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Case Report

The Challenge of Recurrent Gestational Diabetes in a Great-Grand Multiparity: A Case Report and Literature Review

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Abstract

Background: Gestational Diabetes Mellitus (GDM) is associated with a high risk of recurrence, particularly in women of advanced maternal age and high parity. Evidence on the prevention of recurrent GDM in the setting of great-grand multiparity remains limited.

Case Presentation: We report the obstetric history and management of a 42-year-old great-grand multiparous woman (para 10) in whom recurrence of GDM was successfully interrupted during her eighth pregnancy. This case details the tailored management strategies adopted in a clinical context characterized by advanced maternal age and extremely high parity, a condition that is rare in Northeast Italy.

Management and Results: Despite the patient's high-risk profile, this case underscores that recurrence of GDM may be interrupted through targeted preconception and gestational interventions. These include weight reduction, restoration of pre-pregnancy BMI, and adherence to Institute of Medicine 2009 recommended Gestational Weight Gain (GWG) guidelines. This may occur even in high-risk contexts such as advanced maternal age and great-grand multiparity. Multidisciplinary care and individualized counselling remain essential. These approaches support behavioral and metabolic optimization before and during pregnancy.

Conclusions: This case highlights that great-grand multiparity, although uncommon, should not be inherently discouraged. With careful metabolic optimization and personalized lifestyle interventions, recurrence of GDM may be successfully prevented even in highly complex obstetric scenarios. The experience described may provide practical insights for clinicians managing similarly high-risk pregnancies.

Keywords: Gestational Diabetes Mellitus (GDM); Lifestyle preventive strategies; Great-grand multiparity; Body Mass Index (BMI); Gestational Weight Gain (GWG)

Introduction

Gestational Diabetes Mellitus (GDM) is a condition characterized by carbohydrate intolerance that develops during pregnancy [1]. It is estimated that 6% to 9% of pregnancies are complicated by diabetes, with approximately 90% of these cases attributed to GDM [1]. The prevalence of GDM is higher among Hispanic, African American, Native

American, and Asian or Pacific Islander women [2]. In Europe, the estimated prevalence of GDM is 10.9% [3], and in Italy, it reached approximately 15% during the COVID-19 pandemic [4].

In high-parity populations, crude GDM prevalence appears higher, but this effect often disappears after adjusting for maternal age and family history. In a Saudi study of 633 women, half great-grand multiparas (para ≥ 10), the crude GDM rate was 8.3 times higher than in nulliparas; after adjusting for age and prior abortion, nulliparas were actually 2.95 times more likely to develop GDM, with risk rising from 2% at age 20 to 21% at 40 [5].

Grand multiparity (≥ 7 births; FIGO: 5–9, ≥ 10 as great-grand) is linked to obstetric risks like GDM and hypertension [6,7], though some studies find lower rates after controlling for confounders [8]. Great-grand multiparity is extremely rare in high-income countries, under 1% of births and scarcely reported in Italy, where fertility is low and data on ≥ 10 births are lacking [9,10].

Thus, GDM patterns in great-grand multiparas remain largely unexplored and understudied, highlighting the challenge of recurrent gestational diabetes in this population. This case report describes the obstetric history that successfully interrupted GDM recurrence during the eighth pregnancy of a 42-year-old great-grand multiparous woman (para 10).

Great-grand multiparous history

This case report was conducted in accordance with the ethical principles of the 1964 Declaration of Helsinki and its subsequent amendments. Ethical approval was obtained from the Institutional Review Board of Abano Polyclinic (Protocol No. 14; approved August 24, 2025). Written informed consent was obtained from the patient for publication of this case report.

A 42-year-old Caucasian woman at 38 weeks of gestation was admitted to the maternity ward of Abano Polyclinic (Abano Terme, Italy) for planned induction of labor due to suspected fetal macrosomia in the context of insulin-treated GDM [11]. She had been followed since the first trimester at the Obstetrics and Gynecology Outpatient Clinic of the same institution. The patient's medical history was unremarkable for chronic diseases, prior hospitalizations, or significant comorbidities. Family history was notable only for type 2 diabetes mellitus in her maternal grandmother. She denied hereditary or metabolic disorders in other relatives. Her obstetric history was significant for grand multiparity (gravida 10, para 9). All nine previous pregnancies resulted in term vaginal deliveries without maternal or neonatal complications. Recurrent GDM occurred in all pregnancies except the first and the eighth. The interpregnancy interval between the second and eighth pregnancies was 14 years (Table 1).

In the current pregnancy, relevant risk factors included advanced maternal age, great-grand multiparity, pre-pregnancy obesity (Body Mass Index [BMI] 33.65 kg/m^2; WHO Class I obesity) [13], and excessive GWG (+12 kg) [14], in the context of recurrent GDM. Initial management consisted of dietary therapy; however, due to inadequate glycemic control, insulin therapy was initiated (16 IU administered in the evening), achieving satisfactory metabolic control. Given the high-risk nature of the pregnancy, the patient attended bi-monthly obstetric follow-up visits and periodic evaluations by a diabetologist. At 38 weeks of gestation, labor was induced with prostaglandins. The patient subsequently achieved a spontaneous vaginal delivery. A female neonate weighing 3,960 g (93rd percentile for gestational age) was delivered with an Apgar score of 10 at 1 and 5 minutes. No neonatal resuscitation was required. The postpartum course was uneventful, and both mother and infant were discharged on postpartum day two. The newborn was

Table 1: Obstetric history of the patient.

Variable	2007	2008	2010	2011	2013	2015	2016	2021	2023	2025
Pre-pregnancy weight (kg)	64	84	85	85	85	85	85	70	72.5	84
Pre-pregnancy BMI	25.6	33.7	34.1	34.1	34.1	34.1	34.1	28	28.8	33.7
OGTT	Negative	Positive	Positive	Positive	Positive	Positive	Positive	Negative	Positive	Positive
GWG (kg)	16	12	11	11	11	11	11	7	13.5	12
Gestational age (weeks)	37	38	39	40	38+1	39	37+2	40	38	38
Insulin therapy	–	–	–	–	–	–	–	+	–	+
Comorbidities	Hypertension	–	–	Hypertension	Hypertension	–	–	Hypertension	–	Hypertension
Neonatal weight (g)	2,935	3,865	4,000	4,060	4,040	3,340	3,240	4,040	4,020	3,960
Percentile	48	95	93	92	97	60	75	89	97	93
Sex (M/F)	F	F	M	M	M	F	F	M	M	F

BMI: Body Mass Index; OGTT: Oral Glucose Tolerance Test; GWG: Gestational Weight Gain.
1. According to Bertino et al. 2010 [12].

exclusively breastfed. At six weeks postpartum, a 75-g Oral Glucose Tolerance Test (OGTT) [15] was performed, (fasting glucose 73 mg/dL; 2-hour glucose 106 mg/dL), consistent with resolution of gestational diabetes.

Review of previous pregnancies revealed that, in the two pregnancies without GDM (first and eighth), pre-pregnancy BMI values were 25.64 kg/m^2 (66 kg, height 158 cm) and 28.04 kg/m^2 (70 kg, height 158 cm), respectively, both within the overweight category. During the eighth pregnancy, GWG was +7 kg, consistent with the 2009 Institute of Medicine recommendations for women with pre-pregnancy overweight (7.0–11.5 kg). Notably, this GWG occurred after a 15-kg pre-pregnancy weight reduction (about 20%) compared with the weight recorded at the end of the previous pregnancy. That pregnancy culminated in a term vaginal delivery at 40 weeks of gestation of a healthy male neonate weighing 4,040 g (89th percentile), with normal Apgar scores and no evidence of neonatal hypoglycemia or metabolic complications. The postpartum course was uncomplicated, and the neonate was discharged on day two, exclusively breastfed.

Discussion

Focusing on the interrupted recurrence of GDM during the eighth pregnancy of a 42-year-old great-grand multiparous woman (para 10), we observed that although great-grand multiparity is extremely rare in Northeast Italy [10,11], it should not necessarily be discouraged, provided that GDM recurrence can be effectively prevented through preconception weight reduction, restoration of pre-pregnancy BMI, and tailored dietary and lifestyle interventions aimed at achieving appropriate GWG. As obstetric care continues to evolve, this report provides practical insights for healthcare professionals managing the delicate metabolic and behavioral balance characteristic of women at high risk of recurrent GDM.

In this scenario, a study by LeBlanc et al. demonstrated that a downward shift in BMI category (from obese to overweight or from overweight to normal weight) significantly reduced the odds of GDM recurrence by 97% [16], highlighting the impact of even modest preconception weight reduction. These findings reinforce the concept that GDM is highly modifiable through lifestyle interventions rather than being determined solely by non-modifiable factors such as maternal age or parity. Similarly, the trial conducted by Phelan et al. reported that achieving a ≥ 5% reduction in body weight before conception was associated with an 82% reduction in the odds of GDM recurrence [17].

Within the context of this unique great-grand multiparity case, we provide insights into the clinical management strategies associated with the interruption of GDM recurrence. The eighth pregnancy was preceded by preconception lifestyle modifications aimed at reducing body weight, including balanced nutrition and regular physical activity through a structured program of endurance cycling and individualized caloric control tailored to an overweight woman. In addition, during pregnancy, the patient adhered to the 2009 IOM recommendations for gestational weight gain [14].

This is relevant, considering that maternal age and parity are non-modifiable risk factors, the interruption of GDM recurrence in this late, high-risk pregnancy may have been influenced by pre-pregnancy individualized counselling, behavioral support, and careful monitoring of GWG [16,17]. A multidisciplinary approach involving obstetricians, dietitians, and other healthcare professionals may further support maternal efforts to reduce the risk of recurrence in multiparous women with obesity. A multidisciplinary approach, engaging obstetricians, dietitians, and other healthcare professionals, can further strengthen maternal efforts to prevent GDM recurrence in multiparous with excess weight. Given that obesity is a chronic condition, achieving a healthy weight before conception and preventing excessive GWG remain key strategies for reducing adverse feto-maternal outcomes [18].

Motivations for weight loss among women of childbearing age are multifactorial, encompassing health, fertility, body image, and psychological well-being, and warrant further exploration to inform effective counselling strategies. Addressing these complex issues requires coordinated efforts across nutrition, healthcare, and education, alongside policies that consider the economic, social, and cultural factors influencing family planning. While social norms and access to weight-loss or cosmetic interventions may promote thinness ideals, they may also encourage restrictive diets or unhealthy lifestyle practices before and during pregnancy [19]. Moreover, greater attention to postpartum maternal well-being is needed to optimize long-term maternal health outcomes [20].

This study has several limitations. Its generalizability is limited by the single-case observational design involving a great-grand multiparous woman from Northeast Italy, a socially and economically advantaged region. Furthermore, obstetric risks may be influenced not only by high parity but also by advanced maternal age, which should be considered a potential confounder when interpreting maternal and neonatal outcomes in great-grand multiparous women [21]. Further research is warranted to clarify whether the interruption of GDM recurrence observed in this case was incidental or related to individual behavioral, psychosocial, or motivational factors among women at risk of GDM.

Conclusion

This case highlights that the recurrence of GDM may be prevented through targeted preconception and gestational interventions, including weight reduction, restoration of a normal pre-pregnancy BMI, and adherence to the 2009 IOM recommendations for GWG, even in high-risk contexts such as advanced maternal age and great-grand multiparity. Multidisciplinary care and individualized counselling appear essential to support behavioral and metabolic optimization before and during pregnancy. Further studies are needed to confirm these findings in larger populations.

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Ethical Considerations

Written informed consent was obtained from the patient for the publication of the clinical details of this case report, and all necessary steps to ensure patient privacy and rights were fully observed.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Data Availability Statement

Data are contained within the article.

Author Contributions

Conceptualization, V.Z.; L.S. methodology; B.Z. writing-review and editing; F.V. and R.M supervision, and G.S. provided conceptualization. All authors have read and agreed to the published version of the manuscript.

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