

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.JournalofSurgicalResearch.com

Association for Academic Surgery

Periprocedural nutrition in the intensive care unit: a pilot study



Daniel Dante Yeh, MD,* Catrina Cropano, MSc,
Sadeq A. Quraishi, MD, MH, MMSc, Eva Fuentes, MD,
Haytham Kaafarani, MD, MPH, Jarone Lee, MD, MPH,
and George Velmahos, MD, PhD

Department of Surgery, Division of Trauma, Emergency Surgery, and Surgical Critical Care, Massachusetts General Hospital, Boston, Massachusetts

ARTICLE INFO

Article history:

Received 7 January 2015

Received in revised form

11 June 2015

Accepted 17 June 2015

Available online 23 June 2015

Keywords:

Compensatory feedings

Perioperative nutrition

Caloric debt

Complications

Malnutrition

Tracheostomy

ABSTRACT

Background: Enteral nutrition (EN) delivery in the surgical intensive care unit (ICU) is often suboptimal as it is commonly interrupted for procedures. We hypothesized that continuing perioperative nutrition or providing compensatory nutrition would improve caloric delivery without increasing morbidity.

Materials and methods: We enrolled 10 adult surgical ICU patients receiving EN who were scheduled for elective bedside percutaneous tracheostomy. In these patients (fed group), either perioperative EN was maintained or compensatory nutrition was provided. We compared the amount of calories delivered, caloric deficits, and the rate of complications of these patients with those of 22 contemporary controls undergoing tracheostomy while adhering to the traditional American Society of Anesthesiology *nil per os* guidelines (unfed group). We defined caloric deficit as the difference between prescribed calories and actual delivered calories.

Results: There was no difference in demographic characteristics between the two groups. On the day of procedure, the fed group had higher median delivered calories (1706 kcal; interquartile range [IQR], 1481–2009 versus 588 kcal; IQR, 353–943; $P < 0.0001$) and received a higher percentage of prescribed calories (92%; IQR, 82%–97% versus 34%; IQR, 24%–51%; $P < 0.0001$). Median caloric deficit on the day of the procedure was significantly lower in the fed group (175 kcal; IQR, 49–340 versus 1133 kcal; IQR, 660–1365; $P < 0.0001$). There were no differences in total overall ICU complications per patient, gastrointestinal complications on the day of procedure, or total infectious complications per patient between the two groups.

Conclusions: In our pilot study, perioperative and compensatory nutrition resulted in higher caloric delivery and was not associated with increased morbidity.

© 2015 Elsevier Inc. All rights reserved.

* Corresponding author. Department of Surgery, Division of Trauma, Emergency Surgery, and Surgical Critical Care, Massachusetts General Hospital, 165 Cambridge St. #810, Boston, MA 02114. Tel.: +1 617 724 8604; fax: +1 617 726 9121.

E-mail address: dyeh2@partners.org (D.D. Yeh).

0022-4804/\$ – see front matter © 2015 Elsevier Inc. All rights reserved.

<http://dx.doi.org/10.1016/j.jss.2015.06.039>

1. Introduction

Early, adequate nutrition is recognized as an important component of critical care and is believed to improve clinical outcomes. Multiple professional societies recommend initiation of nutrition therapy within 24–72 h of admission to the intensive care unit (ICU) [1–3]. Yet, actual calorie delivery averages less than 60% of what is prescribed in most critically ill patients [4,5]. Low initiation rates, underprescription (in comparison with actual caloric requirements), and frequent interruptions without compensation are common reasons for inadequate caloric delivery. Temporary enteral nutrition (EN) cessation occurs in as many as 68%–83% of surgical patients admitted to the ICU [6,7]. This accounts for up to 32% of potential feeding time [7–11]. The most common reasons to interrupt EN in the surgical ICU are for procedures [6,9,11], presumably to prevent aspiration events or to allow for gastric emptying. However, these interruptions can lead to significant caloric and protein deficiencies, especially if the patient undergoes repeated procedures or endures delays or cancellations. For example, almost one in four of these procedures is postponed beyond the originally scheduled day of procedure [12]. Indeed, a single episode of EN interruption for a clinical procedure can adversely affect overall nutritional adequacy and result in greater cumulative macronutrient deficit. This has been associated with prolonged ICU and hospital length of stay (LOS) in surgical ICU patients [6].

In elective surgery for patients without a preexisting controlled airway, the rationale for *nil per os* (NPO) is to prevent regurgitation and aspiration of gastric contents during anesthetic induction. For inpatients undergoing operative procedures, the standard is often to order “NPO after midnight.” However, for mechanically intubated patients already receiving EN and scheduled to undergo procedures in the supine position, this rationale does not apply. For these patients, EN may be continued up until or during the procedure; however, even if interrupted, additional nutrition may be given in the immediate postoperative setting to compensate for lost calories. Although the practice of reducing the duration of NPO or providing compensatory nutrition is already being practiced at some centers, there is few published literature on this topic. Furthermore, the existing literature describes using postpyloric or jejunostomy feeding tubes to deliver EN. It is currently unknown whether gastric perioperative feeding is equally safe and feasible and whether this practice can be extended beyond the burn and trauma population.

In this pilot study, we hypothesized that for surgical ICU patients undergoing elective tracheostomy, continuing perioperative nutrition or providing compensatory nutrition would improve caloric delivery on the day of procedure without increasing morbidity.

2. Methods

This study was approved by our local institutional review board. We prospectively enrolled adult (age ≥ 18 y) surgical ICU patients currently receiving EN who were scheduled for elective tracheostomy between July, 2012 and May, 2014.

Demographic data collected included age, sex, body mass index (BMI), acute physiology and chronic health evaluation (APACHE II) score, and type of surgical admission. Outcomes data collected included ventilator days, ICU LOS, and hospital LOS. Nutritional data collected included the amount of calories prescribed and the amount of calories received on the day of the procedure. Cumulative deficits were calculated from ICU admission until permanent progression to oral intake, transfer out of the ICU, or death, for a maximum of 14 d. The term “medical” was applied to primary surgical patients admitted to the ICU for a nonsurgical reason (e.g., rapid atrial fibrillation) or to a primary medical patient boarding in the surgical ICU. Perioperative EN was defined as continuing tube feeds up to (and sometimes during) operative procedures, whereas compensatory nutrition was defined as a temporary postoperative increase in the hourly EN rate to compensate for interrupted EN. For example, if EN was interrupted for 4 h and the hourly goal rate was 50 mL/h, then the patient missed out on 200 mL of nutrition. Once EN was resumed, the nutritional deficit was gradually replaced over the remaining hours of the day until midnight. In this example, if there were 10 h remaining in the day, then the hourly rate would be increased to 70 mL/h so as to provide an extra 200 mL over the remaining 10 h. Caloric deficit was calculated as the difference between the prescribed calories and the amount of calories actually delivered on that day. Cumulative ICU caloric deficit was the sum of all daily caloric deficits during ICU stay. We compared this cohort with contemporary controls that underwent tracheostomy while adhering to the traditional American Society of Anesthesiology NPO guidelines [13] and did not receive postoperative compensatory nutrition. Although strictly speaking, none of the patients were taking nutrition *per os* because they were all intubated, we applied the term NPO to mean “not receiving EN.” Only periods of NPO lasting ≥ 1 h were considered.

Our primary outcome was the proportion of prescribed calories received on the day of the scheduled procedure(s) between patient groups. Based on historical data, we assumed that patients in the intervention group would receive an average of 80% of their prescribed calories, whereas those in the control group would receive an average of 40% of prescribed calories. To detect this difference between groups, assuming a common standard deviation of 30% and alpha set at 5% with a power of 80%, would require a minimum of nine patients in each group. Our secondary outcome was the rate of complications (cardiovascular, respiratory, gastrointestinal [GI], and infectious) between the two patient groups. Cardiovascular complications included new-onset atrial fibrillation, myocardial infarction, and congestive heart failure. GI complications included vomiting, abdominal distension requiring cessation of EN, and diarrhea. Infectious complications included pneumonia, urinary tract infection, bacteremia, and surgical site infection. Outcomes in patients receiving perioperative and/or compensatory feedings (fed) were compared with those not receiving them (unfed) using Pearson chi-squared and Mann–Whitney test for proportions and medians, respectively. All tests were two-sided, and $P < 0.05$ was considered significant. Data analysis was performed using SPSS Statistics 21.0 software (SPSS Release 21.0; IBM Corp., Armonk, NY).

Download English Version:

<https://daneshyari.com/en/article/4299712>

Download Persian Version:

<https://daneshyari.com/article/4299712>

[Daneshyari.com](https://daneshyari.com)