

Insulin Doses before and One Year after Pump Start: Children Have a Reversed Dawn Phenomenon

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Abstract

Objective:

We aimed to investigate the basal rate and bolus doses in children and adolescents at the start of insulin pump therapy and after 1 year of use.

Patients and Methods:

Case records from 29 children and adolescents were examined. All pumps were started with rapid-acting insulin (Humalog). Patients were aged 13.1 ± 3.9 years, with a diabetes duration of 5.4 ± 4.1 years at pump start. Sixteen pumps were started for high hemoglobin A1c (HbA1c; $>8.8\%$, 73 mmol/mol) and 13 for other reasons.

Results:

Basal rates declined in both groups by 20% at 3 days after pump start. The bolus doses were reduced by 25–30% when the indication was high HbA1c and by 15% in the others. After 1 year, there was a significant difference in the basal rate between age groups. The 3–9-year-old age group had higher basal rates during the late evening (10:00 PM–12:00 AM), while the 15–21-year-old age group had higher basal rates in the early morning (3:00 AM–7:00 AM).

Conclusions:

Insulin doses are reduced considerably when starting with a pump in pediatric practice. Younger children needed higher basal rates late in the evening (reversed dawn phenomenon), while older teenagers seem to need an increase in the morning, which may correspond to a true dawn phenomenon.

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Abbreviations: (HbA1c) hemoglobin A1c, (MDI) multiple daily injections, (PG) plasma glucose, (REM) rapid eye movement, (TDD) total daily dose

Keywords: basal rate, bolus doses, children, dawn phenomenon, diabetes, insulin pump

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