

Our Experience with Insulin Pump Technology for Type 1 Diabetes in Pregnancy

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Introduction

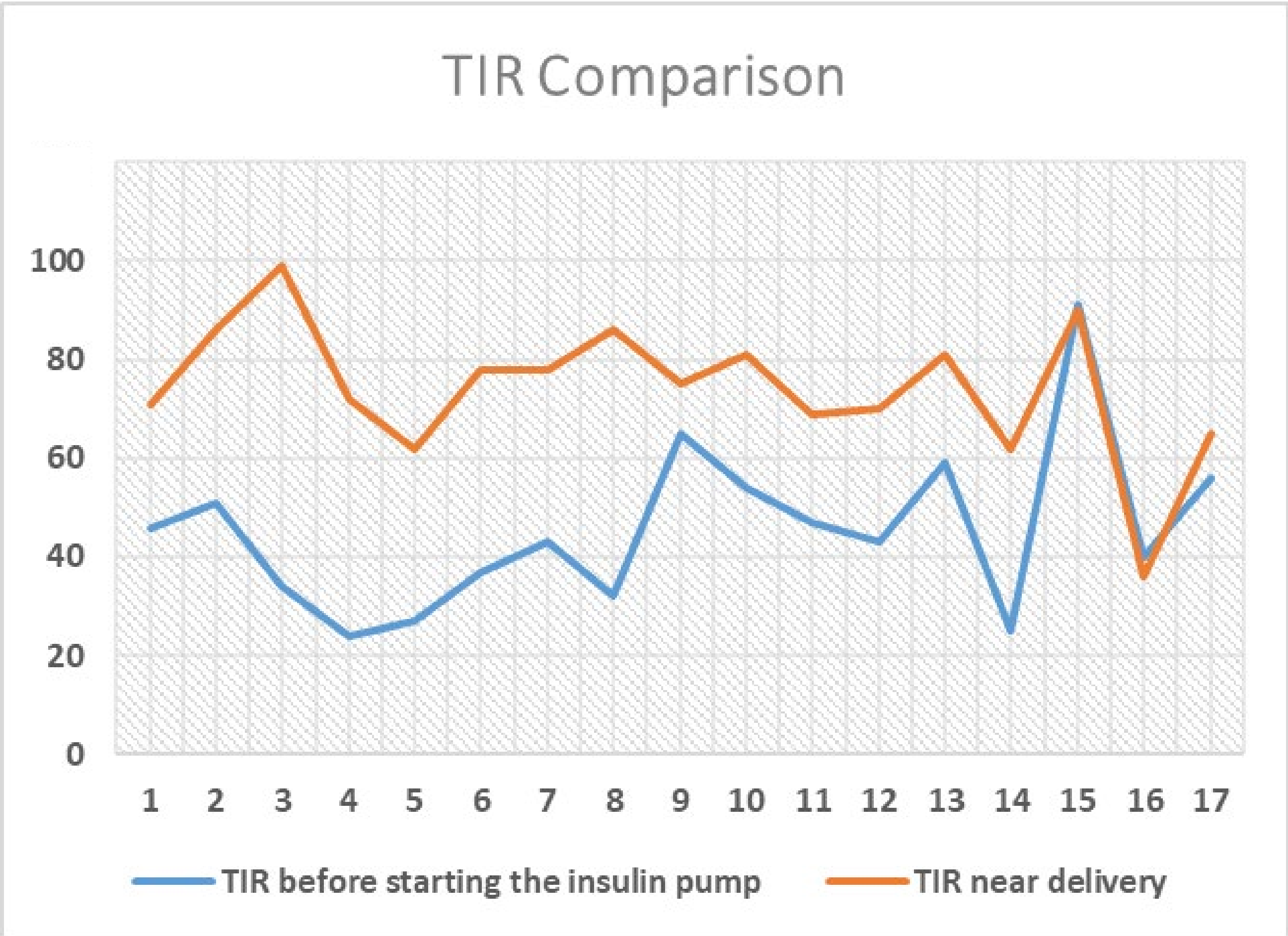
- Hybrid closed loop technology involves using a real time continuous glucose monitor (rtCGM) and an insulin pump to automatically adjust insulin delivery. This technology has been introduced by NHS England for patients with Type 1 diabetes in pregnancy since April 2024.
- While current NICE guidelines suggest that insulin pump therapy and rtCGM have been shown to reduce both blood glucose levels and hypoglycaemic episodes in the non-pregnant population, it is uncertain if this holds true in early pregnancy(*NICE guideline: Diabetes in Pregnancy, 2020*).

Materials and Methods

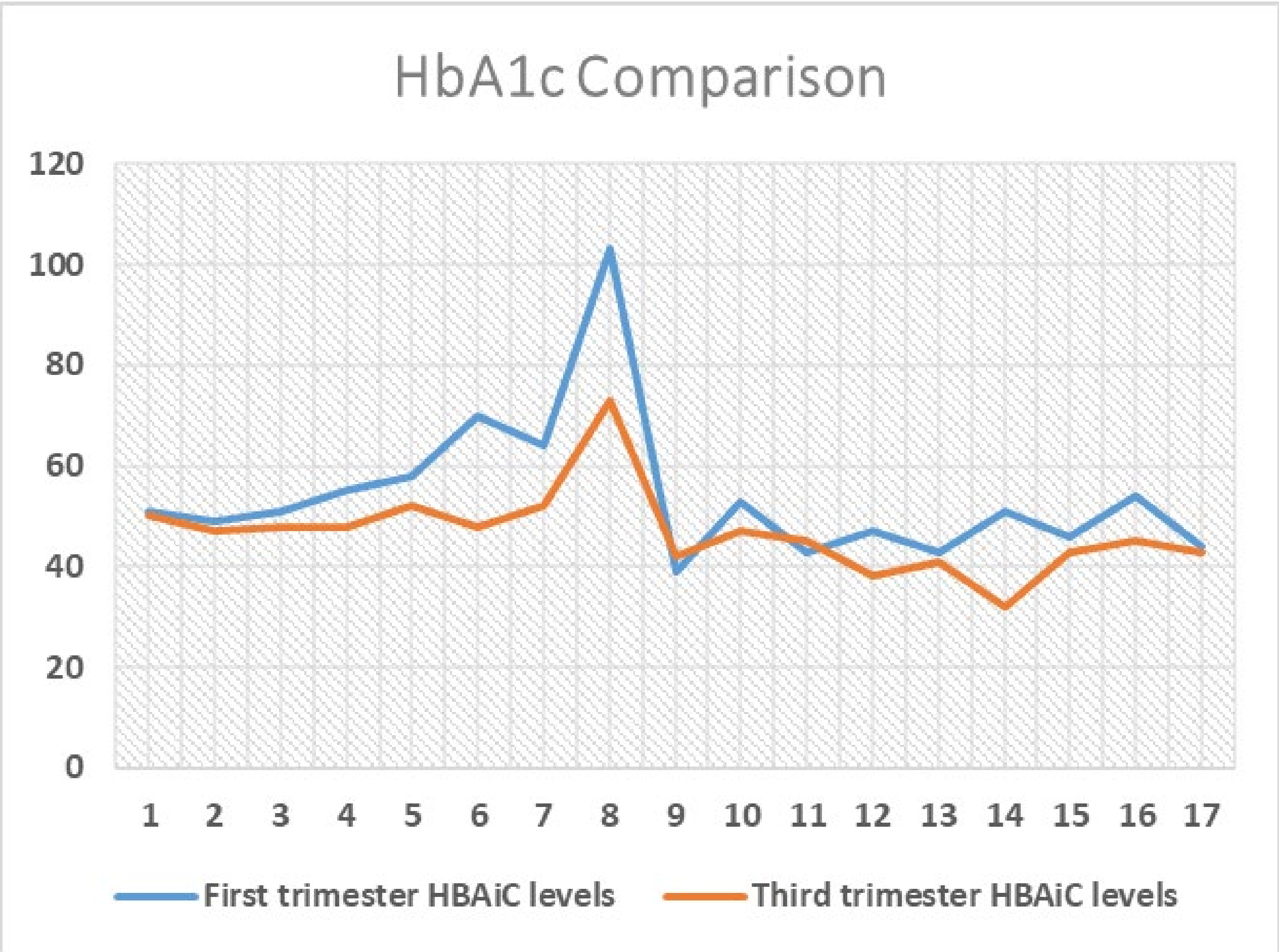
- All patients with Type 1 diabetes who were using or who accepted the transition from multiple daily insulin injections to the insulin pump technology and who had their pregnancies booked at the East and North Hertfordshire Teaching NHS Trust from January 2024 to January 2025 were recruited into study.

Results

- A total of 17 patients were recruited during the study period.
- 47% of patients were transitioned to the YpsoPump. This is the only insulin pump presently licensed for use in pregnancy. 17% and 35% of patients continued use of their Medtronic and Ominpod pump respectively. 3 patients in the study period declined transition to an insulin pump.
- The average gestation of transition to the pump in pregnancy was 20+5 weeks.
- The mean Time in Range (TIR) before pump initiation was 45.53% (SD 16.78), which significantly improved to 74.18% (SD 14.07) near the time of delivery(p value of <0.001).
- Patients who were on the pump pre-conceptually had relatively stable TIR values (62.33% to 63.67%), with no significant rise (p = 0.767). Those who transitioned in the second trimester showed a substantial rise in TIR from 44.00% to 74.20% (p < 0.01), while those who transitioned in the third trimester demonstrated the highest rise in TIR from 36.75% to 82.00% (p = 0.014).



Graph demonstrating the TIR before starting the insulin pump and near delivery. X axis: Patient specific number, Y axis: TIR in %



Graph demonstrating the HbA1c values before starting the insulin pump and near delivery. X axis: Patient specific number, Y axis: HbA1c in mmol/mol

- The mean HbA1c value prior to pump initiation was 54.18 mmol/mol (SD 14.80), which declined to 46.71 mmol/mol (SD 8.45) near delivery (p value of <0.003).
- Intrapartum only 35% of the patients needed to transition to variable rate insulin infusion to achieve glycemic control in labour.
- 50% of the babies born were large for gestational age (LGA) at birth, while 42% were born prematurely. 42% of babies needed transfer to NICU at birth.
- All the patients reported using the insulin pump to be a positive experience and found it to be much less burdensome than multiple daily insulin injections, thus resulting in not only improved glycemic control but also reduced anxiety and stress during pregnancy.

Conclusions

- Insulin pump therapy in pregnancy was found to result in statistically significant improved glycemic control near delivery, regardless of the gestational age at initiation.