Enferm Intensiva. 2018;29(2):97–99

Enfermería Intensiva

www.elsevier.es/ei

COMMENTS TO RESEARCH ARTICLES

Early nutritional support for critical patients with invasive ventilatory support and vasopressor treatment☆

Soporte nutricional precoz en el paciente crítico con soporte ventilatorio invasivo y tratamiento vasopresor

Reignier J, Boisramé-Helms J, Brisard L, Lascarrou JB, Ait Hssain A, Anguel N, et al. Enteral versus parenteral early nutrition in ventilated adults with shock: A randomised, controlled, multicentre, open-label, parallel-group study (NUTRIREA-2). Lancet. 2018;391:133–143.

Abstract

Background: Whether the route of early feeding affects outcomes of patients with severe critical illnesses is controversial. We hypothesised that outcomes were better with early first-line enteral nutrition than with early first-line parenteral nutrition.

Methods: In this randomised, controlled, multicentre, open-label, parallel-group study (NUTRIREA-2 trial) done at 44 French intensive-care units (ICUs), adults (18 years or older) receiving invasive mechanical ventilation and vasopressor support for shock were randomly assigned (1:1) to either parenteral nutrition or enteral nutrition, both targeting normocaloric goals (20–25 kcal/kg per day), within 24 h after intubation. Randomisation was stratified by centre using permutation blocks of variable sizes. Given that route of nutrition cannot be masked, blinding of the physicians and nurses was not feasible. Patients receiving parenteral nutrition could be switched to enteral nutrition after at least 72 h in the event of shock resolution (no vasopressor support for 24 consecutive hours and arterial lactate <2 mmol/L). The primary endpoint was mortality on day 28 after randomisation in the intention-to-treat-population. This study is registered with ClinicalTrials.gov, number NCT01802099.

Findings: After the second interim analysis, the independent Data Safety and Monitoring Board deemed that completing patient enrolment was unlikely to significantly change the results of the trial and recommended stopping patient recruitment. Between March 22, 2013, and June 30, 2015, 2410 patients were enrolled and randomly assigned; 1202 to the enteral group and 1208 to the parenteral group. By day 28, 443 (37%) of 1202 patients in the enteral group and 422 (35%) of 1208 patients in the parenteral group had died (absolute difference estimate 2.0%; [95% CI −1.9 to 5.8]; $p = 0.33$). Cumulative incidence of patients with ICU-acquired infections did not differ between the enteral group (173 [14%]) and the parenteral group (194 [16%]; hazard ratio [HR] 0.89 [95% CI 0.72–1.09]; $p = 0.25$). Compared with the parenteral group, the enteral group had higher cumulative incidences of patients with vomiting (406 [34%] vs 246 [20%]; HR 1.89 [1.62–2.20]; $p < 0.0001$), diarrhoea (432 [36%] vs 393 [33%]; 1.20 [1.05–1.37]; $p = 0.009$), bowel ischaemia (19 [2%] vs five [<1%]; 3.84 [1.43–10.3]; $p = 0.007$), and acute colonic pseudo-obstruction (11 [1%] vs three [<1%]; 3.7 [1.03–13.2]; $p = 0.04$).

Interpretation: In critically ill adults with shock, early isocaloric enteral nutrition did not reduce mortality or the risk of secondary infections but was associated with a greater risk of digestive complications compared with early isocaloric parenteral nutrition.

Comments

Current literature puts forward contradictory results as to which is the best route for nutritional support for critical patients in a state of shock with invasive ventilator support.[1,2] The authors present a study aimed at seeking the route with the highest proven benefits in this type of patient using mortality as the principle variable at 28 and 90 days

DOI of original article: https://doi.org/10.1016/j.enfi.2018.04.002

☆ Please cite this article as: Rodríguez Delgado ME. Soporte nutricional precoz en el paciente crítico con soporte ventilatorio invasivo y tratamiento vasopresor. Enferm Intensiva. 2018;29:97–99.

2529-9840/

after initiation of the nutritional support. To do this, they designed a multicentric, controlled, randomised, unblinded clinical trial, with 2 groups. Early enteral nutritional support was given to the first group and parenteral therapy was given to the second group, with an isocaloric objective for both groups.

A critical reading of the article following the Spanish Critical Appraisal Skills Programme (CASPe) model was made.

Validity of trial outcome

The study was aimed at a clearly defined issue. Its objective was to investigate whether early enteral nutritional support after 24 h of intubation had a beneficial clinical effect compared with early parenteral nutrition, in a population study defined by chronic patients in a state of shock, with invasive ventilator support and vasopressor treatment.

Patient assignation was made randomly (1:1) to the different treatment groups (early enteral or parenteral treatment), stratified by centres using variable sized permuted blocks. The researchers did not have access to the randomly assigned list.

Patient follow-up included in the study was complete, although recruitment of patients was interrupted after the second intermediate analysis due to the fact no significant differences were found between both groups, and it was improbable that the increase in size modified the results obtained. Furthermore, the patients were analysed in the group to which they were initially assigned.

Methodologically it was not possible to keep the study blind due to the nature of the intervention.

With regards to the characteristics of the groups studied, they were similar to the beginning of the trial, with no significant differences being found regarding sample size, socio-demographic characteristics, prognostic assessors of severity and mortality, anthropometrics and pre-existing disease on admittance, among others. The article did not specify whether the groups were treated analogously outside the study.

Results

With regard to the effects of treatment, there was no statistical significance except that regarding gastrointestinal complications. ''Enteral nutrition'' or ''parenteral nutrition'' intervention did not show any statistically significant differences regarding hospital mortality after 28 days in the dependent variable. Neither were there any statistically significant differences in frequency of appearance of infectious complications, multi-organ failure, ICU stay and hospital stay or associated hospital morality after 90 days.

Despite the use of normocaloric enteral nutrition, it was associated with a lower caloric-protein intake and higher incidence of hypoglycaemia and gastrointestinal complications.

No statistical significance could be demonstrated between the variables studied when addressing the precision of the studied outcome.

Applicability of results

The results obtained in this research may be applied to any medium. All clinically important patient results were taken into consideration. In addition, we observed that the benefit obtained justified the associated risks and costs since intervention itself was not an added risk situation to the patient's clinical situation.

Current directives support early enteral nutrition in the critical patient 24–48 h after admittance to the ICU.[3–5] If patients are in shock and with invasive ventilator support, this decision may still be controversial due to the potential risk of associated intestinal ischaemia. The results of this study show a lower caloric intake and higher incidence of accumulated intestinal ischaemia in enteral therapy (19%) compared with parenteral (1%) therapy, and the appearance of acute colonic pseudo obstruction (11 vs 3), together with an increase in gastrointestinal (vomiting) complications, and hypoglycaemia, and it was therefore better to delay enteral therapy until a more stable status was achieved.

Based on results obtained, it has not been possible to demonstrate any clinical benefit associated with early initiation of enteral nutrition in critically ill patients on ventilatory and vasoactive support, with recommendation to initiate this once stability has been achieved. However, early enteral nutrition was administered with an isocalororic aim from the start, rather than progressively, as recommended in current directives.[6,7]

A further aspect to be considered is the fact that after random assignation and distribution of people into the different treatment groups (enteral or parenteral), those who had been included in the parenteral group could be changed to the enteral group after 72 h if the shock status had been resolved, but a similar procedure was not possible with the enteral group, and this generated a bias during the execution of the study. The conclusions are modest and limited and do not guarantee an optimisation in the quality of nutritional support in the ICU.

The particularities presented by a critical state due to its variability and lability requires research studies to provide greater solidity of results and minimum bias. It would also be necessary to consider other elemental aspects such as nutritional state prior to interventions, including the type of formula used and its composition, the aim of protein and caloric provision,[8] particularly in patients with severe stress, together with the type of support provided (caloric or metabolic).

References

1. Brisard L, Le Gouge A, Dupont H, Asfar P, Sirodot M, Piton G, et al. Impact of early enteral versus parenteral nutrition on mortality in patients requiring mechanical ventilation and catecholamines: study protocol for a randomized controlled trial (NUTRIREA-2). Trials. 2014;15:507.
2. Doig GS, Simpson F, Sweetman EA, Finfer SR, Cooper DJ, Heighes PT, et al., Early PN Investigators of the ANZICS Clinical Trials Group. Early parenteral nutrition in critically ill patients with short-term relative contraindications to early enteral nutrition: a randomized controlled trial. JAMA. 2013;309:2130–8.
3. Hoffer JL, Bistrian BR. What is the best nutritional support for critically ill patients? Hepatobiliary Surg Nutr. 2014;3:172–4.

4. Taylor BE, McClave SA, Martindale RG, Warren MM, Johnson DR, Braunschweig C, et al., Society of Critical Care Medicine; American Society of Parenteral and Enteral Nutrition. Guidelines for the Provision and Assessment of Nutrition Support Therapy in the Adult Critically Ill Patient: Society of Critical Care Medicine (SCCM) and American Society for Parenteral and Enteral Nutrition (ASPEN). Crit Care Med. 2016;44:390–438.
5. Heyland DK, Dhaliwal R, Drover JW, Gramlich L, Dodek P. Canadian clinical practice guidelines for nutrition support in mechanically ventilated, critically ill adult patients. JPEN J Parenter Enteral Nutr. 2003;27:355–73.
6. Arabi YM, Aldawood AS, Haddad SH, Al-Dorzi HM, Tamim HM, Jones G, et al., PermiT Trial Group. Permissive underfeeding or standard enteral feeding in critically ill adults. N Engl J Med. 2015;372:2398–408.
7. Harvey SE, Parrott F, Harrison DA, Sadique MZ, Grieve RD, Canter RR, et al. A multicentre, randomised controlled trial comparing the clinical effectiveness and cost-effectiveness of early nutritional support via the parenteral versus the enteral route in critically ill patients (CALORIES). Health Technol Assess. 2016;20:1–144.
8. Savino P, Patiño JF. Metabolismo y nutrición del paciente en estado crítico. Rev Colomb Cir. 2016;31:108–27.

M.E. Rodríguez Delgado (RN)
Unidad de Cuidados Intensivos, Hospital de Motril, Motril, Granada, Spain
E-mail address: esther._rd@hotmail.com