



ORIGINAL ARTICLE

Postpartum metabolic control in a cohort of women with type 1 diabetes



Carmen Quirós^{a,*}, Ioana Patrascioiu^a, Verónica Perea^a, Jordi Bellart^b,
Ignacio Conget^a, Irene Vinagre^a

^a Diabetes Unit, Endocrinology and Nutrition Service, Hospital Clínic i Universitari de Barcelona, Spain

^b Obstetric Unit, Hospital Clínic i Universitari de Barcelona, Spain

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KEYWORDS

Type 1 diabetes mellitus;
Postpartum period;
Body weight

Abstract

Background and objective: Pregnancy in women with type 1 diabetes (T1D) involves greater risks as compared to non-diabetic women, but less information is available about blood glucose and weight control after delivery. Our aim was to evaluate the postpartum metabolic profile (blood glucose and weight control) of women with T1D and the factors related to those metabolic outcomes.

Methods: A retrospective, observational study of 36 women with T1D during pregnancy and for up to one year after delivery.

Results: Fifty percent of patients attended a preconceptional planning program (PPP), and 44.4% of women were treated with continuous subcutaneous insulin infusion. Mean preconceptional HbA1c and body mass index (BMI) were $7.2 \pm 1.2\%$ and 23.8 ± 5.0 respectively. In the total cohort, blood glucose control significantly worsened one year after delivery (HbA1c: 7.2 ± 1.2 vs $7.6 \pm 1.2\%$, $P < 0.001$). Lower preconceptional HbA1c values were found in patients who attended PPP (6.6 ± 0.5 vs. $7.8 \pm 1.4\%$; $P = 0.02$), and were maintained for one year after delivery. No differences were found in body mass index (BMI) from the pregestational period to one year after delivery in any of two groups (No PPP 22.5 ± 4.6 vs 23.2 ± 4.8 , $P = 0.078$; PPP 25.4 ± 3.4 vs 25.5 ± 3.4 kg/m², $P = 0.947$). Preconceptional HbA1c was shown to be the most important determinant of metabolic control ($\beta = 0.962$, $p < 0.001$) and weight one year after delivery ($\beta = 0.524$, $p = 0.025$) and weight gain during pregnancy ($\beta = 0.633$, $p = 0.004$).

Conclusions: Pregnant women with T1D return to prepregnancy body weight one year after delivery, especially those with lower HbA1c levels and BMI before pregnancy. However, blood glucose control deteriorates after delivery, suggesting the need for changes in clinical practice after delivery.

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* Corresponding author.

E-mail address: cmquiros@clinic.ub.es (C. Quirós).

PALABRAS CLAVE

Diabetes Mellitus tipo 1;
Periodo posparto;
Peso corporal

Control metabólico posparto en una cohorte de mujeres con diabetes tipo 1**Resumen**

Antecedentes y objetivo: La gestación en mujeres con diabetes tipo 1 (T1D) conlleva mayor riesgo que en las mujeres sanas; sin embargo, existe menos información acerca del control glucémico y del peso tras la gestación. Nuestro objetivo ha sido evaluar el perfil metabólico posparto (control glucémico y peso) en mujeres con T1D y qué factores están relacionados con dichos resultados metabólicos.

Métodos: Estudio observacional retrospectivo de 36 mujeres con T1D durante el embarazo y hasta un año posparto.

Resultados: El 50% de las pacientes realizaron un programa de planificación pregestacional (PPP) y el 44,4% realizaban tratamiento con infusor subcutáneo de insulina. La HbA1c y el índice de masa corporal (IMC) fueron de $7,2 \pm 1,2\%$ y $23,8 \pm 5,0$ respectivamente. En la cohorte total se observó un empeoramiento significativo del control glucémico al año posparto ($7,2 \pm 1,2$ vs $7,6 \pm 1,2\%$, $p < 0,001$). Las pacientes que acudieron al PPP ($6,6 \pm 0,5$ vs $7,8 \pm 1,4\%$; $p = 0,02$) presentaban una menor HbA1c pregestacional, y esto se mantuvo un año tras el parto. No se objetivaron diferencias en el índice de masa corporal (IMC) entre el periodo pregestacional y al año posparto en ninguno de los 2 grupos (no PPP $22,5 \pm 4,6$ vs $23,2 \pm 4,8$, $p = 0,078$; PPP $25,4 \pm 3,4$ vs $25,5 \pm 3,4 \text{ kg/m}^2$, $p = 0,947$). La HbA1c fue el mayor determinante del grado de control metabólico ($\beta = 0,962$, $p < 0,001$) y del peso un año posparto ($\beta = 0,524$, $p = 0,025$) y de la ganancia ponderal durante la gestación ($\beta = 0,633$, $p = 0,004$).

Conclusiones: Las mujeres embarazadas con T1D recuperan el peso preconcepcional al año posparto, especialmente aquellas con menor HbA1c e IMC pregestación. Sin embargo, el control glucémico se deteriora tras el parto, sugiriendo que es necesario modificar nuestra práctica clínica en este periodo.

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Introduction

It is widely known that the risk of both maternal and fetal adverse effects is higher in patients with pre-gestational diabetes (type 1 and type 2) compared to the general population.¹ A poor metabolic control prior to pregnancy and in the first weeks of gestation has been associated with an increased risk of spontaneous miscarriages² and congenital malformations.³⁻⁵ Similarly, it has been observed that poor glycemic control during the second and third trimesters of pregnancy is associated with an increased rate of preterm delivery, pre-eclampsia, macrosomia and maternal and perinatal morbidity and mortality.^{6,7}

For these reasons, guidelines and consensus documents currently recommend optimizing glycemic control in the pre-gestational period and maintaining glucose levels as close as possible to normoglycemia throughout pregnancy.^{8,9} Most of the studies performed in the last decades in type 1 diabetes (T1D) pregnant women have been conducted to clarify what kind of therapy (continuous subcutaneous insulin infusion – CSII vs multiple doses of insulin – MDI) is most appropriate to achieve these glycemic control objectives and to reduce maternal and perinatal morbidity and mortality, although no differences were found between both therapies.¹⁰⁻¹² However, a better glycemic control and also a reduction in adverse events on both maternal and fetal outcomes in patients included in a prepregnancy planning program (PPP) has been shown in non-randomized studies.¹³

Nevertheless, there is little information about what happens with metabolic control after delivery. A recent

study¹⁴ confirmed prior existing data¹⁵ indicating that after birth there is a marked worsening of glycemic control in such patients. This study observed similar weight gain in pregnant patients with diabetes with respect to a nondiabetic population¹⁶ but less weight lost during the first year after delivery.

With this information available, our study aimed to evaluate the postpartum metabolic profile, including glycemic control and body weight, after pregnancy in women with T1D. In addition, we sought to find which factors before and during pregnancy were related with those metabolic outcomes. For this reason, we analyzed differences between patients who did or did not attend PPP and patients treated with CSII versus MDI.

Subjects and methods

This is a retrospective observational study of 36 pregnant women with type 1 diabetes followed at the Diabetes and Pregnancy Unit of the Hospital Clínic i Universitari of Barcelona during 2011 and 2012. The study was approved by the ethics committee of the hospital. All women were included regardless of whether they had performed the specific pregnancy planning program of our unit. Only the women who did not complete one year of postpartum follow-up in our service were excluded.

During routine follow-up, type 1 diabetic women of fertile age are informed about the importance of planning their gestation and about the availability of the pregestational

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