Insulin Pump Therapy for Dawn Phenomenon
Objective

To show how insulin pumps can be effective in the treatment of the Dawn Phenomenon

Key Points

• Gain insight on the theory behind Dawn Phenomenon
• Study clinical evidence for the use of insulin pumps in the treatment of Dawn Phenomenon
“Continuous subcutaneous insulin infusion with an insulin pump is indicated for patients with a history of dawn phenomenon”

2007 American Association of Clinical Endocrinologists Medical Guidelines For Clinical Practice for the Management of Diabetes Mellitus

“CSII may be beneficial in children and adolescents with a pronounced dawn phenomenon”

Consensus Statement On Use Of Insulin Pump Therapy In The Pediatric Age Group, Endorsed By The ADA And EASD

Basal Insulin Needs Vary Throughout the Day

Results indicate it is not reasonable to expect basal insulin needs to be met by a flat rate of insulin delivery for 24 hours.

Pronounced Hyperglycemia During Early Morning Hours

• **Definition of Dawn Phenomenon**: An increase of >10 mg/dL in plasma glucose levels, or a >20% increase in insulin requirement from the overnight state, between the hours of 4 a.m. and 8 a.m.

• **Pathogenesis**: Most likely reason is growth hormone-mediated impairment of insulin sensitivity at the liver and muscles

• **Prevalence**: Dawn phenomenon is present in between 54% to 89% of patients with type 1 diabetes

Adapted from Ludvigsson J, Hanas R. *Pediatrics*. 2003; 111: 933-938.
Carrol MF, Schade DS. *Endocr Practice*. 2005; 11: 55-64.
Insulin Pump Users Program Multiple Basal Rates According to their Daily Routine

A typical profile of basal insulin rates in CSII. Many people are more active in the late afternoon, and more sedentary after dinner, necessitating adjustment to the basal rate.

CSII Controls Dawn Phenomenon by Allowing Multiple Basal Rates

In 10 patients with type 1 diabetes and demonstrated dawn phenomenon, adjusting the overnight insulin infusion rates abolished dawn phenomenon and significantly decreased the plasma glucose levels to match healthy controls.
“CSII is the most physiological method of insulin delivery currently available”

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