A Prospective Evaluation of Insulin Dosing Recommendations in Patients with Type 1 Diabetes at Near Normal Glucose Control: Basal Dosing

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Abstract

Background:

Current basal insulin dosing recommendations are based on retrospective studies of Type 1 patients with diabetes in whom the glucose control was not intensely established. Using continuous glucose monitoring (CGM) we prospectively studied these recommendations in patients treated with continuous subcutaneous insulin infusion.

Methods:

With CGM 30 subjects were titrated with daily insulin adjustments to achieve a basal glucose targets of <5% of values <70 mg/dl and <20%, >170mg/dl. The basal rate during meal time was studied by a sequential daily single meal omission until the glucose goals were achieved.

Results:

Glucose targets were achieved in all subjects. The observed ratios of total basal dose (TBD) to total daily dose and TBD to weight, in kilograms, were 0.384 and 0.185, respectively. Previously reported formulas for estimating the TBD resulted in significantly higher values than we observed. The difference between the maximum to the minimum hourly basal insulin infusion rate was more than 100% and the peak rate was reached by 0200 hours in 73% of subjects. During the post study observation period in which there was no further study intervention and in those subjects with baseline A1C >6.9%, the A1C decreased 0.45 % (p = 0.0110) in a mean of 12.8 weeks.

Conclusions:

Current literature overestimates TBD dose and underestimates the degree and the time of onset of the dawn phenomenon. Maintaining near normal glycemia in the ambulatory setting may be achieved in selected Type 1 patients for at least two weeks and maybe longer.

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