ICU
MANAGEMENT & PRACTICE

Does Tight Glycaemic Control Benefit Critically Ill Children?

Critically ill children with hyperglycaemia did not benefit from tight glycaemic control targetted to a blood glucose level of 80 to 110 mg per decilitre, as compared with a level of 150 to 180 mg per decilitre, according to results of a multicentre trial reported in The New England Journal of Medicine. The trial was stopped early, on the recommendation of the data and safety monitoring board, owing to a low likelihood of benefit and evidence of the possibility of harm.

See Also: Current State of Glycaemic Control Practice

In multicentre studies, tight glycaemic control targetting a normal blood glucose level has not been shown to improve outcomes in critically ill adults or children after cardiac surgery. Studies involving critically ill children who have not undergone cardiac surgery are lacking.

Furthermore, a survey of paediatric intensivists has found wide variation in glycaemic control practice and equipoise between lower and higher glucose targets, which justifies further study. Paediatric intensivists indicated that safe adjustment of continuous intravenous insulin to minimise the risk of hypoglycaemia was crucial.

In this new 35-centre trial, the researchers randomly assigned critically ill children with confirmed hyperglycaemia (excluding patients who had undergone cardiac surgery) to one of two ranges of glycaemic control: 80 to 110 mg per decilitre (4.4 to 6.1 mmol per litre; lower-target group) or 150 to 180 mg per decilitre (8.3 to 10.0 mmol per litre; higher-target group). Clinicians were guided by continuous glucose monitoring and explicit methods for insulin adjustment. The primary outcome was the number of intensive care unit (ICU)-free days to day 28.

Of the total 713 patients in the study, 360 were randomly assigned to the lower-target group and 353 to the higher-target group. In the intention-to-treat analysis, the median number of ICU-free days did not differ significantly between the lower-target group and the higher-target group (19.4 days [interquartile range {IQR}, 0 to 24.2] and 19.4 days[IQR, 6.7 to 23.9], respectively; P=0.58). In per-protocol analyses, the median time-weighted average glucose level was significantly lower in the lower-target group (109 mg per decilitre [IQR, 102 to 118]; 6.1 mmol per litre [IQR, 5.7 to 6.6]) than in the higher-target group (123 mg per decilitre [IQR, 108 to 142]; 6.8 mmol per litre [IQR, 6.0 to 7.9]; P<0.001).

The results further showed that patients in the lower-target group also had higher rates of healthcare–associated infections than those in the higher-target group (12 of 349 patients [3.4%] vs. 4 of 349 [1.1%], P=0.04), as well as higher rates of severe hypoglycaemia, defined as a blood glucose level below 40 mg per decilitre (2.2 mmol per litre) (18 patients [5.2%] vs. 7 [2.0%], P=0.03). There were no significant differences in mortality, severity of organ dysfunction, or the number of ventilator-free days.

"Our results are consistent with those from other multicentre trials involving other critically ill children. The SPECS (Safe Pediatric Euglycemia in Cardiac Surgery) trial and the CHiP (Control of Hyperglycaemia in Paediatric Intensive Care) trial showed no significant differences in ICU length of stay or mortality among children who had undergone cardiac surgery or in children who had not undergone cardiac surgery," write Michael S.D. Agus, MD, from the Division of Medicine Critical Care and the Department of Cardiology, Boston Children's Hospital and Harvard Medical School, Boston and colleagues.

Source: The New England Journal of Medicine
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