



RESPONSE TO COMMENT ON FEIG ET AL.

Pumps or Multiple Daily Injections in Pregnancy Involving Type 1 Diabetes: A Prespecified Analysis of the CONCEPTT Randomized Trial. *Diabetes Care* 2018;41:2471–2479

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We thank Sacha and Lane (1) for their interest in our multicenter, multinational randomized Continuous Glucose Monitoring in Women With Type 1 Diabetes in Pregnancy Trial (CONCEPTT). First, we should clarify that the randomized controlled trial was designed to evaluate the impact of continuous glucose monitoring (CGM) in women with type 1 diabetes (T1D) who were pregnant or planning pregnancy (2). Of note, CGM was beneficial on a range of maternal second and third trimester glycemic outcomes, with a halving in the odds ratio for neonatal large for gestational age, neonatal hypoglycemia, and neonatal intensive care unit admissions >24 h (3). Furthermore, the treatment effect of CGM was comparable across 31 international sites and between women using insulin pumps and contemporary multiple daily injection (MDI) regimens. Given the paucity of randomized trial data comparing insulin pumps with MDI using contemporary fast- and long-acting insulin analogs, we stratified the CONCEPTT randomization procedures to evenly distribute

CGM among pump and MDI users. This prespecified secondary analysis in women with comparable first trimester glycemia (which distinguishes our data from other observational case series) (4) did indeed indicate that by 24 weeks' gestation, pregnant women using MDI had a greater decrease in HbA_{1c} and a clinically relevant 5% higher time in range (TiR) 63–140 mg/dL (53% vs. 48%) (5). Interestingly, by 34 weeks' gestation, MDI and pump users had comparable TiR 63–140 mg/dL (65% vs. 64%).

Our interpretation, based on the direct CGM measures, is that first and third trimester maternal glycemia were broadly comparable, with slightly less hypoglycemia and nonsignificantly lower glycemic variability among insulin pump users. We speculate that patients and clinicians are more confident, competent, and potentially more aggressive with second trimester insulin dose increments in a time of increasing insulin resistance, leading to more rapid attainment of glycemic targets in MDI users.

We completely agree with Sacha and Lane (1) that more data are needed regarding the optimal implementation of insulin pump therapy during T1D pregnancy. We are also grateful for the opportunity to clarify that women using pumps and MDI both used modern insulin analogs (>95% in both groups). Pregnant women with T1D invest enormous time and effort to optimize their dietary intake, perform frequent capillary glucose monitoring (with or without CGM), attend clinic appointments every 2 weeks (more often in late gestation), and make day-to-day insulin dose adjustments. Unsurprisingly, this sustained effort and the difficulty in achieving and maintaining optimum glycemia can impact psychosocial well-being, with previous qualitative research describing pregnant women with T1D alternating between “mastery” of their condition and being “enslaved” by it (6). In a trial of 325 women that already included additional demands of research study visits, CGM downloads, and detailed psychosocial questionnaires, it was not practical to collect detailed data on the

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complex patient and clinician behaviors regarding insulin pump usage. Further mixed methods research with semistructured interviews in addition to questionnaires would be needed to examine womens' interactions with insulin pump therapy, how it affects their diabetes self-management, pregnancy experiences, and work and family lives. While we can confirm that the CONCEPTT participants used modern insulin analogs, exploring the complex process interactions between women and health care professionals using pumps was beyond the scope of our current trial.

We hope that these CONCEPTT data will encourage clinicians and researchers to focus on the direct CGM measures, aiming to reach 65–70% TIR as soon as possible in the second trimester. We speculate that to optimize maternal glycemia earlier in the second trimester, more aggressive insulin dose escalation is needed to overcome the

progressive increases in gestational insulin resistance.

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