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Assessment of perioperative nutrition practices and attitudes—A national survey of colorectal and GI surgical oncology programs

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ABSTRACT

Background: Implementation of evidence-based peri-operative nutrition in the U.S. is poorly described and hypothesized to be suboptimal. This study broadly describes practices and attitudes regarding nutrition screening/intervention in U.S. gastrointestinal and oncologic surgeons.
Methods: Nationwide nutritional practice survey of GI/Oncologic surgical faculty.
Results: Program response rates were 57% and 81% for colorectal and oncology fellowships, respectively. Only 38% had formal nutritional screening processes in place. Average estimated percent of patients malnourished, receiving nutritional screening, and receiving nutritional supplementation preoperatively were 28%, 43%, and 21%, respectively. University-affiliation ($p = 0.0371$) and a formal screening process ($p = 0.0312$) predicted higher preoperative nutritional screening rates. Controversy existed regarding routine use of perioperative immunonutrition, but strong consensus emerged that lack of awareness regarding positive data for immunonutrition impedes usage.
Conclusion: U.S. surgeons recognize importance of perioperative nutritional screening and benefits of basic nutrition therapy. However, limited formal nutrition screening programs currently exist indicating a significant need for implementation of nutrition screening and basic nutrition intervention. Further work on education, implementation and identifying clinical research needs for immunonutrition interventions is also vitally needed.
Summary: This study broadly describes nutritional practices and attitudes of gastrointestinal and oncologic surgeons across the U.S. Surgeons recognize both the importance of proper perioperative surgical nutritional support and the potential value to their practice in terms of outcomes, but this study confirms poor implementation of evidence-based nutrition practices in GI and oncologic surgery programs. This study describes a significant opportunity to capitalize on current favorable surgeon beliefs (and positive published data) regarding the benefit of perioperative nutrition to improve surgical nutrition practice and patient outcomes in the U.S.

1. Introduction

Historically-defining, diagnosing, and treating perioperative malnutrition has been challenging and poorly described. Despite these challenges, it is well-known that sub-optimal nutritional status is a strong independent predictor of poor postoperative outcomes.[1] Malnourished patients have a significantly higher postoperative morbidity, mortality, length-of-stay, readmission rate, and increased hospital costs, especially following major gastrointestinal (GI) and oncologic surgery.[2–4] Appropriate perioperative nutritional therapy has been shown to improve perioperative outcomes in GI/oncologic surgical patients, who often demonstrate the greatest risk of iatrogenic and baseline malnutrition (approximately 65%).[3,5] Strong recommendations from major societal guidelines endorsing preoperative nutrition optimization underscores the importance of appropriate perioperative nutrition practices.[6–8]

Published evidence in European centers suggests that 80% of surgeons are aware perioperative nutrition screening and intervention can reduce postoperative complications.[9] Despite this

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awareness, less than 20% perform preoperative nutrition screening when surveyed.[9] In the U.S., the practice of perioperative nutritional assessment and intervention is poorly described. Thus, an initial description of current U.S. practice and identification of potential areas for improvement are needed.

This study aims to provide an initial description of U.S. perioperative nutrition practice in colorectal and oncologic surgical populations, as this group tends to have the highest described perioperative nutrition risk.[3,5] Utilizing a survey derived and adapted for U.S. surgical practice from previously published European surgical nutrition studies,[9] the specific aims of this study are to: 1) Broadly describe U.S. perioperative nutritional practices and attitudes; 2) Ascertain current U.S. nutritional practices; and 3) Serve as a guide for evaluating local surgical nutritional practices and identify areas for future quality improvement initiatives.

2. Materials and methods

A 24 question survey (Supplemental Appendix 1) was developed from a consensus of key nutrition issues identified by strong recommendations of current nutrition clinical practice guidelines in conjunction with the NIH-supported Colorado Clinical & Translational Sciences Institute (CCTSI) Statistical Core (University of Colorado School of Medicine, Aurora, CO) and reviewed by members of the University of Colorado Interprofessional Nutrition Council to assess 3 major areas related to perioperative nutrition support: 1) Appraisal of local nutritional screening practices; 2) Assessment of nutritional supplementation practices; and 3) Attitudes towards nutrition practice improvement barriers and evidence.[6,10] The survey was piloted and revised with local GI and oncologic surgeons input to identify and reduce potential bias.

A total of 75 potential respondent programs were identified using the American Medical Association's Fellowship and Residency Electronic Interactive Database (FREIDA) by searching for 'Colon and Rectal' and 'Complex General Surgical Oncology' fellowship programs. We focused the study on these programs to provide a convenient and homogenous sample representative of GI surgery, where malnutrition is especially prominent. Moreover, within these programs, we limited surveys to faculty who performed more complex abdominal surgery (such as tumor resections and hepatopancreatobiliary surgery) as these patients are at the highest risk of perioperative malnutrition. The survey was administered to surgeons at their respective programs in September thru November of 2015 in a three-pronged, multi-modal format: phone interview, paper survey, or Web based survey (Survey Monkey® Palo Alto). The modality of communication was tailored to the preference of surgeons in order to maximize response rate, and programs were contacted a minimum of three times. The Colorado Multiple Intuitional Review Board (COMIRB) approved this study with exempt status.

Descriptive statistics were used to analyze aggregated survey results and are expressed as either absolute percentages or frequencies that indicate the percent of respondents who selected a given response. Multiple linear regression analysis was used to identify characteristics that explain estimated percentages of malnourished patients, patients who receive nutritional screening, and patients who receive nutritional supplementation prior to surgery. These characteristics were surgeon type (colorectal surgeon vs. surgical oncologist), annual facility procedural volume (high vs. low annual procedure volume using 400 surgical procedures per facility as a cutoff), university affiliation status (university-affiliated vs. non-university affiliated), and the presence of a formal nutrition screening process (formal screening process in place vs. no formal screening process in place). We hypothesized that surgical oncologists, high-volume centers, university-affiliation, and the presence of a formal screening process would all predict higher estimated percentages of malnourished patients, nutritional screening, and nutritional supplementation prior to surgery. A two-sided Fischer's exact test was used for comparison of categorical variables that related to attitudes and barriers between these same characteristics. Significance was set at a p-value of <0.05 for all analyses.

3. Results

3.1. Survey demographics

Overall, 48 fellowship programs and 54 individual respondents participated in the survey leading to a total program response rate of 64%. 57% of colorectal programs and 81% of surgical oncology programs in the U.S. participated. 61% and 37% of individual respondents were from colorectal and oncology fellowship programs, respectively. 81% and 77% of responding programs identified themselves as high-volume centers and university-affiliated, respectively.

3.2. Characterization of practice and nutritional screening

Our data reveals only 38% of fellowship programs utilize a formal preoperative nutritional screening process. The average estimated percent of patients that: were malnourished, received nutritional screening, and received nutritional supplementation prior to surgery were 28%, 43%, and 21% respectively. Multiple linear regression reveals only university affiliation (p-value $= 0.0371$, b $= 0.224$) and presence of a formal nutritional screening process (p-value $= 0.0312$, b $= 0.201$) predicted a higher use of preoperative nutrition screening.

Surgeons (85%) and dietitians (35%) were most often cited as the responsible party for nutritional screening (Fig. 1). Approximately 40% of respondents took a team approach to nutritional screening (i.e. more than one responsible party addressed nutritional status) while 54% had only one responsible individual.

In the 43% who received pre-operative nutrition screening, this was most often performed in the preoperative outpatient clinic (80%). Postoperatively, when nutrition screening was conducted, it occurred on the surgical ward 50% of the time and less often in the ICU (26%). When screening was performed, the majority (approximately 84%) of respondents were relatively split on either performing screening only prior to surgery or both before and after surgery (Fig. 2).

Clinical parameters, subjective measures, and laboratory values were the most frequent modalities used for nutritional screening. Clinical nutrition scoring tools and biometrical measurements were rarely employed (Fig. 3). Virtually all respondents used a multimodal (two or more screening modalities) approach to nutritional screening.

3.3. Description of nutritional supplementation practices

Respondents indicated nutritional supplements were only given in 21% of patients pre-operatively and 22% post-operative patients. When nutrition supplements were given it was most often given with equal frequency preoperatively in the outpatient clinic or postoperatively on the surgical ward (74% each) and far less often postoperatively in the ICU (41%) or preoperatively upon admission (20%). In rough proportions, one-fourth of respondents supplemented patients only preoperatively, half supplemented both pre- and postoperatively, and one-fourth supplemented only postoperatively (Fig. 2). Protein-containing supplements were the most common nutritional supplement utilized (81%). Only 24% used