Nutrition 62 (2019) 61–62

Contents lists available at ScienceDirect

Nutrition

journal homepage: www.nutritionjrnl.com

Editorial

Nutrition in the ICU: Foreword from the Editors

This special issue of *Nutrition* brings both breadth and depth to selected topics on nutrition therapy in critical care. Current meta-analyses, reviews, and original articles are brought togehter in an effort to provide the most up to date, well-considered information available on essential themes in critical care nutrition. Highlighted topics, such as the role of lipids and specifically enteral ω-3 polyunsaturated fatty acids (PUFAs), supplementation of vitamins C and D, use of parenteral nutrition (PN) guided by indirect calorimetry (IC) in various clinical conditions, and the most current knowledge on microbiota and probiotics in the critically ill have been extensively evaluated.

A systematic review by Simoes Golucci including 29 studies [1] confirms that the lipid profile is modified in most patients with sepsis. The more severe the inflammation, the more pronounced the decreases in low high-density lipoprotein (HDL), total cholesterol, and low-density lipoprotein concentrations. In addition, hypertriacylglycerolmia was also associated with systemic inflammation and infection. Of all the lipid parameters, high-density lipoprotein appears to be an accurate marker of inflammation in the critically ill and should be used more in clinical practice.

To date, enteral nutrition (EN) enriched with fish oils remains controversial in critical care. In a systematic review of the literature and meta-analysis, Koekkoek et al. [2] analyze the effects of enteral ω-3 PUFA supplementation in various critical conditions. Interestingly, only those patients with acute respiratory distress syndrome showed a significant improvement in survival, intensive care unit (ICU) length of stay, and duration of mechanical ventilation. Nonetheless, trauma or septic patients pooled in this meta-analysis did not show any benefit with ω-3 PUFA supplementation.

Acute respiratory distress syndrome is the topic of a meta-analysis by Langlois et al. [3] regarding the administration of fish oils in patients with respiratory failure. After aggregating 12 randomized controlled trials (RCTs), the authors confirmed previous findings and conclude that ω-3 PUFAs in enteral immunomodulatory diets might be associated with an improvement in the ratio of arterial oxygen partial pressure to fractional inspired oxygen.

Recent studies of vitamin therapy suggest an association between vitamin D deficiency and mortality. However, according to the most current evidence presented by Langlois et al., [4] vitamin D replacement should be reserved only for very severely depleted patients, although the evidence for vitamin D supplementation has yet to be confirmed. In this article, the authors stress the complex biological interactions regulating vitamin D values in healthy individuals and ICU patients. Currently, vitamin C seems to be the most promising micronutrient concerning improvement of survival in the critically ill.

In this special issue, Langlois and Lamontagne [5] summarize recent findings on experimental animal research, observational studies, and prospective clinical trials. Concerning vitamin C supplementation, these studies have shown benefits on clinical outcomes, although a recent systematic review found no clinical benefits after supplementation of low-dose vitamin C. These results could be attributed to inadequate or suboptimal repletion strategies and support future research with high-dose vitamin C supplementation.

In their contribution, Berger and Pichard [6] review PN in the ICU over recent years and conclude that it is as safe as EN, but the real danger in medical nutrition therapy is over- or underfeeding. A wrong prescription may explain most of the complications observed with one or both of the routes based on inaccurate predictive equations. This has been confirmed in another review by Rattanachaiwong and Singer [7], which analyzes the advantages and pitfalls of predictive equations in comparison to IC evaluation. Inaccuracy can reach >50% of the prescriptions regardless of which equation is used, except in the center where the equation was devised, making clinicians more cautious about the use of equations in the elaboration of the energy prescription. In a very comprehensive review, Dickerson [8] suggests a hypocaloric high-protein diet for obese patients, although current evidence supporting this recommendation is still poor and mostly based on observational and retrospective studies. Moreover, it seems that obese ICU patients also should be more closely evaluated using IC and urinary urea nitrogen measurements.

Over the past 2 decades, different metabolic changes associated with critical illness, particularly stress hyperglycemia, have been extensively evaluated. In this issue, Lheureux et al. [9] summarize the recent evidence on mechanisms underlying stress hyperglycemia, domains of dysglycemia, and current recommendations on glucose control and monitoring in the ICU.

In their paper, McClave et al. [10] describe different strategies aimed at modulating and promoting a healthy gut microbiome in the critically ill. Among strategies to support the intestinal microbiome in critical illness, early enteral nutrition combined with soluble fermentable fiber, probiotics, fecal transplantation, and the provision of blenderized whole food formulas are discussed.

Meanwhile, Davison and Wischmeyer [11] examine in depth the most current evidence on probiotics and synbiotics in critical care. In this article, the authors introduce the concept of dysbiosis, discuss the mechanistic role of probiotics and synbiotics and

https://doi.org/10.1016/j.nut.2018.12.010

mechanisms of protection from infections, as well as the most current clinical evidence on probiotics in the critically ill. Finally, the authors conclude that probiotic and synbiotic therapies should be targeted with the aim of restoring "health-promoting" microbes and advocate an urgent well-designed multicenter RCT of probiotic and synbiotic therapy in the critical care setting.

Finally, Elamin et al. [12], in an RCT, evaluated the effects of enteral bovine colostrum administration on intestinal permeability assessed by plasma endotoxin and zonulin levels. In this clinical trial, the authors found that intestinal permeability markers significantly decrease in the colostrum group, showing that this strategy may have beneficial effects on intestinal permeability in enterally fed patients.

References

[1] Simoes Golucci APB, Lima Marson FA, Ribeiro AF, Nogueira RJN. Lipid profile associated with the amatory response syndrome and sepsis in critically ill patients. Nutrition 2018.
[2] Koekkoek WAC, Panteleon V, Van Zanten ARH. Current evidence on omega-3 fatty acids in enteral nutrition in the critically ill: A systematic review and meta-analysis. Nutrition 2018.
[3] Langlois PL, D'Aragon F, Hardy G, Manzanares W. Omega-3 polyunsaturated fatty acids in critically ill patients with acute respiratory distress syndrome: A systematic review and meta-analysis. Nutrition 2018.
[4] Langlois PL, D'Aragon F, Manzaranes W. Vit D in the ICU: More sun for the critically ill patients? Nutrition 2018.
[5] Langlois PL, Lamontage F. Vitamin C for the critically ills: Is the evidence strong enough? Nutrition 2018.
[6] Berger MM, Pichard C. Parenteral nutrition in the ICU: Lessons learned over the past few years. Nutrition 2018.
[7] Rattanachaiwong S. Singer P Should we calculate or measure energy expenditure? Practical aspects in the ICU. Nutrition 2018.
[8] Dickerson RN. Metabolic support challenges with obesity during critical illness. Nutrition 2018.
[9] Lheureux O, Prevedello D, Preiser JC. Update on glucose in critical care. Nutrition 2018.
[10] McClave SA, Martindale R. Why do current strategies for optimal nutritional therapy neglect the microbiome? Nutrition 2018.
[11] Davison JM, Wischmeyer PE. Probiotic and symbiotic therapy in the critically ill. Nutrition 2018.
[12] Elamin G, Ardehali SH, Baghestani AR, Shariatpanahi ZV. Effects of early enteral bovine colostrum supplementation on intestinal permeability in critically ill patients: A randomized, double blind, placebo-controlled study. Nutrition 2018.

William Manzanares M.D., Ph.D.
Department of Critical Care, University Hospital, Faculty of Medicine, Universidad de la República. Montevideo, Uruguay

Pierre Singer M.D.
Department of General Intensive Care, Rabin Medical Center, Petah Tikva and Sackler School of Medicine, Tel Aviv University, Israel