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Tight glucose control in the critically ill improves survival

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Context

Stress induced hyperglycemia is common in critically ill patients and may be associated with an increased rate of infectious complications (see Additional information [1]). Harmful effects of growth hormone therapy (see Additional information [2]) and parenteral nutrition (see Additional information [3]) may be related, at least in part, to the prevalence of hyperglycemia in critically ill patients. Intensive glucose management has been shown to improve survival in patients with diabetes mellitus and acute myocardial infarction (see Additional information [4]). This controlled trial investigates glucose management in nondiabetic surgical and critically ill patients.

Significant findings

In total, 1548 patients were enrolled. There were no significant differences between the intensive-therapy group and control group at randomization.

Following intervention the mean morning glucose levels were 103 mg/dl in the intensive-therapy group versus 153 mg/dl in the control group. Crude hospital mortality was 7.2% in the intensive-therapy group and 10.9% in the control group ($P = 0.01$). The benefit was even more significant in the subgroup of patients receiving intensive care for >5 days (mortality rate 16.8% versus 26.3%). The mortality benefit was associated with a 46% decrease in bloodstream infections.

Comments

Although nonblinded and restricted to patients undergoing cardiac surgery this study will, in all likelihood, have a great impact on the management of critically ill patients. For diabetic patients with acute myocardial infarction and for patients with or without diabetes mellitus recovering from cardiac

surgery, data appear strong. There is no reason to believe this would not be applicable to critically ill patients in general.

Methods

Patients receiving mechanical ventilation in a cardiac surgery intensive care unit were randomized to conventional (insulin drip only if blood glucose level above 200 mg/dl) and strict glucose control (insulin drip to maintain normal blood glucose level [80-110 mg/dl]).

Additional information

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4. Malmberg K, Norhammar A, Wedel H, Ryden L: **Glycometabolic state at admission: important risk marker of mortality in conventionally treated patients with diabetes mellitus and acute myocardial infarction: long-term results from the Diabetes and Insulin-Glucose Infusion in Acute Myocardial Infarction (DIGAMI) study.** *Circulation* 1999, **99**:2626-2632.

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