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Case Report

Management of Gestational Diabetes Mellitus through Ayurveda – A Case Report

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ABSTRACT:

Background: Gestational diabetes mellitus (GDM) is a common obstetric complication associated with significant maternal, fetal and neonatal morbidity. Conventional management includes medical nutrition therapy (MNT), oral hypoglycemic agents and insulin when required. Ayurveda conceptualizes conditions similar to GDM under *Prameha* and offers *Pathya Ahara-Vihara* and *Shamanaushadhi*. However, systematically documented clinical evidence remains limited. **Clinical Findings:** A 32-year-old primigravida was diagnosed with GDM at 26 weeks 5 days of gestation based on a 75-g oral glucose tolerance test (OGTT) interpreted according to IADPSG criteria (fasting glucose 116 mg/dL, 1-hour glucose 183 mg/dL, 2-hour glucose 119 mg/dL). She also had mild anemia (Hb 9.8 g/dL). **Intervention:** Dietary and lifestyle modification was initiated at 26 weeks 5 days of gestation. As fasting and postprandial blood glucose levels remained above target after two weeks, *Shamanaushadhi -Dhatri Loha, Vasanta Kusumakara Rasa,* and *Asanadi Kashaya* were started from 28 weeks 5 days and continued until delivery. **Outcome:** Postprandial blood glucose declined from 157 mg/dL at 28 weeks 5 days to 118 mg/dL at 40 weeks, reaching the recommended postprandial target, while fasting blood glucose remained relatively stable during follow-up. A healthy male neonate weighing 3200 g was delivered by LSCS for non-progress of labor, with APGAR scores of 7, 9, and 10 at 1, 5, and 10 minutes respectively. No neonatal complications or treatment related adverse events were observed. **Conclusion:** In this case, dietary and lifestyle modification was initiated at 26 weeks 5 days of gestation following the diagnosis of GDM, followed by *Shamanaushadhi* at 28 weeks 5 days of gestation, and continued until delivery, with follow-up to 6 weeks postpartum. Improvement in glycemic control was observed during treatment, along with favorable maternal and neonatal outcomes and no treatment-related adverse events. This case highlights the potential role of Ayurveda in the management of gestational diabetes mellitus.

KEYWORDS: *Asanadi Kashaya*, Ayurveda, case report, gestational diabetes mellitus, *Prameha*, pregnancy, *Vasanta Kusumakara Rasa*.

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1. INTRODUCTION

Gestational diabetes mellitus (GDM) is defined as carbohydrate intolerance of variable severity with onset or first recognition during the current pregnancy. [1] It is one of the most common medical complications in pregnancy, affecting an estimated 14% of pregnancies worldwide, with significantly higher prevalence reported in India, attributed to genetic predisposition, rapid urbanization, sedentary lifestyle, and changing dietary patterns. [2] GDM is associated with significant adverse outcomes for both mother and child. Maternal complications include hypertensive disorders of pregnancy, increased rate of operative delivery and elevated lifetime risk of type 2 diabetes mellitus. Fetal and neonatal complications include macrosomia, birth injury, neonatal hypoglycemia, increased risk of obesity and metabolic syndrome in later life. [3] Achieving optimal glycemic control throughout pregnancy is therefore essential to preventing these complications.

Conventional management of GDM, follows stepwise approach beginning with medical nutrition therapy, lifestyle modification and regular glucose monitoring. When glycemic targets are not achieved despite these measures, pharmacological therapy is recommended, with insulin being the preferred treatment during pregnancy. [4]

In Ayurveda, GDM can be understood within the framework of *Prameha*, classified as a *Santarpanajanya Vyadhi* (disorder arising from excessive nourishment), with its *Samprapti* (pathogenesis) rooted in the vitiation of Kapha Dosha and Meda Dhatu. [5]

In this context, the present case describes the management of GDM using a structured Ayurveda treatment protocol in a patient requiring pharmacological intervention beyond initial dietary and lifestyle modifications. The case provides detailed longitudinal documentation from diagnosis through the postpartum period, including serial glycemic monitoring, maternal and neonatal outcome assessment, and neonatal glucose monitoring. It contributes additional clinical evidence to the limited literature on the Ayurvedic management of GDM and provides a rationale for future systematic clinical evaluation.

2. CASE REPORT

A 32-year-old primigravida, an IT professional, from an upper-middle-class family in Belagavi, presented for her routine antenatal check-up at KLE Ayurveda Hospital, Belagavi, at 26 weeks 5 days of gestation on 19 March 2025. She had no active complaints and reported normal fetal movements. Her LMP was on 13 September 2024, with an EDD of 20 June 2025. She had no significant past medical or surgical history and no known drug allergies. Family history was significant - both parents were known cases of type 2 diabetes mellitus on oral hypoglycemic therapy. There was no history of alcohol, smoking or recreational drug use. Pre-pregnancy menstrual cycles were regular. She conceived spontaneously and attended regular antenatal visits. As part of routine antenatal care, she received Tablet Leptaden, *Garbhapala Rasa*, and *Phala Ghrita* during the first trimester, followed by *Dhatri Loha* and Syrup Trophogest-Fe during the second trimester. All blood investigations and ultrasonography reports were within normal limits until the current visit.

Clinical findings:

On examination, she was in fair general condition, well-built and well-nourished. Height was 5’6’’ and weight at current visit was 72 kg (pre-pregnancy weight – 67 kg). No pallor, icterus or pedal edema was noted. Vitals were stable – Blood pressure 120/80 mmHg, pulse rate 86 beats per minute. Per abdominal examination, abdomen was globular, longitudinally distended with the umbilicus central and everted. Linea nigra was present. On palpation, uterus was corresponding to 26-28 weeks with symphysis-fundal height of 26 cm. External ballottement was elicited. Fetal heart rate was 156 beats per minute and regular, on auscultation.

Table 1: Timeline of events

Date	Gestational Age	Event
13 November 2024	8 weeks 5 days	Booking visit – Confirmation of intrauterine pregnancy by Ultrasonography
12 December 2024	12 weeks 6 days	Nuchal translucency (NT) scan
12 February 2025	21 weeks 5 days	Anomaly scan
19 March 2025	26 weeks 5 days	GDM diagnosed by 75-g OGTT
19 March 2025 – 2 April 2025	26 weeks 5 days – 28 weeks 5 days	Dietary and lifestyle modification
2 April 2025	28 weeks 5 days	Follow-up: Blood glucose assessment and growth scan
2 April 2025 – 16 April 2025	28 weeks 5 days – 30 weeks 5 days	*Shamanaushadhi* initiated; dietary and lifestyle modification continued
16 April 2025	30 weeks 5 days	Follow-up
16 April 2025 – 20 June 2025	30 weeks 5 days – 40 weeks	Dietary and lifestyle modification *with Shamanaushadhi* continued; regular blood glucose monitoring
04 June 2025	37 weeks 5 days	Term scan
21 June 2025	40 weeks 1 day	Lower-segment caesarean section; delivery of a term male neonate
6 August 2025	6 weeks 4 days postpartum	Postpartum follow-up and blood glucose assessment

Diagnostic assessment: As a part of routine antenatal check-up at 26 weeks 5 days of gestation, 75-g oral glucose tolerance test (OGTT) was performed under standardized laboratory conditions using venous plasma glucose measurements. The fasting glucose 116 mg/dL, 1-hour glucose 183 mg/dL, and 2-hour glucose 119 mg/dL. GDM was diagnosed based on the International Association of Diabetes and Pregnancy Study Groups (IADPSG) criteria,[6] wherein any single value meeting or exceeding the defined threshold (fasting ≥ 92 mg/dL, 1-hour ≥ 180 mg/dL, 2-hour ≥ 153 mg/dL) is sufficient for diagnosis. In this case, both the fasting and 1-hour values independently confirmed the diagnosis. The differential diagnosis considered and the basis for confirmation and exclusion are summarized in Table 2.

Table 2: Differential Diagnosis

Differential Diagnosis	Inclusion	Exclusion/Confirmation
Overt diabetes in pregnancy	Hyperglycemia detected during pregnancy	Hyperglycemia was first detected at 26 weeks 5 days of gestation. The diagnostic 75-g OGTT did not meet the diagnostic threshold for overt diabetes in pregnancy (fasting plasma glucose ≥126 mg/dL or 2-hour plasma glucose ≥200 mg/dL). – Hence, excluded.
Gestational diabetes mellitus	Hyperglycemia first detected during at 26 weeks 5 days of gestation during routine antenatal screening.	Confirmed by a 75-g OGTT fulfilling the IADPSG diagnostic criteria for GDM.

Diagnostic Challenges: No significant diagnostic challenges were encountered. Timely antenatal screening, good patient compliance with scheduled investigations, and interpretation of the 75-g OGTT according to IADPSG criteria enabled prompt diagnosis.

Prognosis: The short-term prognosis was favorable. However, long-term postpartum surveillance of glycemic status was recommended because women with a history of GDM remain at an increased lifetime risk of developing type 2 diabetes mellitus.

3. THERAPEUTIC INTERVENTION

The management protocol was structured in two stages, as summarized in Table 3:

1. Dietary and lifestyle modifications for first two weeks following diagnosis and,
2. Addition of *Shamanaushadhi* when glycemic targets were not achieved with dietary and lifestyle modification alone.

Table 3: Management Protocol - Timeline

Date	Gestational age	Intervention
19 March 2025 – 2 April 2025	26 weeks 5 days – 28 weeks 5 days	Dietary and lifestyle modification
2 April 2025 – 20 June 2025	28 weeks 5 days – 40 weeks	Dietary and lifestyle modification with *Shamanaushadhi* 1. *Vasanta Kusumakara Rasa* (Dhoothpapeshwara-P230500020) 125 mg 1TID after food with warm water 2. *Asanadi Kashaya* (SDM Pharmacy-MAK049) 15 mL TID before food with warm water.
The patient continued *Dhatri Loha* (KLE Pharmacy - 2024019) 250 mg 2BD after food with warm water and Syrup Trophogest-Fe (Dr Palep's – PAS48) 10 mL BD after food with warm water as concomitant antenatal medications.		

Dietary advice - The patient was advised to include Barley (*Hordeum vulgare*), Green gram (*Vigna radiata*), Fenugreek (*Trigonella fornum-graecum*) and leafy green vegetables in her daily diet. Foods with high refined carbohydrate content, fried preparations, sweets, and heavy meals were restricted. Small, frequent meals were recommended to prevent postprandial glucose spike.

Lifestyle modifications - She was counselled on moderate-intensity physical activity appropriate for pregnancy, specifically structured walking for 30 minutes daily. Prolonged sedentary periods were discouraged.

4. FOLLOW-UP AND OUTCOME

Serial follow-up blood glucose measurements from 28 weeks 5 days of gestation until 6 weeks 4 days postpartum. During follow-up, postprandial blood glucose progressively declined from 157 mg/dL at 28 weeks 5 days to 118 mg/dL at 40 weeks, while fasting blood glucose remained relatively stable. At the 6 weeks 4 days postpartum follow-up, fasting and 2-hour postprandial blood glucose values were 90 mg/dL and 82 mg/dL, respectively. Serial fasting and 2-hour postprandial blood glucose measurements obtained during follow-up are summarized in Table 4 and illustrated in Figure 1.

Table 4: Serial fasting and 2-hour postprandial blood sugar levels during pregnancy and at the 6-week postpartum follow-up

Date	Gestational Age	Blood Sugar Levels	
2 April 2025	28 weeks 5 days	FBS	100 mg/dL
		PPBS	157 mg/dL
23 April 2025	31 weeks 5 days	FBS	100 mg/dL
		PPBS	138 mg/dL
14 May 2025	34 weeks 5 days	FBS	98 mg/dL
		PPBS	122 mg/dL
04 June 2025	37 weeks 5 days	FBS	101 mg/dL
		PPBS	119 mg/dL
20 June 2025	40 weeks	FBS	105 mg/dL

		PPBS	118 mg/dL
6 August 2025	6 weeks 4 days postpartum	FBS	90 mg/dL
		PPBS	82 mg/dL

(FBS = Fasting Blood Sugar; PPBS = 2-hour Postprandial Blood Sugar; RBS = Random Blood Sugar)

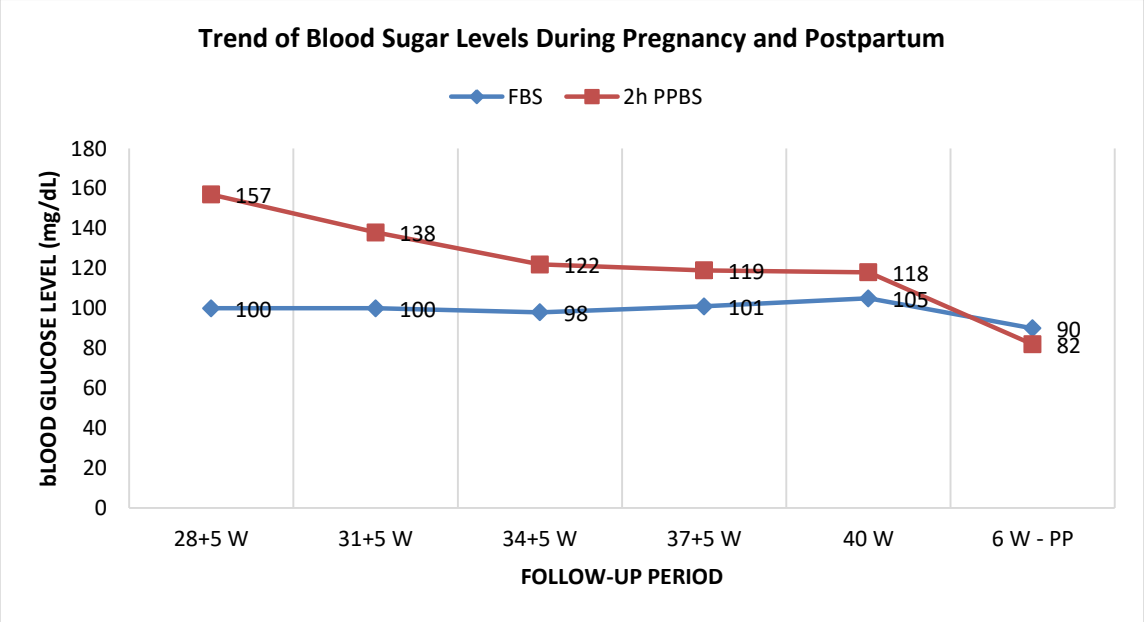

Figure 1: Serial fasting and 2-hour postprandial blood sugar levels during pregnancy and at the 6-week postpartum follow-up

Fetal growth remained appropriate for gestational age on ultrasonography performed at 28 and 37 weeks, with no evidence of macrosomia. At 40 weeks of gestation, labor was induced using a low-dose oxytocin regimen. However, due to non-progress of labor, a lower-segment caesarean section was performed at 40 weeks 1 day. A term male baby weighing 3200 g was delivered with APGAR scores of 7, 9, and 10 at 1, 5, and 10 minutes, respectively. The neonate had a normal physical examination and was breastfed within the first hour of life. Capillary blood glucose measurements obtained 30 minutes after the first feed and subsequently before feeds remained within the normal range (2 hours: 62 mg/dL; 4 hours: 68 mg/dL; 6 hours: 71 mg/dL; 12 hours: 74 mg/dL). No episode of neonatal hypoglycemia was observed. The neonate established breastfeeding successfully, required no NICU admission.

Adherence: Treatment adherence was assessed during scheduled antenatal follow-up visits through verbal confirmation regarding medication intake and adherence to the prescribed dietary and lifestyle modifications, together with review of blood glucose monitoring logs.

Tolerance: Tolerability was assessed at each follow-up visit through clinical evaluation, general and obstetric examination, routine antenatal investigations, and maternal and fetal assessments. Any new symptoms or treatment-related adverse events were documented throughout the treatment period.

Adverse effects: No treatment-related maternal, fetal, or neonatal adverse or unanticipated events were observed during the treatment period.

5. DISCUSSION

According to Ayurveda, pregnancy is considered a *Santarpana Avastha* (physiological anabolic state). When combined with excessive intake of sweet foods and a sedentary lifestyle, pathological aggravation of *Kapha* and *Meda* leads to impaired metabolic function, accumulation of Ama, and obstruction of the *Rasavaha* and *Medovaha Srotas*, conceptually corresponding to insulin resistance and impaired peripheral glucose utilization in GDM. The second

trimester corresponds to *Pitta Kala* in embryonic-development, a phase of increased metabolic activity associated with *Mamsa–Shonita Upachaya* (active fetal muscle and blood tissue formation), during which these pathological changes become clinically evident, paralleling the typical diagnosis of GDM between 24 and 28 weeks of gestation when placental insulin-antagonistic hormone levels peak. As *Shodhana* is contraindicated during pregnancy, management is directed towards *Pathya Ahara-Vihara* and *Shamanaushadhi*.

Gestational Diabetes Mellitus develops when pancreatic beta-cell reserve fails to compensate for the progressive physiological insulin resistance driven by placental hormones during second and third trimesters. [3] The present case had multiple recognized risk factors including maternal age >30 years, family history of type 2 diabetes mellitus, sedentary occupation and urban dietary pattern.

GDM was diagnosed using the IADPSG-recommended 75-g oral glucose tolerance test (OGTT), and glycemic control was monitored with serial fasting and postprandial blood glucose measurements, the recommended methods for diagnosis and follow-up during pregnancy.[6] HbA1c was not assessed because physiological changes during pregnancy, particularly increased red blood cell turnover, limit its accuracy in reflecting glycemic status.[7]

Dietary and lifestyle modification is the first-line management of GDM.[4] The prescribed diet was based on the principles of *Prameha Chikitsa* [8] with *Hordeum vulgare* [9] and *Trigonella foenum-graecum* [10] supported by evidence for improving glycemic control, while restriction of refined carbohydrates and small frequent meals aligns with low glycemic dietary recommendations. Daily 30-minute moderate walking, as recommended by the ADA, improves insulin sensitivity. [11] After two weeks, fasting and postprandial blood glucose levels remained elevated, necessitating the addition of *Shamanaushadhi* as described in Table 3.

Vasanta Kusumakara Rasa was selected for its *Rasayana* properties and its specific indication for *Prameha*. [14] Its selection was considered appropriate in gestational diabetes mellitus, where management focuses on achieving glycemic control while supporting maternal and fetal well-being. Gestational diabetes mellitus is characterized by hyperglycemia accompanied by increased oxidative stress, low-grade inflammation, and immune dysregulation, all of which contribute to insulin resistance. The antioxidant, immunomodulatory, and metabolic regulatory properties of *Vasanta Kusumakara Rasa* provide a mechanistic basis for its therapeutic use in this context. [15] In particular, *Swarna Bhasma* has been shown to inhibit NF-κB-mediated inflammatory signaling under hyperglycemic conditions, suggesting a potential role in modulating inflammation-associated insulin resistance. [16]

Asanadi Kashaya was prescribed based on its indication in *Prameha* and *Medodosha*, acting through *Agnivardhana* and *Srotoshodhana*. Its principal constituent *Asana (Pterocarpus marsupium)* demonstrates significant alpha-glucosidase inhibitory activity, directly attenuating postprandial glucose absorption, alongside beta-cell regenerative potential - a mechanism distinct from conventional antidiabetic agents. [17] Its constituents additionally address insulin resistance through PPAR-γ mediated glucose transport and suppression of inflammatory mediators. [18] Administration as aqueous decoction ensures optimal bioavailability of these water-soluble phytoconstituents.

Following an inadequate response to dietary and lifestyle modifications, *Shamanaushadi* were initiated. Subsequently, postprandial blood glucose declined from 157 mg/dL at 28 weeks 5 days to 118 mg/dL at 40 weeks, achieving the recommended postprandial target. Fasting blood glucose showed only a modest reduction but remained stable throughout pregnancy despite the presence of multiple recognized risk factors, as illustrated in Figure 1. At the 6 weeks 4 days postpartum follow-up, fasting and 2-hour postprandial blood glucose values were 90 mg/dL and 82 mg/dL, respectively, suggesting continued glycemic improvement after delivery.

Fetal growth remained appropriate throughout pregnancy, with no evidence of macrosomia, and the pregnancy resulted in the delivery of a term male neonate weighing 3200 g with satisfactory APGAR scores and no neonatal complications, including hypoglycemia or the need for NICU admission. Thus, the clinical relevance of this case lies not merely in the numerical reduction in blood glucose levels, but in preventing deterioration of glycemic control and achieving favorable maternal and neonatal outcomes.

Limitations: This single-case report precludes causal inference and limits the generalizability of the findings. HbA1c was not assessed, the postpartum follow-up was relatively short, and the high cost of *Vasanta Kusumakara Rasa* may limit its wider clinical applicability.

6. CONCLUSION

Gestational Diabetes Mellitus was diagnosed at 26 weeks 5 days of gestation. The patient was managed over approximately 13 weeks 3 days including an initial two weeks of dietary and lifestyle modification followed by approximately 11 weeks 2 days of *Shamanaushadhi* - *Vasanta Kusumakara Rasa* and *Asanadi Kashaya* until delivery, with a final assessment at 6 weeks 4 days postpartum. No treatment related adverse effects were reported, and the patient remained compliant throughout the treatment period. During follow up, postprandial blood glucose levels progressively declined from 157 mg/dL at 28 weeks 5 days to 118 mg/dL at term, and fasting blood sugar remained relatively stable. A term male neonate weighing 3200 g was delivered with excellent APGAR scores, with no episode of neonatal hypoglycemia or other neonatal complications.

Declaration of Patient Consent – The authors confirm that they have acquired a patient consent form, in which the patient or caregiver has granted permission for the publication of the case, including accompanying images and other clinical details, in the journal. The patient or caregiver acknowledges that their name and initials will not be disclosed, and sincere attempts will be undertaken to safeguard their identity. However, complete anonymity cannot be assured.

Patient's Perspective- The patient reported that she was anxious upon receiving the diagnosis of GDM, particularly given her family history of diabetes. She found the dietary and lifestyle guidance practical and manageable within her daily routine. She remained compliant with all prescribed medications, reported no side effects, and expressed relief and satisfaction at achieving a healthy pregnancy outcome

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