**Abstract title:**

Automated Insulin Delivery Driven By Open-Source Algorithms Improves Time-In-Range in Type 1 Diabetes With Suboptimal Baseline Glycaemic Control

**Abstract content:**

Aim

To assess the efficacy of open-source automated insulin delivery (OSAID) in patients with suboptimal baseline glycaemia.

Methods

This single-centre retrospective cohort study assessed the glycaemic and quality-of-life (QoL) outcomes of clinic-supported OSAID commencers with suboptimal baseline glycaemic control. Included patients had type 1 diabetes, with HbA1c ≥8% and/or time-in-range (TIR) ≤50%. They commenced OSAID between 2020 and 2022 at BCDiabetes, a clinic in Vancouver, Canada with a large-scale clinical program supporting people with diabetes to commence OSAID. The specific OSAID algorithm commenced was per patient preference following education, with the options being either Loop, AndroidAPS or iAPS. CGM data were collected immediately prior and 3 weeks after starting OSAID. Laboratory HbA1c was collected before OSAID start, and approximately 3 months after OSAID start.

Results

77 patients (59 adults and 18 children/adolescents) were included. Median TIR improved from 45% before OSAID to 74% on OSAID (p <0.001), see Table 1. HbA1c improved from 8.1% to 7.2% (p <0.001). QoL scales, available for 25 patients, showed improvements in Diabetes Distress and Hypoglycaemia Fear.

Conclusion

Patients with suboptimal baseline glycaemia, a relatively under-studied group in relation to use of OSAID, had significant improvements in TIR with this technology.

**Table 1**: Change in glycaemia with use of OSAID

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **n** | **Pre-OSAID** | **Post-OSAID** | **Change** | **p value** |
| TIR (%) | 77 | 45 (37 – 51) | 74 (66 – 79) | +29 | <0.0001 |
| TBR (%) | 77 | 1.0 (0.2 – 2.2) | 1.2 (0.4 – 2.4) | +0.2 | 0.33 |
| Laboratory HbA1c (%) | 69 | 8.1 (7.8 – 8.6) | 7.2 (6.7 – 7.6) | -0.9 | <0.0001 |

Data are expressed as median (IQR).

TBR = Time-Below-Range <4mmol/L, TIR = Time-In-Range 4-10mmol/L.

Data was missing for paired laboratory A1c in 8 patients.