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Reversal of Insulin Resistance and Metabolic Syndrome through an Integrative Ayurvedic Lifestyle Protocol: A Case Report

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ABSTRACT:

Insulin resistance, prediabetes, and metabolic syndrome are increasingly prevalent and often coexist with hypothyroidism and obesity. Ayurveda offers holistic, root-cause management through dietary, lifestyle, and detoxification approaches. A 43-year-old female with prediabetes, hypothyroidism, obesity (BMI 29.3), oedema, and fatigue underwent a six-month *Diabetes Free Forever (DFF)* Ayurvedic protocol integrating *Ahara*, *Vihara*, *Panchakarma* (Virechana, Basti, Jal Basti), *Langhana*, herbal formulations, yoga, and digital health monitoring. Post-intervention, her weight reduced from 75 kg to 59 kg, BMI improved to 23, and symptoms resolved. HbA1c decreased from 5.6% to 5.1%, fasting insulin from 71 to 3.88 µIU/mL, and postprandial insulin from 200 to 15.71 µIU/mL. OGTT and thyroid profile normalized, and metformin was discontinued. This case demonstrates successful reversal of insulin resistance and metabolic imbalance through an integrative Ayurvedic lifestyle approach, warranting further validation in controlled clinical studies.

KEYWORDS: Ayurveda, Insulin resistance, Prediabetes, Metabolic syndrome, Hypothyroidism, Obesity, Panchakarma, Langhana, Virechana, Basti, Gandharva Haritaki, Yoga, Lifestyle modification, Digital health, Mandāgni, Fasting insulin, Glucose tolerance, Metabolic reversal, Integrative medicine.

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INTRODUCTION:

Insulin resistance and metabolic syndrome contribute significantly to the rise in type 2 diabetes mellitus and cardiovascular disorders worldwide. India alone could see over 125 million diabetics by 2045 (IDF). Conventional management emphasizes long-term pharmacotherapy, often neglecting root causes such as impaired digestion (Mandāgni), sedentary lifestyle, and stress. Ayurveda recognizes Mandāgni as central to metabolic disorders—"Mandāgni Sarve Rogāṇāṁ Mūlaṁ"—and prescribes Langhana (fasting and detoxification) as paramount interventions. Contemporary research supports the combination of diet, fasting, herbal medicines, Panchakarma, and yoga for metabolic syndrome reversal and improved insulin sensitivity. This report illustrates the results of a structured Ayurvedic protocol in reversing insulin resistance and metabolic syndrome.

Case Presentation

Patient Profile:

- Female, 43 years
- Weight: 75 kg; Height: 160 cm (BMI 29.3 kg/m^2)
- Chief Complaints: Generalized oedema, joint pain, fatigue
- Past History: Prediabetes, hypothyroidism (Thyronorm 25 mcg), Metformin 500 mg SR
- Lifestyle: Sedentary

Baseline Clinical & Laboratory Parameters:

Parameter	Baseline Value
Fasting Plasma Glucose	105 mg/dL
Postprandial Glucose	136 mg/dL
HbA1c	5.6%
Fasting Insulin	71 µIU/mL
Postprandial Insulin	200 µIU/mL
T3	112 ng/dL
T4	8 µg/dL
TSH	5.77 µIU/mL

Intervention

The patient underwent the **DFF Protocol**, which included:

- **Ahara (Diet):** Low-glycemic, plant-based meals, herbal decoctions, intermittent fasting, seasonal fruits.
- **Vihara (Lifestyle):** Daily yoga, structured walking regimen.
- **Langhana (Fasting) & Detox:** Intermittent fasting, juice-based fasting, Panchakarma (Mild Virechana, Basti—Jal Basti).
- **Herbal Formulations:** Gandharva Haritaki, Guggul-based preparations for joint pain, shown in studies to improve metabolic outcomes.
- **Digital Support:** Teleconsultations, lifestyle tracking, ensuring intervention adherence.
- **Mind-Body Practices:** Meditation, counselling, stress management.

Results After 6 Months

Parameter	Baseline	6 Months
Weight	75 kg	59 kg
BMI	29.3	23.0
Fasting Plasma Glucose	105 mg/dL	88 mg/dL
Postprandial Glucose	136 mg/dL	110 mg/dL
HbA1c	5.6%	5.1%
Fasting Insulin	71 µIU/mL	3.88 µIU/mL
Postprandial Insulin	200 µIU/mL	15.71 µIU/mL

Recent OGTT (29 Aug 2025, 75 g glucose):

- Fasting: 80.2 mg/dL
- 1 hr: 88.4 mg/dL
- 2 hr: 93.5 mg/dL
- 3 hr: 72.8 mg/dL

Recent Thyroid Profile:

- T3: 1.08 ng/mL
- T4: 9.45 µg/dL

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- TSH: 3.59 µIU/mL

Other Clinical Outcomes:

- Oedema and joint pain: Resolved
- Energy levels: Normalized
- Medications: Metformin discontinued; Thyronorm continued

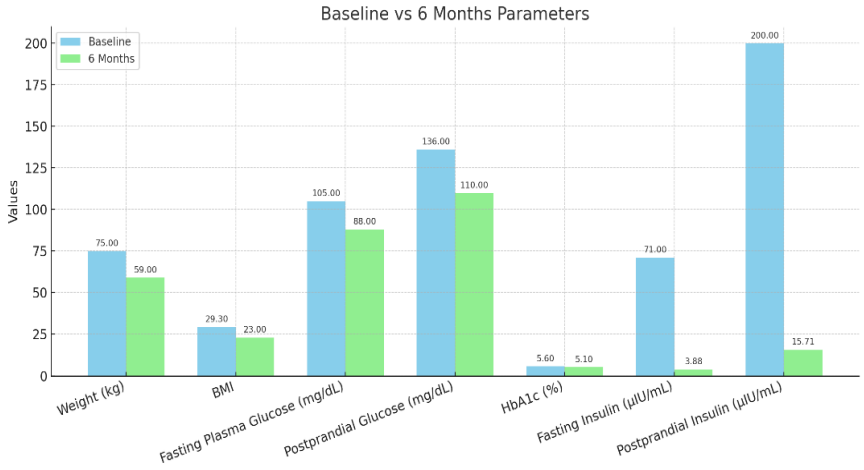

Figure: **Baseline vs 6 Months** for all parameters

DISCUSSION:

The observed reduction in fasting and postprandial serum insulin levels post-intervention is a strong indicator of improved insulin sensitivity and reversal of insulin resistance. The marked decline in fasting insulin suggests enhanced hepatic insulin sensitivity, while the significant decrease in postprandial insulin indicates improved peripheral (muscle) insulin responsiveness. These changes, combined with normalization of glycemic parameters (FPG: 105→88 mg/dL, PPG: 136→110 mg/dL, HbA1c: 5.6→5.1%) and substantial BMI reduction (29.3→23.0), reflect a comprehensive restoration of metabolic health. Normalization of thyroid profile (TSH reduced from 5.77 to 3.59 µIU/mL) indicates an improved endocrine balance, possibly due to weight loss, stress reduction, and enhanced metabolic function. Recent OGTT results confirm excellent glucose tolerance, reinforcing the reversal of insulin resistance. Such improvements may also reduce long-term cardiometabolic risk by lowering hyperinsulinemia-driven inflammatory and atherogenic pathways. These findings align with existing evidence that lifestyle-based interventions and integrative approaches can achieve significant improvements in insulin dynamics, even in individuals with severe baseline insulin resistance.

CONCLUSION:

Ayurvedic lifestyle interventions targeting Mandāgni correction and Langhana principles can safely reverse prediabetes, insulin resistance, and metabolic syndrome features. Modern clinical studies further affirm the efficacy of these integrative strategies. Larger controlled trials are essential for evidence-based adoption into standard care.

Conflict of Interest

None declared.

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