutide from Novo Nordisk is manufactured using a hybrid process that combines microbial fermentation with chemical synthesis. Given the complexity of this approach and the potential risk for impurities, stringent quality control measures are in place to ensure product safety, efficacy, and consistency. Therefore, the findings of this study are extremely significant, as they cannot be assumed to be reproducible with other generic formulations.

MATERIALS AND METHODS

Study Design and Data Source

This was a multicenter, retrospective observational study conducted across three clinics in an urban Indian setting. Data were extracted from the Healthplix electronic medical records of adults with obesity who were initiated on injection semaglutide 2.4 mg (brand name: Wegovy®), manufactured by Novo Nordisk, as part of routine clinical care. Body composition parameters were assessed using Body 270s. This real-world, retrospective study assess efficacy and safety of injection semaglutide in weight management. Patient-level data were extracted from a structured Excel database containing baseline assessments, treatment exposure, and follow-up measurements. The final analysis included 50 patients with available baseline and follow-up body-weight data.

Study Population

Adult patients who received injection semaglutide 2.4 mg and had documented baseline and at least one follow-up assessment of body weight were included in the analysis. Available variables included demographic characteristics, anthropometric measurements, body-composition parameters, glycemic indices, treatment dose, duration of follow-up, gastrointestinal side effects, and patient-reported treatment satisfaction.

Follow-up duration was defined as the time between baseline assessment and the most recent available follow-up visit.

Outcomes

Primary outcome

- Absolute and percentage change in body weight from baseline to follow-up.

Secondary outcomes

- Change in BMI
- Change in body fat percentage
- Change in muscle mass
- Change in glycated HbA1c
- Weight-loss responder rates, defined as:
  - ≥5% reduction in baseline body weight
  - ≥10% reduction in baseline body weight.

Safety and tolerability outcomes

- Incidence of side effects
- Patient-reported treatment satisfaction.

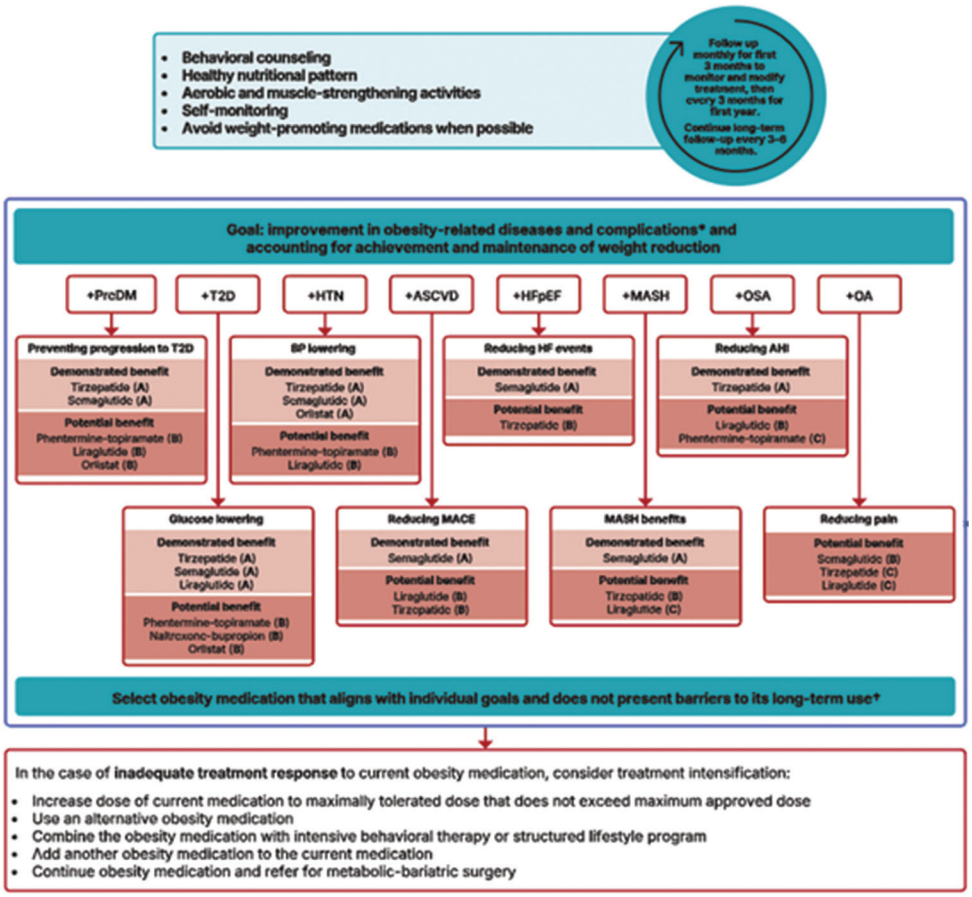

Figure 1: Obesity medications among adults with obesity-related diseases and complications.*Obesity medications are identified as "demonstrated benefit" if there is A-level evidence of benefit in the specified outcome for each obesity-related disease or complication. Obesity medications with B- or C-level evidence for these outcomes are identified as having "potential benefit." Obesity medications are listed in relative order of benefit, where medications with the greatest benefit are listed first; to date, no head-to-head trials have compared these outcomes in obesity medications. The level of evidence ratings are identified in parentheses. †Barriers to long-term use may include adverse medication effects, insurance coverage, out-of-pocket costs, etc. AHI: Apnea hypopnea index, ASCVD: Atherosclerotic cardiovascular disease, BP: Blood pressure, HF: Heart failure, HFpEF: Heart failure with preserved ejection fraction, HTN: Hypertension, MACE: Major adverse cardiovascular events, MASH: Metabolic dysfunction-associated steatohepatitis, OA: Osteoarthritis, and OSA: Obstructive sleep apnea, PreDM: Pre-diabetes, T2D: Type 2 diabetes

Statistical Analysis

Continuous variables were summarized as mean and standard deviation (SD), and categorical variables as counts and percentages. Paired within-patient comparisons between baseline and follow-up values were assessed using paired *t*-tests, with Wilcoxon signed-rank tests used as non-parametric sensitivity analyses.

Responder analyses were conducted by calculating the proportion of patients achieving predefined weight-loss thresholds (≥5% and ≥10%). Descriptive subgroup summaries were examined by maximum tolerated dose and duration of follow-up.

Analyses were performed using available-case data without imputation. HbA1c data were available for all 50 patients and were included in the final analysis. All analyses were exploratory in nature, and a two-sided $P < 0.05$ was considered statistically significant.

RESULTS

Study Population and Baseline Characteristics

A total of 50 patients from three centers (Ahmedabad, Rajkot, and Vadodara) were included in this multicenter retrospective real-world analysis. The mean age of the study population was 43.08 ± 11.55 years, with 26 (52.0%) female and 24 (48.0%) male participants. The mean follow-up duration was 5.65 ± 1.56 months. Nearly half of the patients (48.0%) achieved a maximum tolerated dose of semaglutide 2.4 mg during treatment.

Baseline demographic and cardiometabolic characteristics are summarized in Table 1.

Primary Outcome: Anthropometric Outcomes

At follow-up, statistically significant reductions were observed in weight, BMI, and body fat percentage. Mean body weight decreased by 13.39 ± 6.04 kg (estimated treatment difference

[ETD]), corresponding to a 14.7% relative reduction from baseline ($P < 0.001$) [Table 2, Figure 2].

BMI declined significantly by 5.02 ± 2.42 kg/m² ($P < 0.001$). Body fat percentage decreased by 5.27 ± 5.89 percentage points ($P < 0.001$), representing a 14.5% relative reduction [Table 2, Figure 3].

Importantly, there was no statistically significant reduction observed in muscle mass ($P = 0.520$), indicating preservation of lean mass during weight reduction [Table 2, Figure 3].

Table 1: Baseline demographic and cardiometabolic characteristics (*n*=50)

Variable	Value
Demographic characteristics	
Total patients	50
Age (years), mean±SD	43.08±11.55
Male, *n* (%)	24 (48.0)
Female, *n* (%)	26 (52.0)
Anthropometric parameters	
Weight (kg), mean±SD	91.28±13.18
BMI (kg/m²), mean±SD	34.41±4.53
Body fat (%), mean±SD	36.38±6.96
Muscle mass (kg), mean±SD	46.93±12.17
Glycemic parameters	
HbA1c (%), mean±SD	7.12±0.97
Fasting plasma glucose (mg/dL), mean±SD	112.67±29.25
Postprandial plasma glucose (mg/dL), mean±SD	140.50±49.82
Lipid profile	
Total cholesterol (mg/dL), mean±SD	193.18±40.69
LDL (mg/dL), mean±SD	125.72±39.09
HDL (mg/dL), mean±SD	38.41±8.78
Triglycerides (mg/dL), mean±SD	157.39±64.32
Liver function	
ALT (U/L), mean±SD	32.94±16.61
Treatment characteristics	
Follow-up duration (months), mean±SD	5.65±1.56
Maximum dose 1.0 mg, *n* (%)	6 (12.0)
Maximum dose 1.7 mg, *n* (%)	20 (40.0)
Maximum dose 2.4 mg, *n* (%)	24 (48.0)

HDL: High density lipoprotein, LDL: Low density lipoprotein, ALT: Alanine aminotransferase, SD: Standard deviation, BMI: Body mass index, HbA1c: Glycated hemoglobin

When interpreted relative to total weight reduction, fat loss accounted for approximately one-third of total body weight reduction, supporting favorable body composition changes rather than indiscriminate tissue loss.

Patients were categorized based on the percentage of weight loss achieved at the follow-up visit. A total of 3 patients (6%) achieved <5% weight loss, 7 patients (14%) achieved 5–10% weight loss, and 40 patients (80%) achieved >10% weight loss [Table 3]. Greater weight loss was associated with greater HbA1c reduction (trend $P = 0.008$). Even patients with <5% weight loss achieved meaningful HbA1c improvement (−0.97 ± 0.76%).

Glycemic Outcomes

Mean HbA1c decreased from 7.12 ± 0.97% at baseline to 6.21 ± 0.74% at the end of follow-up. The ETD was −0.91% ($P < 0.001$), reflecting clinically meaningful improvement in glycemic control alongside weight reduction [Table 4, Figure 3].

HbA1c Stratification by Baseline Category

When stratified by baseline HbA1c levels, greater absolute reductions were observed among patients with higher baseline glycemic burden [Table 5]. Patients with baseline HbA1c <7% experienced a mean reduction of 0.92 ± 0.29% ($P < 0.001$), corresponding to a 14.0% relative reduction. Those with baseline HbA1c between 7% and 9% demonstrated a greater reduction of 1.33 ± 0.43% (17.3% relative reduction; $P < 0.001$).

Patients with baseline HbA1c > 9% showed the largest absolute reduction (−2.45 ± 1.91%), corresponding to a 23.4% relative decrease; however, the difference was not statistically significant ($P = 0.321$) due to the very small sample size ($n = 2$).

Table 2: Changes in anthropometric parameters from baseline to follow-up

Parameter	Baseline	At follow-up	ETD (Mean change±SD)	Percentage change	95% CI	*P*-value
Weight (kg) (*n*=50)	91.28±13.18	77.89±11.34	−13.39±6.04	−14.7	−15.11–−11.67	<0.001
BMI (kg/m²) (*n*=50)	34.41±4.53	29.39±3.76	−5.02±2.42	−14.6	−5.71–−4.33	<0.001
Body fat (%) (*n*=50)	36.38±6.96	31.11±3.81	−5.27±5.89	−14.5	−6.94–−3.59	<0.001
Muscle mass (kg) (*n*=50)	46.93±12.17	47.15±12.32	+0.22±2.37	+0.4	−0.46–0.89	0.520

ETD: Estimated treatment difference, BMI: Body mass index, SD: Standard deviation, CI: Confidence interval

Table 3: Distribution of patients by weight loss category at follow-up (*n*=50)

Weight loss category	*n* (%)	Baseline weight (kg)	3-month weight (kg)	Absolute change (kg)	Percentage weight loss	HbA1c change (%)
<5% weight loss	3 (6)	90.73±20.36	88.47±19.07	−2.27±2.38	−2.4	−0.97±0.76
5–10% weight loss	7 (14)	89.79±12.49	81.87±11.49	−7.91±1.19	−8.8	−1.29±1.14
>10% weight loss	40 (80)	91.58±13.14	76.40±10.44	−15.18±5.22	−16.4	−1.11±0.37
Overall	50 (100)	91.28±13.18	77.89±11.34	−13.39±6.04	−14.5	−1.13±0.55

HbA1c: Glycated hemoglobin

This gradient of glycemic improvement across baseline categories is consistent with expected pharmacologic response patterns and supports greater benefit in individuals with higher baseline dysglycemia.

Dose- and Duration-based Descriptive Analyses

Descriptive analyses stratified by maximum tolerated dose demonstrated clinically meaningful weight reduction across all dose categories [Figure S1]. Among patients receiving the 1.0 mg dose ($n = 6$), the mean weight change was −12.78 kg, corresponding to a mean percentage reduction of −14.08%, with 83.3% achieving ≥10% weight loss. In the 1.7 mg group ($n = 20$), the mean weight change was −14.60 kg (−14.80%), and 80.0% achieved ≥10% weight loss. Among those receiving the 2.4 mg dose ($n = 24$), the mean weight change was −12.53 kg (−14.37%), and 79.2% achieved ≥10% weight loss. Overall, weight reduction was consistently observed across dose groups, with no marked differences in the magnitude of percentage weight loss [Table 6].

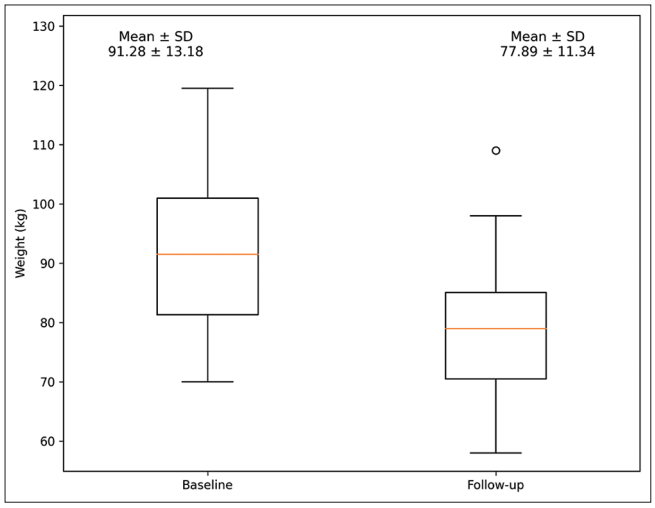

Figure 2: Change in body weight from baseline versus follow-up. ETD: Estimated treatment difference

The mean follow-up duration for the study population was 5.65 ± 1.56 months (range: 2.0–7.5 months). Weight reduction was observed across the entire duration spectrum. The descriptive examination did not suggest a strong dependence of percentage weight loss on follow-up duration within the observed time window, and meaningful reductions were observed in both shorter and longer follow-up intervals [Figure S2].

Safety and Tolerability

Gastrointestinal side effects were reported in 28 patients (56%), all of which were mild in nature, whereas 22 patients (44%) reported no gastrointestinal symptoms. No serious adverse events were recorded.

Patient-reported treatment satisfaction was generally favorable, with 82% of patients reporting "good" or "high" satisfaction.

DISCUSSION

This multicenter observational study demonstrated that injection of semaglutide 2.4 mg provides substantial, clinically meaningful reductions in body weight over a mean follow-up of approximately 6 months. Importantly,

Table 4: Changes in HbA1c

Parameter	Baseline	Follow-up	ETD	Percentage change	95% CI	*P*-value
HbA1c (%) (*n*=50)	7.12±0.97	6.21±0.74	−0.91±0.55	−12.8	−1.28–−0.97	<0.001

ETD: Estimated treatment difference, HbA1c: Glycated hemoglobin, CI: Confidence interval

Table 5: HbA1c reduction stratified by baseline HbA1c category

Baseline HbA1c category	*n*	Baseline HbA1c (Mean±SD)	Follow-up HbA1c (Mean±SD)	ETD (Mean change±SD)	Percentage change	*P*-value
<7%	30	6.57±0.24	5.64±0.28	−0.92±0.29	−14.0	<0.001
7–9%	18	7.68±0.53	6.35±0.36	−1.33±0.43	−17.3	<0.001
>9%	2	10.45±1.63	8.00±0.28	−2.45±1.91	−23.4	0.321

ETD: Estimated treatment difference, HbA1c: Glycated hemoglobin, SD: Standard deviation

Table 6: Dose- and duration-based weight-loss outcomes

Maximum tolerated dose	*n*	Mean follow-up (months) ±SD	Mean weight change (kg)±SD	Mean percentage weight change±SD	≥10% weight loss *n* (%)
1.0 mg	6	5.17±1.47	−12.78±6.17	−14.08±6.17	5 (83.3)
1.7 mg	20	5.78±1.52	−14.60±6.41	−14.80±6.41	16 (80.0)
2.4 mg	24	5.67±1.57	−12.53±5.79	−14.37±5.79	19 (79.2)

Data are presented descriptively. No formal statistical comparisons between dose groups were performed. SD: Standard deviation

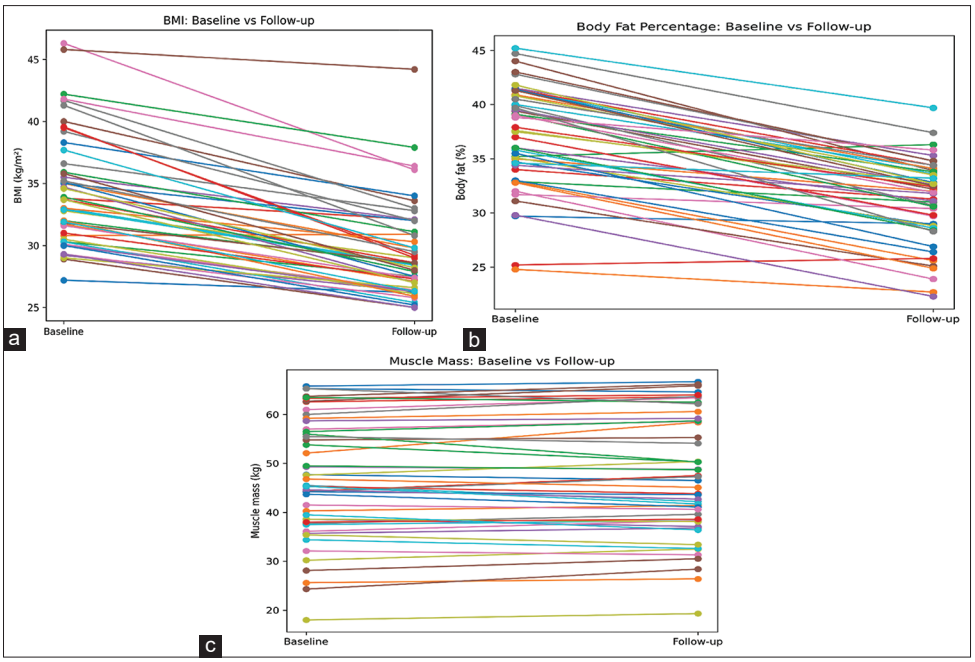

Figure 3: Change in body composition parameters. (a) Change in body mass index, (b) change in body fat percentage, (c) change in muscle mass

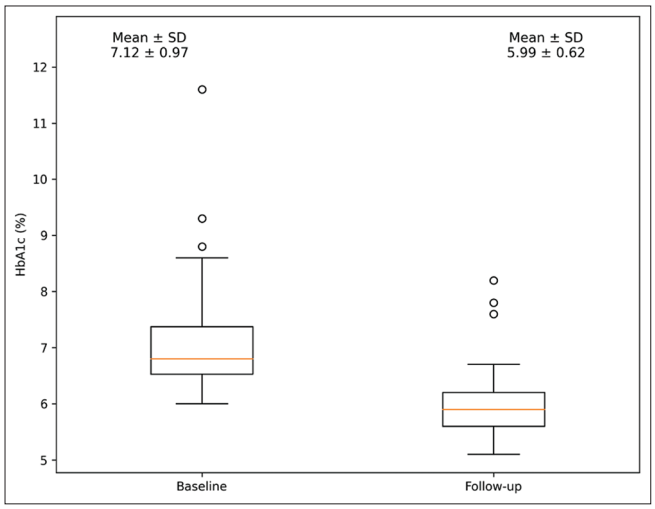

Figure 4: Change in glycated hemoglobin from baseline to follow-up. ETD: Estimated treatment difference

reductions in body weight were accompanied by significant improvements in body composition, characterized by decreases in BMI and body fat percentage with preservation of muscle mass. Individual-level analyses demonstrated that the majority of patients achieved weight-loss thresholds commonly associated with metabolic benefit.

This pattern suggests a favorable quality of weight loss, with preferential reduction in adiposity rather than lean tissue. Among patients with available data, glycemic control improved significantly, as reflected by a meaningful reduction in HbA1c.

The weight and BMI reductions observed in this study are comparable to or slightly greater than those reported in other real-world studies. A recent real-world retrospective study reported that in patients with obesity or overweight and diabetes (127/129 patients), treatment with injectable semaglutide 2.4 mg for 6 months resulted in a mean weight reduction of −10.4 ± 8.1 kg versus −13.39 kg, corresponding to a 14.7% reduction in our study, and a mean BMI reduction of −3.9 ± 3.0 kg/m versus −5.02 units, respectively.[23] In another real-world evidence, injection of semaglutide 2.4 mg at 6 months demonstrated a mean percent weight loss of −13.4% (SD 6.4) and a mean absolute change in BMI of −5.1 (SD 2.5) kg/m^2.[20]

The percentage of patients who lost weight in this study was higher than in other real-world studies. In a study by Toliver *et al*., about 73% of patients achieved ≥10% weight loss at 6 months, compared with 80% in our study.[20] The evidence also suggests that the weight loss with semaglutide is higher in an Asian population (20.6%) versus White (15.3%) or Black (15.0%) populations.[24-26]

The body fat percentage decreased by 5.27 ± 5.89 percentage points ($P < 0.001$), representing a 14.5% relative reduction with no loss in muscle mass. When evaluated relative to overall weight reduction, fat loss accounted for roughly one-third of the total body weight decrease, suggesting beneficial changes in body composition rather than non-selective tissue loss.

The changes in body fat mass and muscle mass in our study were in line with other studies, which show that semaglutide improves body composition by reducing fat mass and preserving lean mass.[27]

In addition, mean HbA1c decreased from 7.12 ± 0.97% at baseline to 6.21 ± 0.74% at the end of follow-up. The ETD was −0.91% ($P < 0.001$), indicating significant improvement in blood sugar levels alongside weight reduction [Figure 4].

Descriptive analyses across dose categories and follow-up durations showed broadly consistent weight-loss effects; however, these findings should be interpreted cautiously, given the exploratory nature of the analysis and the modest sample size. No dose-response or adjusted modeling was undertaken in this phase.

Treatment was generally well tolerated, with gastrointestinal side effects limited to mild symptoms and high levels of patient-reported satisfaction. No new safety concerns were identified.

Key limitations of this study are its retrospective design, small sample size, absence of a comparator group, variable follow-up duration, and missing data for certain metabolic parameters. As such, causal inferences cannot be drawn, and findings should be considered exploratory.

Overall, these findings provide supportive real-world evidence of meaningful weight loss, favorable body-composition changes, and metabolic improvement with injection of semaglutide 2.4 mg, supporting further evaluation in a larger dataset.

CONCLUSION

Obesity has emerged as a rapidly escalating health and economic challenge in India, compounded by the heightened metabolic risk observed at lower BMI thresholds in the Indian population. The high prevalence of central obesity and the early onset of metabolic disorders further intensify this burden.

Injection of semaglutide 2.4 mg is a highly effective, evidence-based therapeutic option for weight management, demonstrating substantial and sustained weight reduction, meaningful metabolic improvements, and a favorable safety profile.

As the first real-world Indian study evaluating this therapy, our findings provide valuable clinical evidence supporting its effectiveness in routine clinical practice. Beyond weight reduction, the study underscores the impact of injection of semaglutide 2.4 mg on body composition, lean mass preservation, muscle function, and metabolic efficiency. Collectively, these results reinforce the importance of a comprehensive, physiology-oriented approach to obesity management that extends beyond weight loss alone.

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SUPPLEMENTARY FIGURES

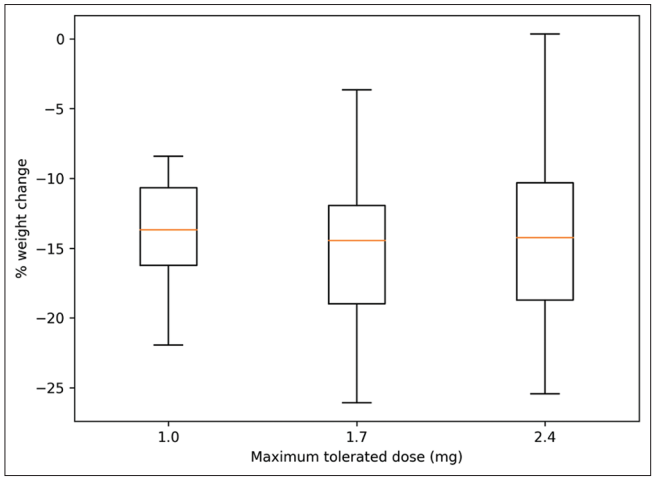

Figure S1: Weight change by maximum tolerated dose

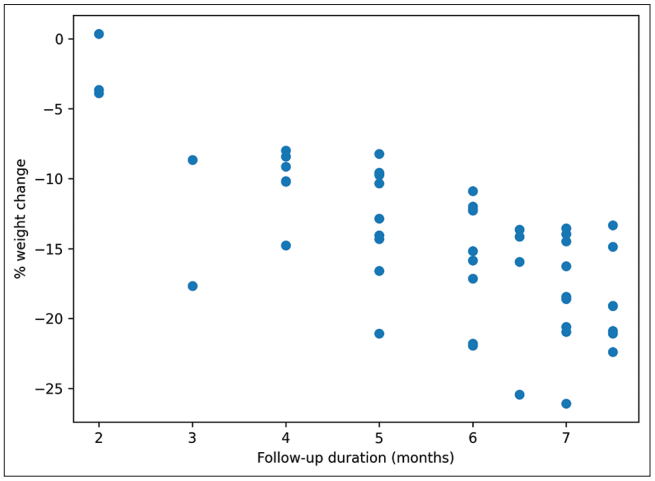

Figure S2: Follow-up duration versus weight change