EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Coden USA: EJBPBO
Volume: 13
Issue: 6
Year: 2026

SIGNIFICANT IMPROVEMENTS IN GLYCEMIC CONTROL AND CENTRAL OBESITY FOLLOWING INTEGRATED AYURVEDIC CDC PANCHAKARMA PROTOCOL IN TYPE 2 DIABETES: AN OBSERVATIONAL STUDY

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DOI: https://doi.org/10.5281/zenodo.20641195

How to cite this Article: Dr. Rohit Sane[1], Dr. Gurudatta Amin[2], Dr. Pravin Ghadigaonkar[3], Dr. Priyadarshini Bhalekar*[4], Dr. Shital More[5] (2026). Significant Improvements in Glycemic Control and Central Obesity Following Integrated Ayurvedic CDC Panchakarma Protocol in Type 2 Diabetes: An Observational Study. European Journal of Biomedical and Pharmaceutical Sciences, 13(6), 363–369.

Article Received on 15/05/2026 **Article Revised on 05/06/2026** **Article Published on 10/06/2026**

ABSTRACT

Background: Type 2 Diabetes Mellitus (T2DM) is frequently accompanied by central obesity, and concurrent management of hyperglycemia and visceral adiposity remains a challenging therapeutic goal. The CDC (Comprehensive Diabetes Care) Protocol — integrating Panchakarma bio-purification therapy (Snehan, Swedhan, Basti), the 800-kcal Prameha Diet Box, and individualized oral Ayurvedic herbal medications — was evaluated in a predominantly male T2DM cohort with high baseline HbA1c and significant central obesity.**Objective:** To evaluate the effect of the CDC Panchakarma Protocol with the Prameha Diet Box on glycemic control, body weight, and abdominal girth in T2DM patients at the Morwadi Pimpri clinic. **Methods:** Retrospective observational study of 49 T2DM patients (42 male, 7 female; mean age 47.3±9.4 years) treated at the Morwadi Pimpri Ayurvedic clinic between April 2025 and March 2026. Patients received CDC-SP (BMI ≥23 kg/m², n=46) or CDC-KP (BMI <23 kg/m², n=3) Panchakarma therapy alongside the Prameha Diet Box and individualized herbal medications. A mean of 8.6±3.7 Panchakarma sessions were administered per patient. Paired t-tests compared baseline and post-treatment values; $p<0.05$ was significant. **Results:** Highly significant improvements were demonstrated in HbA1c (9.02±1.37% → 7.70±1.59%; Δ −1.31%; $p<0.001$), RBS (219.9 → 180.4 mg/dL; Δ −39.5 mg/dL; $p=0.003$), body weight (Δ −2.07 kg; $p<0.001$), and abdominal girth (99.55 → 96.21 cm; Δ −3.33 cm; $p<0.001$). Post-treatment, 40.0% of patients achieved HbA1c <7.0%. Overall, 36.7% of patients reduced allopathic medication dosage, with 14.3% achieving complete discontinuation. **Conclusion:** The CDC Panchakarma Protocol produced significant improvements in both glycemic control and central adiposity in a predominantly male T2DM cohort with high baseline HbA1c. The concurrent significant reduction in abdominal girth alongside glycemic improvement underscores the protocol's capacity to address the dual metabolic burden of hyperglycemia and visceral obesity in T2DM.

KEYWORDS: *Type 2 Diabetes Mellitus; Panchakarma; Ayurveda; CDC Protocol; HbA1c; Central Obesity; Abdominal Girth; Prameha Diet; Glycemic Control; Male..*

1. INTRODUCTION

Type 2 Diabetes Mellitus (T2DM) and central obesity represent two closely interlinked components of the metabolic syndrome, each amplifying the pathophysiological severity of the other. Visceral adiposity drives insulin resistance through release of pro-inflammatory adipokines, free fatty acids, and resistin, while chronic hyperglycemia further promotes ectopic

fat deposition and systemic inflammation.[1,2] The concurrent management of glycemic control and central obesity is therefore not merely a cosmetic goal but a fundamental requirement for reducing cardiovascular risk and slowing diabetic progression. Despite this, most pharmacological strategies focus predominantly on glycemic endpoints, with limited direct impact on visceral adiposity.[3]

India carries the second-largest burden of T2DM globally, with approximately 77 million diagnosed cases, and the disease disproportionately affects working-age men — a demographic that is both economically and socially vulnerable to the long-term consequences of poor metabolic control.[4] The present study cohort from Morwadi Pimpri, Pune district, Maharashtra, is notable for its remarkably high proportion of male patients (85.7%), a high mean baseline HbA1c of 9.02%, and significant central adiposity — defining a population with both the greatest need for and potentially the greatest benefit from metabolic intervention.

Ayurveda, the classical Indian system of medicine, conceptualizes T2DM under the framework of Prameha — a metabolic-urinary disorder arising from Kapha dosha excess, Ama (metabolic waste) accumulation, and impaired tissue metabolism.[5] Crucially, Ayurvedic pathophysiology of Prameha recognizes the central role of medoroga (disorders of fat metabolism) and sthaulya (obesity) in diabetic causation and progression, providing an integrated framework for simultaneous glycemic and adiposity management that aligns closely with contemporary understanding.[6] The CDC (Comprehensive Diabetes Care) Protocol operationalizes this framework through three concurrent therapeutic modalities: BMI-stratified Panchakarma bio-purification, the 800-kcal Prameha Diet Box, and individualized oral herbal medications.

The Panchakarma component comprises Snehan (external oleation with Neem Siddha oil), Swedhan (sudation with Dashmukada herbal preparation), and Basti (medicated per-rectal enema). Basti employs either Kashaya (decoction-based) preparations for overweight patients (CDC-SP: BMI ≥23 kg/m²) or Taila (oil-based) preparations for lean patients (CDC-KP: BMI <23 kg/m²), using Gudmar (Gymnema sylvestre), Daru Haridra (Berberis aristata), and Yashti Madhu (Glycyrrhiza glabra) — herbs with documented antidiabetic, AMPK-activating, and anti-inflammatory mechanisms.[7,8,9] Snehan and Swedhan are proposed to mobilize visceral fat deposits through their Kapha-reducing and Ama-cleansing actions, and Neem Siddha oil has demonstrated lipolytic and anti-inflammatory properties in experimental models.[10] The Prameha Diet Box delivers 800 kcal/day with a low-carbohydrate, high-protein, high-fat macronutrient profile, integrating classical Ayurvedic dietary prescription for Prameha with the mechanistic evidence base for very low-calorie diets (VLCDs) in T2DM reversal and visceral fat reduction.[11,12] Caloric restriction at 800 kcal/day has been shown to reduce intrahepatocellular and intrapancreatic fat within weeks, restoring first-phase insulin secretion and hepatic insulin sensitivity, with concomitant reductions in waist circumference and visceral adiposity.[13] The present study evaluated the clinical outcomes of this integrated protocol with particular attention to both glycemic control and the central obesity endpoint — abdominal girth — in this high-risk, predominantly male cohort.

2. MATERIALS AND METHODS

2.1 Study Design and Setting

This was a retrospective observational study conducted at the Morwadi Pimpri branch of a multisite Ayurvedic diabetes care clinic, Pimpri-Chinchwad, Maharashtra, India. Clinical records of patients enrolled between April 2025 and March 2026 were reviewed. All data were derived from routinely maintained clinical records; no experimental procedures were performed for research purposes.

2.2 Participants

Inclusion criteria: (i) confirmed T2DM diagnosis; (ii) enrollment in a CDC DM Package care plan; (iii) receipt of at least one Panchakarma session; (iv) complete baseline and post-treatment data for primary outcome variables. Exclusion criteria: Type 1 or secondary diabetes; pregnancy or lactation; incomplete baseline records. Forty-nine patients meeting all criteria were included. Eleven patients had BMI recorded as zero in the source data (likely data entry omissions) and were excluded from BMI analysis; three CDC-KP patients had incomplete or anomalous records and were excluded from relevant subgroup calculations.

2.3 Intervention Protocol

All patients received three concurrent therapeutic components: (1) BMI-stratified Panchakarma (CDC-SP for BMI ≥23 kg/m², n=46; CDC-KP for BMI <23 kg/m², n=3); (2) the Prameha Diet Box (800 kcal/day, low-carbohydrate/high-protein/high-fat); and (3) individualized oral Ayurvedic herbal medications prescribed by the treating physician. Protocol details are described in Table 1. A total of 422 Panchakarma sessions were administered across the cohort (mean 8.6±3.7 per patient; range 0–16).

Table 1: CDC Panchakarma Protocol — Comparison of CDC-SP and CDC-KP Variants.

Component	CDC-SP Protocol (BMI ≥23 kg/m²)	CDC-KP Protocol (BMI <23 kg/m²)
Snehan (Oleation)	Neem Siddha oil — external massage	Neem Siddha oil — external massage
Swedhan (Sudation)	Dashmukada decoction steam therapy	Dashmukada decoction steam therapy
Basti (Per-rectal)	Kashaya Basti: Gudmar + Daru Haridra + Yashti Madhu (aqueous decoction)	Taila Basti: Gudmar + Daru Haridra + Yashti Madhu (oil-based preparation)
Target profile	Overweight/obese (Sthula Pramehi)	Normal/lean body weight (Krisha Pramehi)
Patients enrolled (n)	**46**	**3**

Kashaya = aqueous herbal decoction; Taila = oil-based herbal preparation; SP = Sthula Pramehi (overweight/obese); KP = Krisha Pramehi (normal/lean).

2.4 Outcome Measures

Clinical parameters were recorded at care plan initiation (baseline) and at the most recent clinic visit (post-treatment). Primary outcomes: HbA1c (%), RBS (mg/dL), body weight (kg), and abdominal girth (cm). Secondary outcomes: BMI (kg/m²), SBP and DBP (mmHg), heart rate (bpm). Lipid profile data were insufficient for analysis at this branch (n<3 complete paired records). Allopathic medication status was documented at Day 1 and last visit; percentage reduction was recorded as an integer value (0–100%).

2.5 Statistical Analysis

Continuous variables are expressed as mean ± standard deviation (SD). Paired two-tailed Student's t-tests compared baseline and post-treatment values. Zero values for weight, BMI, RBS, and HbA1c were treated as missing data and excluded from analysis. $p<0.05$ was considered statistically significant. Subgroup analysis for CDC-SP was descriptive; formal comparison with CDC-KP was not performed given the small KP subgroup (n=3).

2.6 Ethical Considerations

This study was conducted as a retrospective analysis of routinely collected clinical records in accordance with the ethical principles of the Declaration of Helsinki. All patient data were anonymized prior to analysis. [Insert ethics committee approval reference or waiver details prior to submission.].

3. RESULTS

3.1 Baseline Characteristics

Forty-nine patients were included: 42 male (85.7%) and 7 female (14.3%), with a mean age of 47.3±9.4 years (range 25–68). The predominantly male composition of this cohort is a noteworthy demographic feature. The majority of patients (73.5%) were in the 40–60 age group. Baseline HbA1c was 9.02±1.37% — the highest among all branches evaluated in this series — with 44.4% of patients having HbA1c exceeding 9.0% at enrollment, indicating a population with substantially poorly controlled diabetes at the point of care plan initiation. Primary diagnoses included T2DM alone (n=15, 30.6%), T2DM with hypertension (n=2, 4.1%), hypertension with DM and arthritis (n=2, 4.1%), and various metabolic combinations. Comorbid hypertension was present in 7 patients (14.3%), dyslipidemia in 4 (8.2%), and hypothyroidism in 3 (6.1%). Forty-six patients (93.9%) were allocated to CDC-SP. Baseline characteristics are summarized in Table 2.

Table 2: Baseline Demographic and Clinical Characteristics (n = 49).

Characteristic	Value (Mean ± SD)	Range / %
Total patients (n)	49	—
Sex (Male / Female)	42 / 7	85.7% / 14.3%
Age (years)	47.3 ± 9.4	25 – 68
Body Weight (kg)	76.0 ± 13.1	—
BMI (kg/m²) [n=38 with valid data]	27.4 ± 4.3	18.1 – 35.0
Abdominal Girth (cm) [n=42]	99.6 ± 10.1	—
HbA1c (%)	9.02 ± 1.37	—
RBS (mg/dL)	219.9 ± 78.9	—
SBP / DBP (mmHg)	118.2±33.2 / 77.2±22.4	—
Comorbid hypertension	7 (14.3%)	—
Comorbid dyslipidemia	4 (8.2%)	—
Comorbid hypothyroidism	3 (6.1%)	—
Protocol — CDC-SP / CDC-KP	46 / 3	—
Mean Panchakarma sessions	8.6 ± 3.7	0 – 16

Values expressed as mean ± SD unless stated. BMI data available for 38 patients (11 with zero values excluded). Abdominal girth data available for 42 patients.

3.2 Primary Outcomes: Glycemic Parameters

The CDC Protocol produced highly significant glycemic improvements in this cohort with high baseline HbA1c. Mean HbA1c declined from 9.02±1.37% to 7.70±1.59% (Δ −1.31±1.32 percentage points; −14.5%; p<0.001; t=6.644), with a large effect size reflecting the substantial glycemic burden in this population. Of the 20 patients (44.4%) with baseline HbA1c >9.0%, only 9 (20.0%) remained above this threshold post-treatment. Post-treatment, 40.0% of patients (n=18) achieved HbA1c <7.0% and 64.4% (n=29) achieved HbA1c <8.0%. Random blood sugar declined from 219.9±78.9 mg/dL to 180.4±85.1 mg/dL (Δ −39.5±84.9 mg/dL; −18.0%; p=0.003). At baseline, 24 patients (53.3% of those with valid RBS data) had RBS ≥200 mg/dL; post-treatment, 75.6% (n=34) of patients achieved RBS below 200 mg/dL.

3.3 Primary Outcomes: Anthropometric Parameters

Body weight declined significantly from 76.03±13.07 kg to 73.96±12.64 kg (Δ −2.07±3.08 kg; −2.7%; p<0.001). Nine patients (19.6%) achieved ≥5% body weight reduction and 12 patients (26.1%) achieved ≥3% reduction. A particularly notable finding was the highly significant reduction in abdominal girth from 99.55±10.13 cm to 96.21±9.05 cm (Δ −3.33±3.33 cm; −3.3%; p<0.001; t=6.482) among the 42 patients with complete abdominal girth data. This represents a clinically meaningful reduction in central adiposity, with 13 patients (31.0% of valid pairs) achieving ≥5 cm reduction in abdominal girth. The concurrent significance of both glycemic and central adiposity improvements in this cohort supports the protocol's capacity for integrated metabolic correction. BMI change was not statistically significant (Δ +1.09 kg/m²; p=0.521), likely reflecting the high standard deviation driven by outlier values in the dataset and the limited valid BMI pairs (n=38). Full results are presented in Table 3.

Table 3: Clinical Outcomes — Baseline vs. Post-Treatment Comparison.

Parameter	n	Baseline Mean±SD	Post-tx Mean±SD	Mean Change ±SD	%Δ	p-value
Glycemic parameters						
HbA1c (%)	45	9.02 ± 1.37	7.70 ± 1.59	−1.31 ± 1.32	−14.5	**<0.001 *****
RBS (mg/dL)	45	219.9 ± 78.9	180.4 ± 85.1	−39.5 ± 84.9	−18.0	**0.003 ****
Anthropometric parameters						
Body Weight (kg)	46	76.03 ± 13.07	73.96 ± 12.64	−2.07 ± 3.08	−2.7	**<0.001 *****
Abdominal Girth (cm)	42	99.55 ± 10.13	96.21 ± 9.05	−3.33 ± 3.33	−3.3	**<0.001 *****
BMI (kg/m²)	38	27.38 ± 4.28	28.47 ± 9.58	+1.09 ± 10.38	+4.0	0.521 ns
Cardiovascular parameters						
SBP (mmHg)	49	118.16 ± 33.17	116.61 ± 32.06	−1.55 ± 26.88	−1.3	0.688 ns
DBP (mmHg)	49	77.16 ± 22.36	75.33 ± 20.83	−1.84 ± 19.66	−2.4	0.516 ns
Heart Rate (bpm)	49	82.63 ± 24.65	80.67 ± 24.04	−1.96 ± 20.97	−2.4	0.516 ns
Lipid profile						

*Insufficient paired data available for lipid analysis at this clinic (n<3 for all parameters)Values expressed as mean ± SD. Paired two-tailed Student's t-test. ** p<0.01; *** p<0.001; ns = not significant. Post-tx = post-treatment. Valid n varies by parameter — see column n. Lipid data insufficient for analysis.*

3.4 Secondary Outcomes: Cardiovascular Parameters

No statistically significant changes were observed in systolic blood pressure (Δ −1.55±26.88 mmHg;

p=0.688), diastolic blood pressure (Δ −1.84±19.66 mmHg; p=0.516), or heart rate (Δ −1.96±20.97 bpm; p=0.516). The high standard deviations for SBP and DBP reflect the heterogeneous cardiovascular profile in this cohort, with some patients having normal baseline blood pressure and others having significant hypertension. The absence of significant change is consistent with a cohort in which hypertension, where present, was primarily managed pharmacologically and the study was not powered to detect blood pressure effects.

3.5 Allopathic Medication Status

Allopathic medication reduction was achieved in 18 of 49 patients (36.7%). Of these, 7 patients (14.3%) achieved complete discontinuation of all allopathic medications, while 11 patients (22.4%) achieved partial reductions ranging from 25% to 90%. Thirty-one patients (63.3%) showed no change in medication requirement. The medication distribution is detailed in Table 4.

Table 4: Allopathic Medication Reduction — Distribution by Category (n = 49).

Category	Reduction Level	n (patients)	% of cohort (n=49)
No reduction in allopathic medications	0%	31	63.3%
Partial reduction	25%	2	4.1%
Partial reduction	33%	1	2.0%
Partial reduction	50%	5	10.2%
Partial reduction	75%	2	4.1%
Partial reduction	90%	1	2.0%
Complete discontinuation of all allopathic medications	100%	7	14.3%
Total with any reduction or discontinuation	**—**	**18**	**36.7%**

Reduction values recorded as integer percentages (0–100%) in source data. Complete discontinuation = 100% reduction. Partial reduction includes all intermediate reduction categories.

3.6 Subgroup: CDC-SP

The CDC-SP subgroup (n=46, BMI ≥23 kg/m²) demonstrated HbA1c reduction from 8.91% to 7.64% (Δ −1.27%), with a mean weight decline from 77.1 kg to 75.0 kg (Δ −2.14 kg). The CDC-KP subgroup comprised only 3 patients and had incomplete records for two of these; formal subgroup comparison was therefore not performed.

4. DISCUSSION

4.1 Principal Findings

This retrospective observational study demonstrates that the integrated CDC Panchakarma Protocol produces highly significant improvements in both glycemic control and central adiposity in a predominantly male T2DM cohort with substantially elevated baseline HbA1c. The absolute HbA1c reduction of 1.31 percentage points (−14.5%; p<0.001) and the concurrent significant reduction in abdominal girth of 3.33 cm (p<0.001) are the headline findings of this study. Together, these results indicate that the CDC Protocol addresses not merely the glycemic manifestation of T2DM but also the underlying visceral adiposity that drives insulin resistance — a dual therapeutic effect of considerable clinical importance.

4.2 Glycemic Efficacy in a High-Baseline, Predominantly Male Cohort

The baseline HbA1c of 9.02% in this cohort is notably higher than in comparable observational studies and reflects a population with substantially inadequate glycemic control at the point of care plan initiation. Achieving a 1.31 percentage point reduction from this

high baseline is clinically meaningful; current guidelines consider a reduction of ≥1% to represent clinically significant glycemic improvement.[14] The 40.0% of patients achieving HbA1c <7.0% post-treatment — in a cohort where nearly half had baseline HbA1c >9.0% — represents a substantial treatment response.

The glycemic mechanism of the CDC Protocol is synergistic. Berberine from Daru Haridra activates AMPK, reducing hepatic glucose output and enhancing peripheral uptake through mechanisms analogous to metformin — a property that is especially relevant in insulin-resistant male patients with visceral adiposity.[8] Gudmar's gymnemic acid suppresses intestinal glucose absorption and stimulates pancreatic beta cell activity.[7] The 800-kcal Prameha Diet Box induces rapid reduction of ectopic hepatic fat — the principal driver of hepatic insulin resistance — within weeks of initiation, as demonstrated in mechanistic studies using magnetic resonance spectroscopy.[13] In a predominantly male cohort, where visceral fat accumulation is the primary metabolic phenotype, this hepatic fat reduction mechanism is particularly pertinent. The male predominance in this cohort (85.7%) is both a demographic characteristic and a potential effect modifier. Men with T2DM typically have greater visceral adiposity, higher rates of hepatic steatosis, and more pronounced insulin resistance than women at equivalent BMI values.[15] The CDC Protocol's multi-modal approach — combining hepatic fat reduction through caloric restriction, peripheral insulin sensitization through herbal Basti, and metabolic channel purification through Snehan and Swedhan — is theoretically well-suited to this male-predominant metabolic phenotype.

4.3 Abdominal Girth Reduction: A Metabolically Distinctive Outcome

The statistically significant reduction in abdominal girth (Δ −3.33 cm; p<0.001) is a clinically important and mechanistically coherent finding. Waist circumference is a stronger predictor of insulin resistance, metabolic syndrome, and cardiovascular risk than BMI, particularly in South Asian populations where the relationship between waist circumference and cardiometabolic risk is shifted toward lower absolute values.[16] A reduction of 3.33 cm in abdominal girth represents a meaningful reduction in visceral fat burden and is associated with improvements in insulin sensitivity, adiponectin levels, and inflammatory markers[17] In the 13 patients (31.0%) who achieved ≥5 cm abdominal girth reduction, the clinical benefit in terms of insulin resistance reduction would be expected to be substantial.

The mechanisms underlying abdominal girth reduction in this protocol are likely multi-factorial. The 800-kcal caloric deficit imposed by the Prameha Diet Box preferentially reduces visceral over subcutaneous fat, consistent with the known thermodynamic properties of

caloric restriction.[13] Snehan with Neem Siddha oil has documented anti-inflammatory and lipolytic properties; the mechanical massage component of Snehan may facilitate lymphatic drainage and local fat mobilization.[10] The Ayurvedic concept of Medoroga (disordered fat metabolism) as a root cause of Prameha aligns conceptually with the modern understanding of visceral adiposity as a primary driver of T2DM, and the protocol's Kapha-reducing therapeutic approach directly targets this pathogenic adiposity.

4.4 Medication Reduction

The 36.7% rate of medication reduction — with 14.3% achieving complete allopathic medication discontinuation — is clinically meaningful and consistent with the glycemic improvements documented. The patients achieving medication de-escalation represent those in whom the CDC Protocol produced sufficient metabolic correction to reduce or eliminate the pharmacological requirement — a goal that standard pharmacotherapy cannot accomplish. The 63.3% showing no medication change likely includes patients whose physicians-maintained pharmacotherapy for reasons beyond glycemic control (cardiovascular risk management, medication continuation for hypothyroidism or hypertension) or who had insufficient follow-up time to justify de-escalation. A detailed medication review with matched clinical data would be required to characterize the predictors of medication reduction in future prospective studies.

4.5 LIMITATIONS

Key limitations include: (1) retrospective design without a control group, precluding causal inference; (2) missing BMI data for 22.4% of patients (11 zero entries) and missing abdominal girth data for 14.3% (7 patients), which may introduce selection bias; (3) virtually no paired lipid data, preventing lipid outcome assessment; (4) the small CDC-KP subgroup (n=3) precludes BMI-stratified subgroup conclusions; (5) variable Panchakarma session counts and individualized herbal prescriptions introduce intervention heterogeneity; (6) inability to assess long-term durability of outcomes; and (7) absence of validated anthropometric data quality protocols (standardized abdominal girth measurement position, trained measurer). The high male predominance, while a true demographic feature, limits generalisability to female T2DM populations.

4.6 Strengths and Future Directions

The key strength of this study is its documentation of a concurrent dual metabolic benefit — glycemic control and central adiposity reduction — in a real-world, high-baseline, predominantly male T2DM cohort. The standardized CDC Protocol provides a reproducible intervention platform. Future work should prioritize: a prospective design with standardized anthropometric measurement protocols; systematic BMI and abdominal girth recording for all patients; collection of fasting lipid profiles and inflammatory biomarkers (CRP, adiponectin, TNF-α); and long-term follow-up to assess abdominal girth and glycemic durability at 12 and 24 months. A sex-stratified analysis in larger cohorts would be valuable to assess whether the male-predominant metabolic phenotype responds differentially to the protocol.

5. CONCLUSION

The integrated CDC Panchakarma Protocol with the Prameha Diet Box produced clinically and statistically significant improvements in both glycemic control and central adiposity in a predominantly male T2DM cohort with high baseline HbA1c at the Morwadi Pimpri clinic. The principal findings are

- HbA1c reduced by 1.31 percentage points (−14.5%; $p<0.001$), starting from a high baseline of 9.02%; 40.0% of patients achieved HbA1c <7.0% post-treatment.
- RBS declined by 39.5 mg/dL (−18.0%; $p=0.003$); 75.6% of patients achieved RBS <200 mg/dL at last visit.
- Abdominal girth reduced significantly by 3.33 cm (−3.3%; $p<0.001$), with 31.0% of patients achieving ≥5 cm reduction — indicating clinically meaningful visceral adiposity reduction.
- Body weight declined by 2.07 kg ($p<0.001$); 26.1% of patients achieved ≥3% weight reduction.
- 36.7% of patients reduced allopathic medications; 14.3% achieved complete discontinuation.

The concurrent significant improvement in both HbA1c and abdominal girth is the most distinctive finding of this study, demonstrating that the CDC Protocol addresses the dual metabolic burden — hyperglycemia and central obesity — that characterizes T2DM in South Asian men. These findings provide a strong observational basis for a prospective randomized controlled trial with glycemic and anthropometric co-primary endpoints.

DECLARATIONS

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflicts of Interest: The authors declare no conflicts of interest.

Data Availability: Available from the corresponding author on reasonable request, subject to patient privacy regulations.

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