Journal of Diabetes Science and Technology
Volume 2, Issue 3, May 2008

SYMPOSIUM

Safety and Effectiveness of a Computerized Subcutaneous Insulin Program to Treat Inpatient Hyperglycemia

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Abstract

Background:
This proof of concept study was designed to evaluate the safety and effectiveness of a computerized insulin program, the Clarian GlucoStabilizer™ Subcutaneous Insulin Program (CGS-SQ). This paper discusses the CGS-SQ's impact on the glycemic control of hospitalized patients with hyperglycemia.

Methods:
Patients at Methodist and Indiana University Hospitals requiring subcutaneous insulin were treated using the CGS-SQ. This program calculates subcutaneous bolus insulin doses based on the current blood glucose (BG), using an insulin sensitivity factor, the number of grams of carbohydrates eaten, and an insulin-to-carbohydrate ratio, with a goal of maintaining the patient's BG in a prespecified target range. The target range, insulin sensitivity factor, and insulin-to-carbohydrate ratio are established by the physician.

Results:
From April 2006 to September 2007, the CGS-SQ treated 1772 patients at Methodist and Indiana University Hospitals, with 46,575 BGs in its database. For these patients, the average BG was 158.3 mg/dl, 40.5% percent of BGs were in the default target range of 100–150 mg/dl, and 69.8% were in the wider range of 70–180 mg/dl. The hypoglycemia (BG <40 mg/dl) rate was 0.18%.

Conclusions:
The CGS-SQ provided a means to deliver insulin in a standardized manner, resulting in satisfactory BG control with a low hypoglycemia rate, thus serving as a tool for safe and effective insulin therapy for hospitalized patients.

J Diabetes Sci Technol 2008;2(3):384-391

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Abbreviations: (BG) blood glucose, (CGS-IV) Clarian GlucoStabilizer™ program, (CGS-SQ) Clarian GlucoStabilizer™ Subcutaneous Insulin Program, (ICR) insulin-to-carbohydrate ratio, (ISF) insulin sensitivity factor, (IV) intravenous, (SUGAR) Systematic Utilization of Glucose Assessment and Response, (TDD) total daily dose, (TPN) total parenteral nutrition

Keywords: computers, diabetes, dosing, hyperglycemia, insulin, subcutaneous, protocol

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