

Late parenteral nutrition beneficial to undernourished critically ill children



In undernourished critically ill children, withholding parenteral nutrition (PN) for one week was clinically superior to early PN, according to a subanalysis of the Pediatric Early vs. Late Parenteral Nutrition in Intensive Care Unit (PEPaNIC) randomised clinical trial.

"In this subanalysis of 289 undernourished critically ill children with insufficient enteral nutritional intake, withholding supplemental parenteral nutrition for one week (late parenteral nutrition) reduced new infections and shortened intensive care dependency, as compared with early (<24 hours) supplemental parenteral nutrition," researchers write.

Undernourishment has been associated with poor outcomes of critical illness in children. In the PEPaNIC trial, compared with well-nourished paediatric intensive care unit (PICU) patients, being acutely undernourished on admission to the PICU was associated with prolonged intensive care dependency.

The prevalence of undernourishment in children on admission to the PICU has been shown to be up to 24 percent. Recently updated guidelines advise to start supplemental PN earlier in undernourished children than in well-nourished children if enteral nutrition (EN) intake is insufficient. This subanalysis of the PEPaNIC RCT assessed the effects of withholding supplemental PN in a subgroup of critically ill children who were acutely undernourished on admission to the PICU. Primary end points were risk of new infections acquired in the PICU and time to live PICU discharge, assessed via multivariable logistic regression and Cox proportional hazard analyses, adjusted for risk factors.

A total of 289 of 1,440 children (20.1%), term newborn to age 17 years, were identified as undernourished, of whom 150 of 717 patients (20.9%) were in the late PN group and 139 of 723 patients (19.2%) were in the early PN group. On admission, characteristics were similar among the treatment groups. Mean (SD) weight z scores were -3.33 (1.18) in the late PN group and -3.21 (1.09) in the early PN group.

Compared with well-nourished PICU patients, undernourishment on admission was associated with lower likelihood of an earlier live PICU discharge (adjusted hazard ratio, 0.86; 95% CI, 0.75-0.99; $P = .03$). Among undernourished PICU patients, late PN reduced the risk of new infections by 11.0% (adjusted odds ratio, 0.39; 95% CI, 0.19-0.78; $P = .01$), and shortened the duration of PICU stay by a median of two days (earlier live PICU discharge: adjusted hazard ratio, 1.37; 95% CI, 1.06-1.75; $P = .01$). The safety outcomes mortality, incidence of hypoglycaemia during the first week, and incidence of weight deterioration during PICU stay were similar between the treatment groups.

"The undernourished children benefited from withholding PN during the first week of critical illness as compared with initiating PN at the first day, as illustrated by a decreased risk of new infections, a shorter dependency on intensive care, and an accelerated live discharge from the hospital," the authors note. "The benefits of late PN were noticeable irrespective of centre, age, disease severity, risk of mortality, diagnosis group, and STRONGkids score on admission. Late PN did not affect the safety outcomes mortality and incidence of hypoglycaemia and was not associated with weight deterioration in the undernourished critically ill children."

(STRONGkids is short for Screening Tool for Risk on Nutritional Status and Growth.)

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