Intermittently scanned continuous glucose monitoring improves glycemic control in adolescents with type 1 diabetes on insulin pumps

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Aim: Our knowledge on the effects of intermittently scanned continuous glucose monitoring (isCGM) on adolescents with type 1 diabetes is limited. We evaluated how isCGM affects quality of life and HbA_{1c} in adolescents with type 1 diabetes.

Methods: This non-randomized controlled study enrolled 44 adolescents 11 to 18 of age from three different pediatric diabetes centers (Uppsala, Västerås and Örebro) in Sweden. There were no significant differences between the groups in baseline characteristics. The isCGM group used FreeStyle Libre® (n=26) and the control group (n=18) used capillary blood glucose testing. At baseline the participants and their parents completed quality of life questionnaires (PedsQL 3.0 and 4.0), diabetes treatment satisfaction questionnaire (DTSQ) and measured

HbA_{1c}. Follow-up with the same questionnaires and HbA_{1c} was performed after 3-4 months. Data were analyzed on all included subjects but also divided into subjects using insulin pump therapy and multiple daily injections.

Results: HbA_{1c} at baseline was 55,4±9,1 mmol/mol in the isCGM group and 54,4±10,1 mmol/mol in the control group. There was a trend towards a reduction of HbA_{1c} in the isCGM group (-2,1±9,1 mmol/mol) and the control group (-0,1±5,4 mmol/mol) (ns).

The adolescents using insulin pump therapy had a significant improvement of HbA_{1c} in the isCGM group (from 56,1±7,7 to 50,8±8,9 mmol/mol) compared to the control group (from 57,4±10,9 to 58,0±9,4 mmol/mol) p=0,037 without any adverse effect in quality of life or increased rate of severe hypoglycemia.

Treatment satisfaction was improved in both the isCGM group and in the control group, with no significant difference between groups. There was no significant change in quality of life comparing the isCGM group to the control group.

Conclusion: We observed improved HbA_{1c} in adolescents using insulin pump therapy after introduction of isCGM. Larger studies are needed to confirm this finding.