Notice to CE enrollees:
A closed-book, multiple-choice examination following this article tests your understanding of the following objectives:

1. Describe the methods of the study.
2. Identify the incidence of aspiration during repositioning of patients.
3. Discuss the results of the study.

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Background Withholding enteral feedings during repositioning is based on tradition, but available evidence does not support this practice. Although research indicates that withholding of enteral feedings during repositioning contributes to undernourishment, the relationship between continuing enteral feedings during repositioning and the incidence of aspiration has not been determined.

Objective To determine the feasibility of a study designed to explore differences in the incidence of aspiration when enteral feedings are withheld or continued during repositioning.

Methods A crossover design with a convenience sample from 3 medical and 3 surgical intensive care units was used. Two sample sets of subglottal secretions were collected from each patient, once when enteral feedings were withheld during repositioning and once when enteral feedings were continued during the change in position. The incidence of aspiration was assessed by testing specimens for the presence of pepsin.

Results Subglottal secretions were collected from 23 patients (n = 46 with crossover design). Aspiration during repositioning occurred in 2 patients when enteral feedings were withheld and in 2 patients when feedings were continued during repositioning. According to the McNemar test, the incidence of aspiration when enteral feedings were withheld did not differ significantly from the incidence when the feedings were continued during repositioning (P = .88).

Conclusions A research protocol to directly explore the relationship between the incidence of aspiration and withholding or continuing enteral feedings during repositioning is feasible. (American Journal of Critical Care. 2015;24:258-262)
The purpose of our study was to obtain preliminary data and explore the feasibility of the study design. The ultimate goal is to develop evidence-based clinical policies and procedures to standardize care and reflect best practice.

Methods

Because currently both continuing and withholding enteral feedings occur in routine practice, a crossover design was used. This design made any deviation from standard practice unnecessary and allowed each patient to serve as his or her own control, optimizing both patient safety and the strength of the study. Patients were included in the study if they were 18 years or older, admitted to a medical or surgical intensive care unit, endotracheally intubated and treated with mechanical ventilation, and receiving enteral feedings at ordered goal volumes or at a rate of at least 50 mL/h. Patients were excluded if routine subglottal suctioning was contraindicated, backrest elevation was less than 30º, gastric residual volumes were greater than 200 mL, or enteral feedings were delivered via postpyloric or surgical jejunostomy tube. The study was approved by the appropriate institutional review board.

Patients were screened by review of the daily census. Data were collected from all patients who met the inclusion criteria. Randomization in a crossover design is achieved by counterbalancing the treatment effects such that their order is systematically varied. In this study, patients were randomly assigned to the withhold-continue or the continue-withhold sequence by using a random number table. Specimens were collected by 3 of the study investigators (J.D., M.L., S.O.). Before data collection, interrater reliability between all data collectors was verified. At the time of data collection, the angle of the head-of-bed elevation was measured by using protractors and was recorded. After this measurement, gastric residual volume was determined. Subglottal specimens were obtained with a 14F suction catheter attached to a sputum trap. Two samples were obtained during each collection. The first sample was obtained before repositioning; the second sample, after repositioning. The first sample was used as a control for baseline aspiration. The second set of specimens was collected at the next position change. All specimens were pipetted into tubes, placed on ice, and immediately transported for storage in a -80ºC freezer until data collection was completed. All specimens were then transported together on dry ice to a research laboratory for analysis.

Specimens were tested for pepsin by using an enzyme-linked immunoassay and were analyzed for differences in the incidence of aspiration between times when enteral feedings were withheld during repositioning and times when enteral feedings were continued during repositioning. The data were analyzed by using the McNemar test.

Results

A total of 23 patients (n = 46 with the crossover design) were enrolled in the study, and samples were collected between July 20, 2012, and September 10, 2012. Of the 23 patients, 13 were admitted to medical intensive care units and 10 were admitted to surgical intensive care units. Patients were 31 years to 91 years old (median, 64 years).

Enteral feeding rates were 30 mL/h to 75 mL/h (mean; 52 mL/h; SD, 12.3 mL/h). Feeding rates did not change between the time of collection of the first and second set of subglottal specimens. Gastric residual volumes were 0 mL to 180 mL (mean, 17.4 mL; SD, 40.2 mL). Gastric residual volumes were less

Nursing practice varies regarding continuation or withholding of enteral feedings during repositioning.
Aspiration occurred in 4 instances, 2 when feedings were withheld, 2 when feedings were continued.

Discussion

Precautionary withholding of enteral feedings during repositioning of patients has been a longstanding practice. Despite recent evidence suggesting that such withholding should be avoided, the lack of direct research findings has contributed to marked variations in practice. Our results indicate the feasibility of a research protocol designed to directly explore the relationship between the withholding or continuing of enteral feedings during repositioning and the occurrence of aspiration. The ability of the research team to enroll the target sample of 23 patients within the study period suggests that obtaining a larger sample for future studies should not be difficult. Further, our findings show that the data collection procedures and instruments we used are appropriate and that a larger-scale study can be safely implemented.

The frequency of baseline aspiration has been reported to be as high as 70% to 88% in critically ill patients. Therefore, baseline aspiration must be accounted for in assessment of the occurrence of aspiration during repositioning. Collecting a sample before repositioning is an ideal method to control for baseline aspiration.

Conclusion

Precautionary withholding of enteral feedings during repositioning does not reduce the incidence of aspiration in critically ill patients. Our results show the logistic feasibility of conducting a larger scale study and indicate the minimal risk associated with this study design. The study findings will be used to support implementation of a larger-scale study. Other variables that were not fully described in our study, including how long the head of the bed was lowered at each point of data collection and level of sedation, should be further explored in larger, subsequent studies. Further research is needed to provide the definitive evidence necessary to support the development of policy and practice that will optimize the delivery of enteral feedings and minimize morbidity and mortality related both to undernourishment and aspiration in critically ill patients.

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For more about withholding nutrition, visit the Critical Care Nurse Web site, www.ccnonline.org, and read the article by Stewart, “Interruptions in Enteral Nutrition Delivery in Critically Ill Patients and Recommendations for Clinical Practice” (August 2014).
REFERENCES


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