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ORIGINAL ARTICLE

Glucose Control in Mayo Clinic Intensive Care Units

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Abstract

Background:

Safe and effective glucose control in the intensive care unit (ICU) continues to be actively pursued. Large clinical trials have examined the safety and efficacy of insulin infusion protocols in medical and surgical ICUs. We report experiences of a single-center standardized nurse-driven insulin infusion protocol in three ICUs in an observational quality-improvement study.

Method:

We analyzed the hourly point-of-care arterial blood glucose obtained during ICU insulin infusion protocol (protocol A) with a glucose target of 80–130 mg/dl in medical and surgical ICUs in February 2009. Following Normoglycemia in Intensive Care Evaluation and Survival Using Glucose Algorithm Regulation (NICE-SUGAR) study results, the protocol was amended (protocol B) to achieve target glucose of 110–150 mg/dl. The performance of protocol B was assessed in the ICUs in May 2010 and compared with protocol A with respect to glucose concentrations and rates of severe (<40 mg/dl) and moderate (40–60 mg/dl) hypoglycemia.

Results:

With protocol A, in medical (n = 44) and surgical (n = 164) ICUs taken together, median glucose was 119 mg/dl, with severe and moderate hypoglycemia rates 1.4% (3/208) and 7.7% (16/208), respectively, which were significantly lower than those reported by the NICE-SUGAR and the Leuven studies. With protocol B, in medical (n = 44) and surgical (n = 167) ICUs taken together, median glucose was 132 mg/dl, with severe and moderate hypoglycemia of 0 % (0/211) and 0.5% (1/211), respectively.

Conclusion:

The current ICU insulin infusion protocol (protocol B) reduces severe and moderate hypoglycemia without compromising glucose control when compared with protocol A. This could potentially impact patient-important outcomes.

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Abbreviations: (ICU) intensive care unit, (NICE-SUGAR) Normoglycemia in Intensive Care Evaluation and Survival Using Glucose Algorithm Regulation, (T1DM) type 1 diabetes mellitus, (T2DM) type 2 diabetes mellitus

Keywords: hypoglycemia, insulin infusion, intensive care unit, point-of-care glucose

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