Optimal glucose control has been shown to be useful in critical care as well as in other settings. Glucose concentrations in patients admitted to critical care are characterized by marked variability and hypoglycemia due to inadequate sensing and treatment technologies” Hashemi et al (2019).

Abstract:

BACKGROUND: Optimal glucose control has been shown to be useful in critical care as well as in other settings. Glucose concentrations in patients admitted to critical care are characterized by marked variability and hypoglycemia due to inadequate sensing and treatment technologies.

METHODS: The insulin balanced infusion system (IBIS) is a closed-loop system that uses a system controller, two syringe pumps, and capillary glucose sensor intravenously infusing regular insulin and/or dextrose. The IBIS performance was evaluated in terms of glucose stability in response to various conditions in subjects with type 1 and insulin requiring type 2 diabetes mellitus (n = 15) with frequent intermittent capillary measurements, entered into the system and an adaptive algorithm adjusting the treatment modalities without other nursing intervention.

RESULTS: Target glucose concentrations (80-125 mg/dl) were achieved from hyperglycemic levels in 2.49 hours in the first study with mean and standard deviation of 105.2 mg/dl and 11.5 mg/dl, respectively.

CONCLUSION: Preliminary studies using a prototype closed-loop glucose control system for critical care produced noticeable results. Improvements were initiated within the system and further studies performed.

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