

# Complicated Gestational Diabetes: A Challenge!

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## Abstract

Gestational diabetes is a condition caused by insulin resistance and multiple metabolic abnormalities; the prevalence of gestational diabetes mellitus (GDM) has been rising and has almost become parallel to obesity and type 2 diabetes. However, the mechanism and treatment points are still debatable. Hyperglycemia in pregnancy (HIP) is social instability as woman infertility is associated with it. If timely screened and achieved targeted glycemic control, it gives the desired outcome of pregnancy especially in pregestational diabetes. Support of family and thorough understanding of the disease is crucial in such situations as it requires multidisciplinary management, for example, structured self monitoring blood glucose (SMBG), diet and nutrition, multiple daily insulin injections with dose adjustment, avoiding hypoglycemia, and mental stability.

Hyperglycemia in pregnancy (HIP) as a whole (pregestational and gestational diabetes) is one of the leading causes of woman infertility, miscarriages, abortions, fetal complications and anomalies<sup>3</sup> Diabetes in pregnancy is challenging task for health care professionals, as the opinion on diagnosis differ and the treatment options are limited. Main stream of treatment roam around insulin with lifestyle modification and metformin<sup>4,5</sup> (a dilemma for the doctors). It requires more attention and discipline than usual, as it involves two lives and more emotions attached to it.

Apart from health, women have to face social instability (e.g., lack of family support, family conflict, violence, and blaming a woman), once detected with GDM, making them feel isolated and unlucky for the family. This poor attitude leads to worsening mental health in the females who are already exposed to anxiety and depression. In addition, gestational diabetes is an economic burden to the common earning man, as the overall cost of the disease is high. In this case, in spite of investing a huge amount of money, the woman has to undergo multiple traumas. Therefore, management of such cases is crucial.

One such case is of a 34-year-old woman detected with typical symptoms of type II diabetes since 6.5 years. She was on oral hypoglycemic agents (OHAs) for a long time. Her grandfather and father had a history of type II diabetes. At the time of diagnosis, her HbA1c was 10.8% without ketosis.

She belongs to Chanasma, a rural area in Mehsana district in North Gujarat. She is well educated and working as an officer (Patwari) in the government sector. After tying a knot at the age of 23 years, she had history of multiple abortions (7 reported) culprit being hyperglycemia. In year 2017, on her 7th gestational week she was referred to Arogyam Health Care—Diabetes Clinic.

## Keywords

- ▶ hyperglycemia in pregnancy
- ▶ HIP
- ▶ self-monitoring blood glucose and nutrition
- ▶ social burden

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### At Arogyam Health Care

Anthropometric data were collected and detailed history was taken on the first visit—weight 65 kg; BMI 28.1; laboratory investigations: HbA1C 9.1%, RBS 234 mg/dL); lipid profile: TG 189 mg/dL, LDL165 mg/dL, C-peptide 3.04; thyroid (TSH) 2.86 IU/mL; hemoglobin 9.9 g/dL; urine examination shows presence of sugar ++; and S.creatinine 0.8 mg/dL. Antibodies test was done to rule out other type of diabetes (GAD antibodies [glutamic acid decarboxylase] value was 3 units/mL which suggests it was normal).

Her prescription included premix insulin with metformin 500 thrice a day.

Flash glucose monitoring was advised intermittently and targets were set, FBS to be less than 95 mg/dL and PPBS to be less than 120 mg/dL. Along with strict SMBG four times a day with pre and post meals.<sup>5,6</sup>

Prescription was change to basal bolus regimen.<sup>5</sup>

Diabetes educator and nutritionist counseled her on gestational diabetes and the importance of diet, insulin technique, hypoglycemia, and correction dose.

The diet part was tackled with utmost care, as the woman is eating for two. The calories intake during first trimester was set to 1,500 kcal, as the nutritional need during this period does not increase. For second and third trimesters the calorie intake was 2,600 kcal and 2900 kcal, respectively. In addition, her diet was modified according to her hyperglycemic condition, keeping in mind her nutritional status, which should not be hampered. For breakfast, she was advised to add complex carbohydrates with more fibers and protein, for example, *moong-moth* (pulses), *khakra*, and added fruits and nuts. Her lunch included multigrain roti (whole wheat flour, rolled oats, and millet flour in equal proportion) and a small bowl of green leafy vegetable (*sabzi*) and daal. Jaggery and sugar, common Gujarati ingredients, were removed completely. A small bowl of salad was added (cucumber and tomatoes.) Rice was removed from her diet and her dinner included

sprouts/oats *khichdi* or *khichdi* with one part of brown rice, along with curd or buttermilk. Enough amounts of fat and protein were added in form of *paneer*, tofu, and cheese and protein powder. Seeds rich in omega 3 fatty acid were added—chia seeds, pumpkin seeds, sunflower seeds, and flax seeds. Her snacks included a handful of peanuts and roasted chickpeas. Before going to bed, she was advised to take a cup of milk without sugar to avoid hypoglycemia. She was advised to avoid social treats and eating out (familiar and unfamiliar food) and emphasis was given to repeat simple meals.<sup>7</sup> Few cheat days' food was coped up by correction doses.<sup>5</sup>

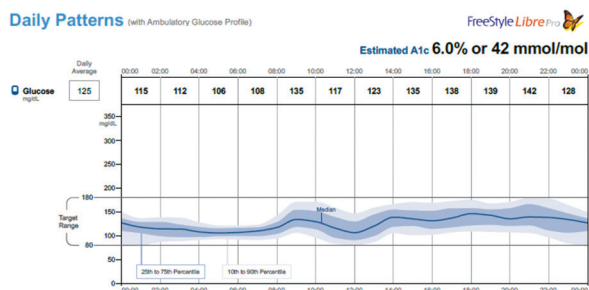
Follow-up was scheduled every 2 months. A constant contact with patient was maintained through mobile application and phone calls, when needed. Dose was titrated accordingly.

Her husband and family members played a supportive role throughout her pregnancy. Her mother-in-law was worried as she thought this might be infertility because of diabetes. She was supportive and took care of her diet part at her best. Her husband was very concerned and accompanied her during her follow-up visits at the clinic. In addition, he played a role of a mediator between her and a doctor, by sending the SMBG data punctually and titrating the dose as suggested by the doctor<sup>5,8</sup> (► **Table 1**).

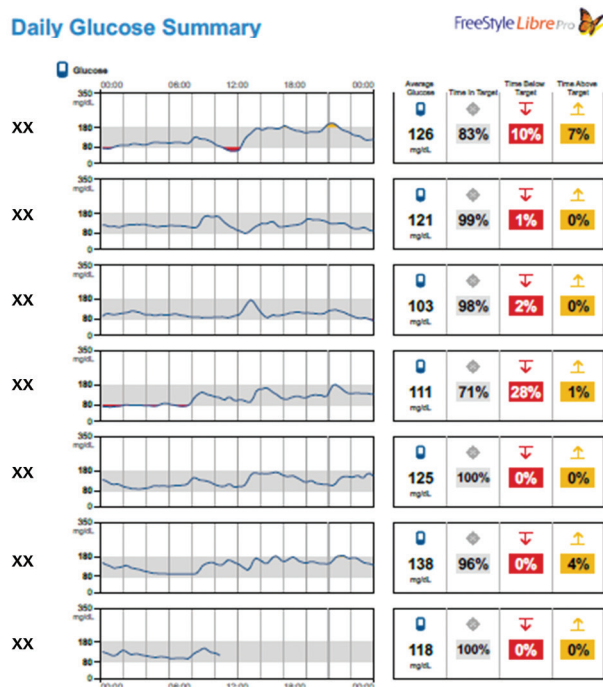
On November 25, 2018, with well-controlled glucose level she delivered a male baby at LadyCare Hospital, Ahmedabad, weighing 2.61 kg, length 49 cm, and head circumference 33 cm. APGAR score was 8. The baby developed physiological jaundice, which did not require phototherapy, as reported by the pediatrician. No other medical complications were observed. The AGP report of the patient (► **Fig. 1**)

**Table 1** Change in average blood glucose level during gestational period

Date (2018)	March 29	June 19	August 27	November 6
HbA1C %	9.1	7.1	6.2	6.6



**Fig. 1** Graphical representation of daily glucose variations through ambulatory glucose profile.



**Fig. 2** Seven days ambulatory glucose profile, showing average glucose value of the day, frequency of hyperglycemia and hypoglycemia in a day and time in range.

shows flat median line with narrow thickness, which suggests that the glycemic variability is less with average glucose profile 6% and 5.3%.

## Conclusion

Early diagnosis can help to reduce the rate of infertility and certain fetal anomalies.<sup>3</sup> Following diagnosis, the condition can be safely dealt by continuous glycemic monitoring, lifestyle changes, nutritional counseling, and appropriate use of insulin/medicines. Extensive glucose monitoring is the best tool to treat such challenging case, as it acts like a window through which physician could observe and respond to the daily influences on blood glucose.<sup>5,8</sup> In addition, emerging technology such as Ambulatory Glucose Monitoring is one of the great boons to patients as well as to the diabetologists as it helps in management of diabetes.

### Conflict of Interest

None declared.

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