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SYMPOSIUM

Improvement in Glycemic Control and Outcome Corresponding to Intensive Insulin Therapy Protocol Development

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Abstract

Background:

Intensive insulin therapy (IIT) has been shown to reduce mortality and morbidity in longer stay, critically ill patients. However, this has been demonstrated in a single site, whereas two multicentric studies have been terminated prematurely mainly due to hypoglycemia. Other difficulties with IIT include efficacy of glycemic control. This report describes how IIT can be improved by protocol simplification and removal of glucose supplementation.

Methods:

A clinical information system established at each bedspace guided staff through the IIT algorithms. Time spent within predefined glycemic ranges was calculated assuming a linear trend between successive measurements. Three groups were investigated retrospectively: IIT1 protocol,[1] an updated IIT2 version, and intuitive nurse dosing of conventional insulin therapy (CIT).

Results:

Fifty consecutive, critically ill patients were included in each study group. Patient characteristics were similar in each group. The frequency of CIT and IIT2 blood glucose measurements were 11.6 and 11.5 measurements per day, respectively, while the IIT1 measurements were more frequent (14.5 measurements per day). The mean proportion of time spent in the target glycemic range (4.4–6.1 mmol/liter) was highest in the IIT2 group (34.9%), as compared to the IIT1 (22.9%) and CIT groups (20.3%) (p <.001). Survival at 28 days was 74.5% for IIT2 (highest), 68% for IIT1, and 48% for CIT (p = .02). There were a similar number of those experiencing a severe hypoglycemic event in each group.

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Abbreviations: (APACHE) Acute Physiology and Chronic Health Evaluation, (BG) blood glucose, (CIT) conventional insulin therapy, (ICU) intensive care unit, (IIT) intensive insulin therapy, (IQR) interquartile range, (TGC) tight glycemic control

Keywords: blood glucose, critically ill, insulin, tight glycemic control

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Abstract cont.

Conclusions:

IIT protocol optimization was associated with increased glycemic control and improved 28-day survival. The better optimized IIT2 protocol provided tighter control than either the IIT1 or CIT protocol, without increased sampling or incidence of hypoglycemia. The clinical effectiveness of the IIT algorithm appeared to be improved by simplifying the protocol to meet the needs of the critical care unit.

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