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ORIGINAL ARTICLE

Gestational diabetes mellitus: Glycemic control during pregnancy and neonatal outcomes of twin and singleton pregnancies☆

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KEYWORDS
Twin pregnancies;
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Abstract
Objective: To assess the impact of glycemic control in gestational on neonatal weight and metabolic complications of twin and singleton pregnancies.
Methods: An observational, retrospective study to monitor 120 twin and 240 singleton pregnancies in women with GDM. Maternal glycemic parameters during pregnancy (oral glucose tolerance test results, treatment, insulinization rate, mean HbA1c in the third trimester), and neonatal complications and weight were recorded.
Results: A higher infant birth weight ratio (IBWR 1.02 ± 0.12 vs. 0.88 ± 0.12, $p < 0.001$) and a lower rate of newborns small for gestational age (severe SGA 2.5% vs. 8.3%, $p = 0.012$) were seen after singleton pregnancies as compared to twin pregnancies. The rates of newborns large for gestational age (LGA 12.6% vs. 12.5%, $p = 0.989$); macrosomic (6.7% vs. 7.5%, $p = 0.777$); or small for gestational age (SGA 6.7% vs. 10.8%, $p = 0.175$) were similar in both groups. Neonates from twin pregnancies had a higher risk of hypoglycemia (adjusted OR 4.71; 1.38–16.07, $p = 0.013$) and polycythemia (adjusted OR 10.05; 1.82–55.42, $p = 0.008$). A linear relationship was seen between third trimester HbA1c levels and IBWR in singleton (r = .199, $p = 0.003$), but not in twin pregnancies (r = 0.049, $p = 0.610$).
Conclusions: Risk of severe SGA, hypoglycemia, and polycythemia was significantly higher in twin pregnancies of women with GDM. Neonatal weight outcomes and metabolic complications in twin pregnancies of women with GDM were not related to glycemic control. Moreover, in our

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study population, fasting glucose at diagnosis and mean HbA1c in the third trimester showed a linear relationship with higher birth weights in singleton, but not in twin pregnancies.

PALABRAS CLAVE
Embarazos gemelares;
Diabetes mellitus gestacional;
Pequeño para la edad gestacional

Diabetes mellitus gestacional: control glucémico durante el embarazo y su relación con los resultados neonatales en embarazos gemelares y de feto único

Resumen
Objetivo: Evaluar el impacto del control glucémico de la diabetes mellitus gestacional (DMG) en el peso y las complicaciones de origen metabólico neonatales de embarazos gemelares y de feto único.
Métodos: Estudio observacional retrospectivo que incluyó gestantes con DMG: 120 embarazos gemelares y 240 embarazos de feto único como controles. Registramos los parámetros de control glucémico durante el embarazo (resultados de la sobrecarga oral de glucosa diagnóstica, tratamiento, insulinización, HbA1c media del tercer trimestre), las complicaciones neonatales y el peso neonatal.
Resultados: Los neonatos de embarazos únicos tuvieron mayor índice ponderal fetal (IPF 1,02 ± 0,12 vs. 0,88 ± 0.12, p < 0,001) y menor incidencia de pequeños para la edad gestacional grave (2,5% vs. 8,3%, p = 0.012). La tasa de neonatos grandes para edad gestacional, macrosómicos y pequeños para la edad gestacional fue similar en ambos grupos. Los recién nacidos de embarazos gemelares tuvieron un mayor riesgo de hipoglucemia: OR ajustada 4,71 (1,38–16,07, p = 0,013) y poliglobulia: OR ajustada 10,05 (1,82-55,42, p = 0,008). El IPF se correlacionó con la glucosa basal en la sobrecarga oral de glucosa al diagnóstico (r = 0,223, p = 0,001) y la HbA1c media del tercer trimestre (r = 0,199, p = 0,003) en los embarazos únicos, pero no en los gemelares (r = 0,003, p = 0,748; r = 0,049, p = 0,610; respectivamente).
Conclusiones: El riesgo de pequeño para la edad gestacional grave, hipoglucemia y poliglobulia fue mayor en los embarazos gemelares con DMG. Los resultados de peso neonatal y las complicaciones de origen metabólico no se relacionan con el control metabólico materno en los embarazos gemelares.

Introduction

In Spain, a diagnosis of gestational diabetes mellitus (GDM) is established in 8.8% of all pregnancies. Depending on the diagnostic criteria used, the prevalence may be even higher in other geographical settings.[1,2]

Multiple deliveries account for approximately 2% of all births in Spain,[3,4] with an increasing trend in recent decades due to an older maternal age and the increasing use of fertility treatments. The incidence of twin births increased 76% between 1980 and 2009 in developed countries.[5] Neonates from multiple pregnancies involving the use of assisted reproduction techniques account for between 14.7 and 29.0% of all infants born of multiple pregnancies, depending on the country.[6] Gestational diabetes mellitus and multiple pregnancies achieved through fertility treatments share a number of risk factors (older maternal age, overweight and obesity), multiplying the probability that both conditions may coexist. In addition, twin pregnancies pose an increased risk of neonatal complications,[7] as well as of gestational hypertension, compared with singleton pregnancies.[8]

Gestational diabetes mellitus in singleton pregnancies is associated with an increased risk of macrosomia, infants large for gestational age (LGA), and neonatal complications of metabolic origin, including hypocalcemia, hypoglycemia, polyglobulia and hyperbilirubinemia. However, there is controversy regarding the impact of GDM in multiple pregnancies. Some studies have found an increased risk of LGA,[9] macrosomia[4,10] and asymmetrical fetal growth,[11] while others have observed no differences.[12,13] On the other hand, there appears to be consistent evidence that GDM exerts a ''protective effect'', reducing the risk of infants small for gestational age (SGA) and severe fetal growth restriction.[4,11,14,15]

A number of authors have proposed a differential impact of GDM upon twin pregnancies as compared to singleton pregnancies. Population-based studies have found a lesser increase in the risk of preterm delivery and macrosomia, and a decrease in the risk of low Apgar scores at 5 min and of neonatal death in twin pregnancies, suggesting a milder impact of GDM in such situations.[9,10] It has even been reported that blood glucose control during pregnancy does not influence neonatal weight in twin pregnancies with GDM,[12] in contrast to what has been extensively demonstrated in singleton pregnancies with GDM.[16]