Table 2. Characteristics of included studies

Study	Participants	Comparison	Follow-up	Outcome measures	Comments	Risk of bias (per outcome measure)*
Stewart, 2016	N at baseline: 20 Age (mean, SD): 34.1 ± 4.6 BMI: 29.7 ± 5.7 Duration of DM1 in years: 23.6 ± 7.2	Intervention: Overnight Sensor-augmented pump therapy with closed-loop system (4 weeks). Control: Sensor-augmented pump therapy (4 weeks) Note: After completion of the randomly assigned interventions, participants could choose to continue sensor-augmented pump therapy or the day-and-night closed-loop system with manually administered boluses before meals until delivery.	Run-in period: 2 – 4 weeks (for device training and optimization of insulin doses) Intervention/control: 4 weeks Washout period: 2-4 weeks (participants were asked finger-stick testing, with or without continuous glucose monitoring or pump therapy, but could not use the closed-loop system.)	Time in range and hypoglycemia (both only overnight)	Of the 20 participants, three withdrew during the run-in training phase and 17 underwent randomization. One participant withdrew during her first study phase (sensor-augmented pump therapy) because of termination of pregnancy for trisomy 13. During the washout period all participants choose to continue the study continuous glucose monitoring and insulin pump devices.	Moderate RoB (all outcomes)
Stewart, 2018	N at baseline: 17 Age (mean, SD): 32.8 ± 5.0 BMI: 26.6 ± 4.4	Intervention: day-and-night closed-loop insulin delivery (4 weeks)	Run-in period: 2 – 4 weeks (for device training and optimization of insulin doses)	Time in range and hypoglycemia	Of the 19 participants, two dropped out during training phase. One participant withdrew during her first study phase (sensor-augmented pump therapy)	Moderate RoB (all outcomes)

	Duration of DM1 in years: 19.4 ± 10.2	Control: Sensor-augmented pump therapy (4 weeks) Note: After the randomized trial, participants could choose to resume their previous intensive insulin therapy or continue to use the study devices (any combination of CGM, pump, or closed-loop) throughout pregnancy and delivery and for up to 6 weeks postpartum.	Intervention/control: 4 weeks Washout period: 1-2 weeks		as a result of preterm preterm rupture of membranes, severe oligohydramnios, and termination of pregnancy because of poor fetal prognosis.	
Benhalima, 2024	N at baseline Intervention: 46 Control: 49 Age (mean, SD) Intervention: 30.8 ± 4.6 Control: 30.3 ± 3.9 BMI: Intervention: 26.0 ±3.6 Control: 26.9 ± 5.4 Duration of DM1 in years:	Intervention: Advanced hybrid closed loop therapy. MiniMed 780G AHCL combined with CGM Control: Standard insulin therapy with multiple daily injections, standalone insulin pumps, or sensor-augmented pump therapy with	Run-in phase: 10 days (for baseline glycaemic assessment with a CGM) Women started at a median of 10.1 (IQR 8.6–11.6) weeks of gestation, until delivery.	Time in range, hypoglycemia, Diabetes ketoacidosis (defined as: pH 7.30 or lower, bicarbonate 18 mmol/L or lower, anion gap higher than 10, and ketones positive in urine or serum), large for gestational age,	Of the women included in the intervention, 43 gave birth. Of the women included in the control, 46 gave birth.	Low RoB (live birth and preterm birth) Moderate RoB (all other outcomes)

	Intervention: 17.0 ± 9.2 Control: 30.3 ± 3.8	predictive suspension of insulin infusion before or at low sensor glucose concentration, combined with CGM.		live birth, PE, PIH, HELLP, preterm birth, NICU admission, and congenital abnormalities		
Lee, 2023	N at baseline Intervention: 61 Control: 63 Age (mean, SD) Intervention: 32.0 ± 5.0 Control: 30.2 ± 5.5 BMI: Intervention: 27.9 ± 5.9 Control: 26.9 ± 4.8 Duration of DM1 in years: Intervention: 18.8 ± 8 Control: 16 ± 7	Intervention: Automated hybrid closed-loop therapy in combination with continuous glucose monitoring. Control: Standard insulin therapy (by means of multiple daily injections or an insulin pump) in combination with continuous glucose monitoring.	Run-in period: 4-to-10 days (to provide a baseline glycemic assessment (≥96 hours of glucose values, including 24 hours overnight) and to ensure that continuous glucose monitoring was not associated with unacceptable effects. Started > 16 weeks' gestation until delivery.	Time in range, hypoglycemia, Diabetes ketoacidosis (defined as ketosis with acidosis that resulted in treatment with fixed-rate intravenous insulin infusion), large for gestational age, live birth, PE, preterm birth, and NICU admission.	Differences in baseline characteristics: Participants in the closed-loop group had more previous pregnancies, whereas those in the standard-care group reported more previous diabetic ketoacidosis events.	Low RoB (live birth and preterm birth) Moderate RoB (all other outcomes)
Polsky, 2024	N at baseline Intervention: 11 Control: 12 Age (mean, SD) Intervention: 30.7 ± 3.5 Control: 31.5 ± 4.9 BMI:	Intervention: Hybrid closed loop therapy Control: Sensor-augmented pump therapy	Run-in period: 1 week Started between 14 and 18 weeks gestation, continued until 4-6 weeks postpartum (however, HCL was	Time in range, hypoglycemia, Diabetes ketoacidosis, large for gestational age, live birth, PE, preterm birth,	Funded by industry but disclosure states: The content of this publication is the authors' sole responsibility and does not necessarily represent official	Low RoB (live birth and preterm birth) Moderate RoB (all other outcomes)

	Intervention: 27.4 ± 4.4 Control: 30.5 ± 5.9 Duration of DM1 in years: Intervention: 18.0 ± 6.7 Control: 20.6 ± 8.6		stopped for hospital admissions (including labor and delivery [L&D]). HCL was resumed between 3 and 7 days postpartum.)	and NICU admission.	JDRF, Medtronic MiniMed, Inc., Children's Diabetes Foundation, University of Colorado Denver, or NIH views.	

AID: Automated insulin delivery; CGM: continuous glucose monitoring; HCL: Hybrid closed loop; PE: preeclampsia; PIH: pregnancy-induced hypertension; HELLP: hemolysis, elevated liver enzymes, and low platelet count

*For further details, see risk of bias table in the appendix