

CHRD 2024: Abstract Submission Form

Presenter Name

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Presenter Status

Undergraduate Students

Role in the project

Design

Abstract and full text screen and data extraction

Research Category

Community Health / Policy

Title

Effect of Automated Insulin Delivery Systems in Children and Adolescents living with Type 1 Diabetes on Time in Range and Glycemic Control: A Systematic Review and Meta-Analysis

Background

Automated insulin delivery (AID) systems are more commonly used by youth with type 1 (T1D). There currently are only low-quality systematic reviews on this topic.

Objective

We conducted a systematic review and meta-analysis of randomized controlled trials (RCTs) to test the hypothesis that AID's improve measures of glucose control and reduce adverse events, compared to other strategies

Methods

We searched MEDLINE, EMBASE, CINAHL, and central from January 2017 to May 2024 for eligible RCTs that assessed the efficacy of AIDs (closed-loop, hybrid closed-loop; DIY looping) on measures of glucose control, and adverse events in youth 6-18 years old with T1D. Two reviewers independently screened studies for eligibility, extracted data, and assessed studies. Random effects meta-analysis models estimated mean differences (MD) in main outcomes with 95% confidence intervals (95%CI) (Prospero: CRD42024555186)

Results

Of 2054 citations retrieved, 11 RCTs (n = 879 participants) with measures of HbA1c and 10 studies (n = 786 participants) with measures of time in range were included. RCTs tested interventions lasting 31 ± 26 weeks, on youth 12 yrs old (range 11.1-15.9 yrs); 52% were girls, 79% were white, and the mean HbA1c at baseline of $8.5 \pm 1.0\%$. Random effects models revealed that, compared to controls, HbA1c was reduced -0.46% (95% CI: -0.61 to -0.30%, I²=20%), while time in range increased 11.5% (95% CI: +9.3-13.7%, I²=23%). Random effects models also revealed that time spent in hypoglycemia (<3.9 mmol/L) (MD= -0.32%, 95% CI -0.60 to -0.03%, I²=18%, n = 580 youth) and hyperglycemia (>10 mmol/L) (MD= -10.8%, 95% CI -14.4 to -7.2%, I²=55%, n = 674 youth) were both reduced with the use of an AID compared to controls.. Only 5 studies reported adverse events.

Conclusion

The use of an AID in youth living with T1D significantly improves measures of glucose control and reduces the risk of both hyper and hypoglycemia.

Do you have a table/figure to upload?

No

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