Research Media Watch:

Kamale Vijay, Thamke Rakesh

1. Early versus Late Parenteral Nutrition in Critically Ill Children

Tom Fivez, Dorian Kerklaan, Dieter Mesotten, , Sascha Verbruggen, Pieter J. Wouters, Ilse Vanhorebeek,, Yves Debaveye, Dirk Vlasselaer, Lars Desmet, Michael P. Casaer, Gonzalo Garcia Guerra, Jan Hano, Ari Joff, Dick Tibboel, M.D., Koen Joosten, Ph.D., and Greet Van den Berghe, N Engl J Med 2016; 374:1111-1122 MArch 24,2016DOI: 10.1056/NEJMoa1514762

Background:

Recent trials have questioned the benefit of early parenteral nutrition in adults. The effect of early parenteral nutrition on clinical outcomes in critically ill children is unclear. Methods:They conducted a multicenter, randomized, controlled trial involving 1440 critically ill children to investigate whether withholding parenteral nutrition for 1 week (i.e., providing late parenteral nutrition) in the pediatric intensive care unit (ICU) is clinically superior to providing early parenteral nutrition. Fluid loading was similar in the two groups. The two primary end points were new infection acquired during the ICU stay and the adjusted duration of ICU dependency, as assessed by the number of days in the ICU and as time to discharge alive from ICU. For the 723 patients receiving early parenteral nutrition, parenteral nutrition was initiated within 24 hours after ICU admission, whereas for the 717 patients receiving late parenteral nutrition, parenteral nutrition was not provided until the morning of the 8th day in the ICU. In both groups, enteral nutrition was attempted early and intravenous micronutrients were provided.Results:Although mortality was similar in the two groups, the percentage of patients with a new infection was 10.7% in the group receiving late parenteral nutrition, as compared with 18.5% in the group receiving early parenteral nutrition (adjusted odds ratio, 0.48; 95% confidence interval [CI], 0.35 to 0.66). The mean (±SE) duration of ICU stay was 6.5±0.4 days in the group receiving late parenteral nutrition, as compared with 9.2±0.8 days in the group receiving early parenteral nutrition; there was also a higher likelihood of an earlier live discharge from the ICU at any time in the late-parenteral-nutrition group (adjusted hazard ratio, 1.23; 95% CI, 1.11 to 1.37). Late parenteral nutrition was associated with a shorter duration of mechanical ventilatory support than was early parenteral nutrition (P=0.001), as well as a smaller proportion of patients receiving renal-replacement therapy (P=0.04) and a shorter duration of hospital stay (P=0.001). Late parenteral nutrition was also associated with lower plasma levels of ?-glutamyltransferase and alkaline phosphatase than was early parenteral nutrition (P=0.001 and P=0.04, respectively), as well as higher levels of bilirubin (P=0.004) and C-reactive protein (P=0.006).Conclusions: In critically ill children, withholding parenteral nutrition for 1 week in the ICU was clinically superior to providing early parenteral nutrition. (Funded by the Flemish Agency for Innovation through Science and Technology and others; ClinicalTrials.gov number, NCT01536275.)

Comments:

Posted by Ravi Parikh, M.D., M.P.P. o March 23rd, 2016

During our intensive care unit rotations as residents, patient nutrition is a daily talking point. While it is easy to get lost in the details of the critical illnesses that bring patients to the ICU, we are regularly asked by attendings, nurses, and others, "how are we going to feed this patient?"

Indeed, nutrient deficiencies are associated with poor outcomes such as infection, prolonged intubation, and delayed recovery. Our natural inclination is to start feeding early - delaying nutrition can only be bad, right? In adults, this question was addressed in a 2011 randomized controlled trial published in NEJM. That study showed that patients receiving late parenteral (IV) nutrition had faster recovery while in the ICU and fewer complications when compared to those receiving early parenteral nutrition, without a difference in mortality. Based on that trial, early nutrition in critically ill adults may not be such a good thing. But does the same effect hold in children, who are growing and whose nutritional requirements per kilogram are greater than those of adults?

In this week's issue of NEJM, Fivez et al., the same group that published the 2011 trial, report the results of a multi-center randomized controlled trial that attempts to answer this question. Investigators enrolled children admitted to a participating pediatric ICU (PICU) and deemed at risk for nutritional deficiency according to the STRONGKids nutritional screening tool and whose expected PICU stay was >24 hours. Children who had been readmitted or who were premature newborns were excluded. From 2012-2015, 1440 of 7519 children screened were randomized to receive either early parenteral nutrition (the standard of care), initiated within 24 hours after PICU admission or late parenteral nutrition, starting on day 8 of PICU admission. In both groups, enteral nutrition - generally via nasogastric tube - was initiated early per local guidelines.

The investigators found that children (median age 1.2 years old) receiving early parenteral nutrition had nearly 8% more new infections ($p<0.001$) - usually bloodstream or airway infections - and a 2.7-day longer PICU length of stay ($p=0.002$) than children receiving late parenteral nutrition. These effects were more pronounced among children at higher risk of nutritional deficiency on admission. In an analysis of secondary outcomes, death, readmission within 48 hours, and serious adverse events rates were similar in the two groups. Interestingly, late parental nutrition reduced the length of mechanical ventilation and the odds of renal replacement therapy - two markers of poor prognostic outcomes in ICU patients. Importantly, the impact of late parenteral nutrition was consistent across diagnoses, illness severity, centers, and age of the child.

Thus, the findings reported by Fivez et al. provide evidence against the use of early parenteral nutrition in critically ill children admitted to the PICU. These results are likely to change practice regarding the timing of initiation of parenteral nutrition in children. However, the study doesn't tell us whether early enteral nutrition is harmful, and additional studies should investigate this question. In the accompanying editorial, Nilesh Mehta, Director of Critical Care Nutrition at Boston Children's Hospital, rightly notes that "the presupposition that a uniform approach would apply to all [children] is too simplistic." While the results of the Fivez et al. study may lead to recalibration of when parenteral nutrition is initiated, prescription of nutrition in children must be individualized to their condition, expected nutritional deficiency, and other important variables.

2. Asthma control not associated with vitamin D deficiency: A single-center retrospective study in Saudi Arabia.

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Introduction:

Asthma is the most common chronic disease among children worldwide, and the WHO estimates that 235 million people have asthma . Asthma is not only a public health problem for high-income countries. Indeed, more than 80% of asthma-related deaths occur in low- and lower-middle-income countries . The data on asthma prevalence in pediatric age group is still lacking in Saudi Arabia. However, there is a study done in 1985 on 2,123 school-age children, which showed a prevalence of 8%. Another one included 1,008 children and showed increased in prevalence up to 23% in 1995. Asthma exacerbations are defined as acute or sub-acute worsening in control of symptoms that necessitates a visit to a healthcare provider or requires systemic corticosteroids treatment as it may cause severe distress or risk to health of patient. Asthma control is determined by the symptoms of asthma. Asthma control is classified according to Global Initiative for Asthma (GINA) guidelines to: well controlled, partially controlled, and uncontrolled asthma . GINA developed a symptom score that consists of the presence or absence of four symptoms during the last four weeks . Vitamin D deficiency is another major health problem. Many studies have shown some association of vitamin D deficiency with cancer, cardiovascular disease and type 1 DM . In Saudi Arabia, a study performed in 2 large commercial centers in the capital city where participants Background: Asthma is one of the most common pulmonary diseases in Saudi Arabia with estimated prevalence of 24%. It has been found that almost half of Saudi asthmatics suffer from vitamin D deficiency, which is another common health problem in Saudi Arabia. The association between asthma control and vitamin D level, however, is controversial. The objectives were to estimate the prevalence of vitamin D deficiency among asthmatic patients in Saudi Arabia and to evaluate the association between vitamin D level and asthma control. Methods: They conducted a retrospective cohort study including all asthmatic patients presenting to the outpatient clinic in the period from 2014 to 2015 at a tertiary care center in the Western region of Saudi Arabia. Asthma control score was assessed using Global Initiative for Asthma guidelines (GINA) and vitamin D measurements were recorded. Results: 194 asthmatics were included in the study. 41 (21.7%) of the subjects had uncontrolled asthma while 148 (78.3%) had controlled asthma. Vitamin D was deficient in 101 (52.1%) of the population. The mean vitamin D level for controlled and uncontrolled asthmatics was 53.4 and 51.5, respectively, which is not significantly different (p value 0.657). Surprisingly, 71.6% of our asthmatic populations were males. On the other hand, vitamin D deficiency was more common in females (P= 0.019). Conclusion: Vitamin D deficiency is common among pediatric asthmatic patients in Saudi Arabia. Our study suggests that there is no significant association between asthma control and vitamin D level.

Comments:

Vitamin D deficiency is blamed for exacerbation and pathogenesis of disorders especially related to lifestyle. There are many studies depicting advantages of supplementation of Vitamin D in disease improvements or normal levels associated with good outcome. However, this study has clearly shown that vitamin D levels do not correlate with severity of asthma control. Probably, hype of supplementation 0f Vitamin D is not required in asthma. Will similar studies in future show that hype created around Vitamin D is true or false?

3. Comparison of propofol and ketamine induced anatomical upper airway changes in children at magnetic resonance imaging.

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Background:

Children are susceptible to airway obstruction with sedative agents because of smaller dimensions of their airways. The aim of our study was to localize and compare propofol versus ketamine induced morphologic upper airway changes in children using the MRI.

Patients and methods: 44 children with ASA physical status class I or II, aged 1-4 years, scheduled for elective MRI of the head were enrolled into this study. Each patient was randomly allocated to either propofol (Group P) or ketamine (Group K) groups. T1 weighted axial slices were used to measure the minimal anterior posterior and transverse diameters of the pharynx at the level of either the dorsum of the tongue or at the level of the soft palate and measurements were compared between the groups.

Results:

There were no significant differences among the two groups with respect to age, weight or gender. The cross-sectional area was smallest at the level of soft palate in 32 (72.7 %) children and smallest at the level of tongue in 12 (27.3 %) children. The groups did not differ with regard to the place of the narrowest level, the anteroposterior diameter, the transverse diameter and area of the narrowest sites.

Conclusion:

The results suggest that the patients in either group did not differ with regard to the place of the narrowest level, the anteroposterior and transverse diameters and area of the narrowest site of their upper airways. However, tongue was shown to become an important cause of impaired airway patency in anesthetized children.

Comments:

Occasional deaths have occurred in past while giving sedation before minor procedures. The study done had not found significant problem with either agent. However, the position of tongue seems to be important factor for morbidity. The care must be taken while supporting tongue structure during and after sedation.