CAS 2024
Resident Competition Abstracts

Contents

Evaluation of a formal resilience curriculum for novice physicians-in-training on self-reported resilience: a randomized controlled trial

Submission ID

67

AUTHORS

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INTRODUCTION

Physician wellness continues to be an important topic, especially concerning mental illness and burnout.[1] In addition to detrimental effects on physician well-being, burnout is associated with an increased risk of patient safety incidents.[2] The Road to Mental Readiness (R2MR) military curriculum was developed to 'build awareness of mental illness and operational stress injuries through education with a goal to improving short-term performance and long-term health outcomes.'[3] Simulation Training for Resilience in Various Environments (STRIVE), an adaptation of R2MR, provides formal resiliency training to augment medical professional preparedness and positive adaptation in challenging clinical environments. Physicians-in-training have been identified as an at-risk population for burnout.[4] After initially completing a pilot study for feasibility, this randomized controlled trial (RCT) assesses the impact of the STRIVE course on self-reported resilience in junior residents. We propose that formal STRIVE training may improve self-reported resilience in physicians-in-training.

METHODS

Institutional research ethics board approval (REB 122259) was obtained. This is a single-centre RCT with a 1:1 allocation ratio. Participants were a convenience sample of first- and second-year residents from our institution's anesthesia and emergency medicine residency programs. A power calculation determined a sample size of 48 participants to detect statistical significance ($P < 0.05$, power 80%). This was achieved over a period of three academic years with two cohorts. Consented participants were randomized using REDCAP sequence generation. Participants randomized to STRIVE received a four-hour interactive workshop on wellness strategies followed by high-fidelity simulations to reinforce and apply learned techniques. Participants randomized to the control group received information regarding available resilience resources for self-study. Study design and intervention details were concealed from control group participants to minimize subject bias. Self-reported resilience was quantified

using the validated Connor-Davidson Resilience Scale (CD RISC-10). Scores range from 0–40 with higher scores indicating greater perceived resilience.[5] Anonymous surveys were electronically distributed to all participants prior to the course delivery (baseline) and at 3-months postintervention. Resilience scores at three-months were compared between groups using an ANCOVA model with baseline scores from respective groups used as a covariate. Data are presented as mean [interquartile range (IQR)].

RESULTS

A total of 54 residents were consented from 58 potential participants. The STRIVE course was completed by all participants randomized to the intervention group (*n* = 27). Follow-up surveys were completed by 96% (26/27) of the STRIVE group and 85% (23/27) of the control group. Baseline resilience scores between groups were similar (STRIVE: 27 [5.25]; control: 29 [6]). Reported resilience scores three-months postintervention increased in the STRIVE group (30.5 [4.75]) while remaining similar in the control group (29 [7]). After adjustment for baseline resilience scores, there was a statistically insignificant increase in three-month resilience scores in the STRIVE group compared with the control (*P* = 0.114). In the postintervention survey, 96% of respondents reported that skills learned during the STRIVE course had positively contributed to coping strategies employed during stressful clinical situations.

DISCUSSION

This study demonstrates statistically insignificant improved self-reported resilience scores in anesthesia and emergency medicine residents who participated in the STRIVE course. In addition, 96% of respondents of the intervention group reported the skills learned during the STRIVE course to positively contribute to coping strategies employed during stressful clinical situations. While not statistically significant, it is encouraging to see a trend towards benefit in the intervention group. A final survey will be obtained at the six-month postintervention timeframe to see if this trend continues. This study supports the consideration for introducing the STRIVE curriculum into formal postgraduate education curriculum.

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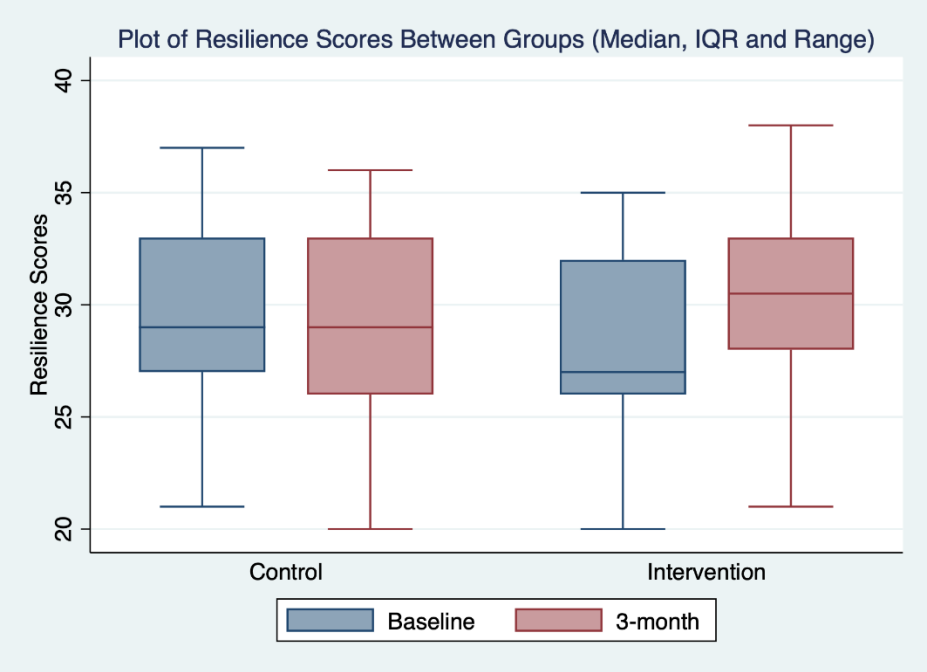
Figure



Facilitators and barriers to performing ultrasound guided regional anesthesia by nonregional expert anesthesiologists: a qualitative study using the theoretical domains framework

Submission ID

91

AUTHORS

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INTRODUCTION

Ultrasound-guided regional anesthesia (UGRA) has become the preferred technique for performing regional blocks and is recognized as a requisite skill all anesthesiologists should possess.[1] Though peripheral nerve blocks have compelling evidence to support their use across different populations, many patients who would otherwise benefit from regional anesthesia may not have access to these procedures.[2] Regional anesthesia experts have identified potential facilitators and barriers to the provision of UGRA,[3] although the perspectives of nonregional trained anesthesiologists have yet to be explored. Given that nonregional experts make up the majority of anesthesia providers, this study aimed to apply the Theoretical Domains Framework (TDF)[4] to qualitatively investigate the facilitators and barriers of nonregional anesthesiologists performing UGRA procedures during the perioperative period.

METHODS

After Research Ethics Board approval, we recruited staff anesthesiologists from both academic and community centres within Canada, excluding participants who possessed a regional anesthesia fellowship. Participants engaged in semistructured interviews based on the TDF, aimed at elucidating barriers and facilitators to UGRA. The interview guide was adapted from previous TDF studies within the field of anesthesiology and further informed by experts in regional anesthesia, qualitative research, and behaviour change. The interview guide was piloted to ensure the questions were clear. All study authors approved the final interview guide before recruitment. Using direct content analysis, interview transcripts were deductively coded into the relevant TDF domains, with an average percent agreement of 96% between the two coders. Subsequently, these codes were used to generate specific belief statements within each TDF domain. TDF domains were classified as relevant, or more likely to influence behaviour, by

the two coders and confirmed by a TDF expert. A domain was considered relevant based on the frequency of specific beliefs across interviews, the number of beliefs in each domain, the presence of conflicting beliefs signaling variation in beliefs and attitudes, and evidence of strong beliefs that could directly influence the performance of UGRA.

RESULTS

Data saturation was achieved after 14 interviews. Subsequently, the following eight TDF domains were identified as relevant: skills, beliefs about capabilities, beliefs about consequences, memory/attention/decision-making, environmental context and resources, social/professional role/identity, social influences, and behavioural regulation. Our results reinforced that nonregional trained anesthesiologists view UGRA as a critical component of the anesthesiologist's professional role, and as a worthwhile skill that benefits patient outcomes. Facilitators to UGRA provision included access to dedicated block rooms, pre-emptive scheduling for block patients, dedicated pathways that incorporate regional anesthesia, and availability of further skill-based training in regional anesthesia (either formal or informal). Several barriers were identified, including a perceived lack of adequate facilities, a lack of up-to-date patient outcome evidence for various blocks, skilled support staff, and sufficient opportunities to provide UGRA. Further, surgeons' expectations around UGRA provision were identified as a social barrier to regional anesthesia.

DISCUSSION

This study identified key facilitators and barriers to UGRA provision by nonregionalists, informing potential future interventions. Specifically, access to human and physical resources, such as block rooms and anesthesia assistant support, was identified as an environmental intervention to facilitate UGRA administration. Many nonregionalists wanted consensus regarding evidence, indication, and type of block to help facilitate decision-making. Interestingly, one barrier was a lack of opportunity to practice regional anesthesia, which was more common in centres with fellowship-trained regional anesthesiologists. There was a strong desire for more training opportunities to hone regional skills, and mentorship from those with more regional experience.

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Management of incidental findings within point-of-care ultrasound training programs: a survey of Canadian anesthesia residency training programs

Submission ID

104

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INTRODUCTION

An incidental finding is any unanticipated discovery made by an imaging modality, conducted for an unrelated reason.[1,2] The frequency of incidental findings uncovered by point-of-care ultrasound (POCUS) is reported to be between 1.6–26%.[3] POCUS trainees detect higher rates of incidental findings compared with experienced POCUS users.[2] Tewari *et al*. found that emergency medicine residents identified incidental findings in 26% of POCUS scans performed, with 66% concordance with radiologists.[2] Most findings were deemed “not clearly benign” and were subsequently confirmed by additional investigations.[2] Therefore, resident detected incidental findings are common and may have important clinical implications for patients. As POCUS becomes a standard of practice in anesthesia, residency programs and the Royal College have responded by creating formal POCUS education curriculums.[4] We conducted a survey of Canadian anesthesiology POCUS program leads to determine how incidental findings are managed. Our goal was to develop a formal incidental findings protocol.

METHODS

We surveyed the POCUS education leads of all 17 Canadian anesthesia residency programs. The internet-based survey asked POCUS leads to report on the frequency of incidental findings encountered by residents, and the presence and structure of an incidental findings protocol within their program. Survey responses were summarised using descriptive statistics and presented as a percent of total responses for each survey question.

RESULTS

The survey was completed by ten out of 17 Canadian anesthesia residency programs. Ninety percent of programs reported encountering incidental findings in perioperative patients who volunteered for POCUS scans for resident learning. Of programs that had identified incidental findings, 56% ordered formal imaging, 33% referred the patient to their family doctor or

specialist for follow-up, and 11% ordered formal imaging and referred the patient for follow-up. Despite this, 50% of anesthesia programs did not have a protocol in place for addressing incidental findings identified by resident learners. Only 20% of programs had formal incidental findings protocol and 30% of programs had informal protocols. The POCUS education leads of all ten programs agreed that a formal incidental findings protocol should exist as part of a formal POCUS training program.

DISCUSSION

Anesthesia residents are encountering incidental findings during POCUS training. Despite this, most anesthesia POCUS curriculums across Canada have not implemented a formal incidental findings protocol. Our proposed incidental findings protocol emphasizes documentation, recommends collaborative decision making, considers anesthesia specific patient care settings, as well as implications on anesthetic care (Figure).[5]

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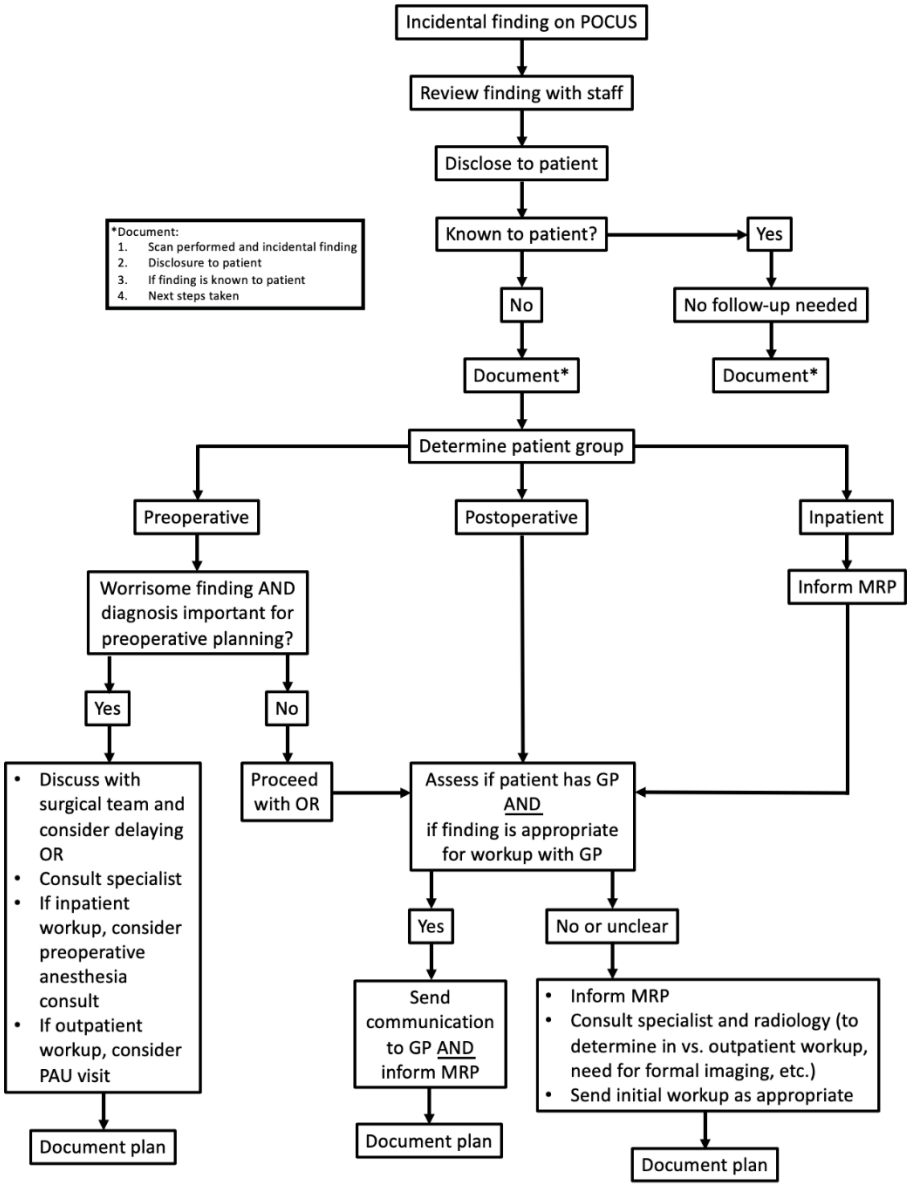
Figure Proposed incidental findings protocol



GP = general practitioner; MRP = most responsible physician; OR = operating room; PAU = pre-admission unit; POCUS = point-of-care ultrasound

Perioperative benzodiazepine administration and patient-reported recovery outcomes

Submission ID

116

AUTHORS

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INTRODUCTION

Benzodiazepines are administered during the perioperative period to improve the patient experience. Nevertheless, recent studies have suggested that perioperative benzodiazepines may be associated with harm, including postoperative delirium and cognitive dysfunction. We conducted a systematic review and meta-analysis to assess the safety and efficacy of perioperative benzodiazepine administration. Here we report on four patient-reported outcomes: postoperative pain, anxiety, satisfaction, and quality of recovery. Patient-reported outcomes are important measures that may differ from clinician-measured outcomes and provide important patient perspectives of treatment benefits and harms.

METHODS

We searched Cochrane CENTRAL, MEDLINE, Embase, PsychINFO, CINAHL, Web of Science, clinical trial registries, and reference lists from included articles from inception to September 2023 using a search strategy developed by a medical librarian. We included randomized controlled trials (RCTs) of all languages comparing administration of benzodiazepines to other agents or placebo in adults undergoing inpatient surgery. Two reviewers independently screened and extracted data from included studies; disagreements were resolved by consensus. We evaluated the effects of perioperative benzodiazepines on each outcome in the short- (< 24 hr postoperative) and long-term (> 24 hr postoperative). We converted reported data to a 0–10 Visual Analogue Scale for pain, QoR-15 for quality of recovery, State-Trait Anxiety Scale for anxiety, and 0–10 Visual Analogue Scale for patient satisfaction. We pooled data using a random-effects model and assessed the quality of evidence for each outcome using the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) approach.

RESULTS

We screened 32,384 full texts and included 102 RCTs. Patient satisfaction and anxiety were evaluated only in the short-term because of an insufficient number of studies. We found that perioperative benzodiazepines, compared with another agent or placebo, were associated with higher anxiety (mean difference [MD], 2.37; 95% confidence interval [CI], 1.15 to 3.60). Benzodiazepine administration did not improve short- (MD, 0.02; 95% CI, -0.26 to 0.29) or long-term pain (MD, −0.01; 95% CI, −0.33 to 0.30), short- (MD, −1.74; 95% CI, −7.44 to 3.96) or long-term quality of recovery (MD, −0.33; 95% CI, −7.58 to 6.92), or satisfaction with anesthesia (MD, −3.71; 95% CI, −9.14 to 1.73).

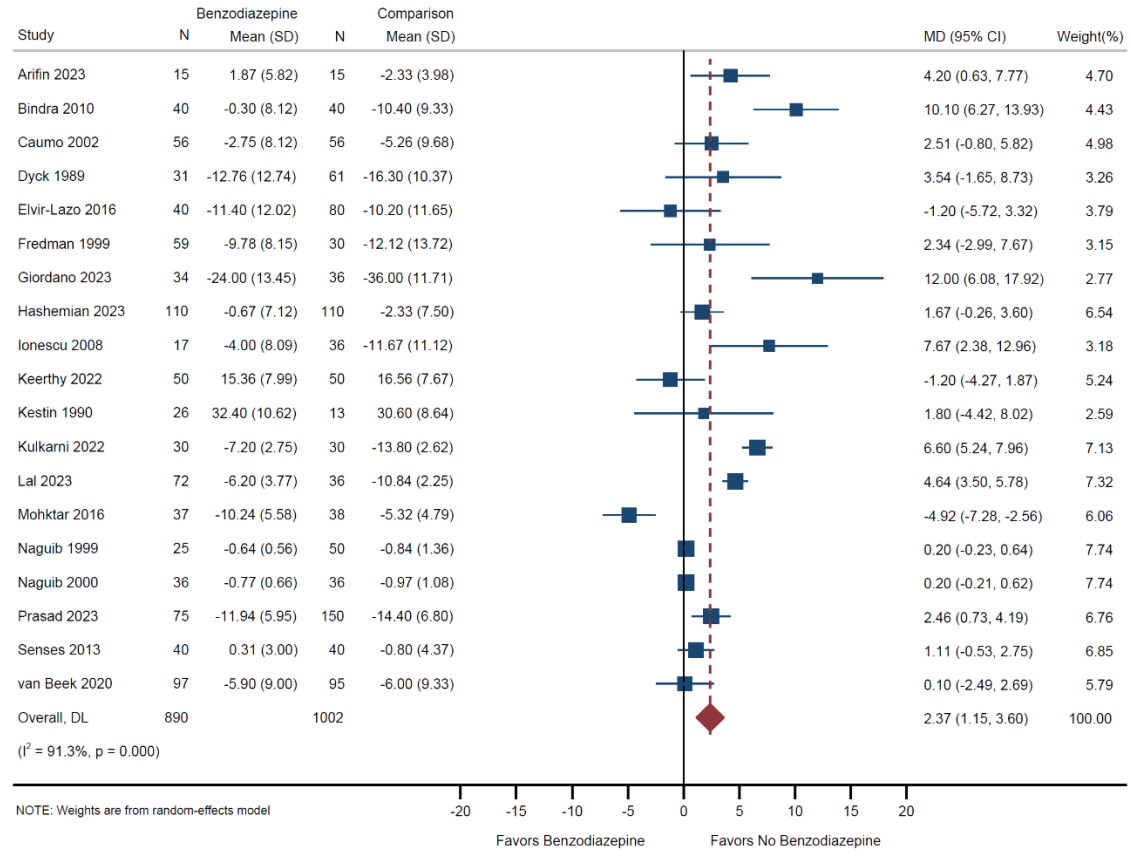
DISCUSSION

Based on data from 102 RCTs including a total of 10,573 patients, we found that perioperative benzodiazepines may increase patient-reported postoperative anxiety and have no effect on postoperative pain, quality of recovery, or satisfaction with anesthesia. Given the previously reported relationship of benzodiazepines with adverse postoperative neurocognitive outcomes, avoidance of perioperative benzodiazepines should be considered.

REFERENCES

No references.

Figure


Study
Benzodiazepine N
Benzodiazepine Mean (SD)
Comparison N
Comparison Mean (SD)
MD (95% CI)
Weight(%)
Arifin 2023 15 1.87 (5.82) 15 -2.33 (3.98) 4.20 (0.63, 7.77) 4.70
Bindra 2010 40 -0.30 (8.12) 40 -10.40 (9.33) 10.10 (6.27, 13.93) 4.43
Caumo 2002 56 -2.75 (8.12) 56 -5.26 (9.68) 2.51 (-0.80, 5.82) 4.98
Dyck 1989 31 -12.76 (12.74) 61 -16.30 (10.37) 3.54 (-1.65, 8.73) 3.26
Elvir-Lazo 2016 40 -11.40 (12.02) 80 -10.20 (11.65) -1.20 (-5.72, 3.32) 3.79
Fredman 1999 59 -9.78 (8.15) 30 -12.12 (13.72) 2.34 (-2.99, 7.67) 3.15
Giordano 2023 34 -24.00 (13.45) 36 -36.00 (11.71) 12.00 (6.08, 17.92) 2.77
Hashemian 2023 110 -0.67 (7.12) 110 -2.33 (7.50) 1.67 (-0.26, 3.60) 6.54
Ionescu 2008 17 -4.00 (8.09) 36 -11.67 (11.12) 7.67 (2.38, 12.96) 3.18
Keerthy 2022 50 15.36 (7.99) 50 16.56 (7.67) -1.20 (-4.27, 1.87) 5.24
Kestin 1990 26 32.40 (10.62) 13 30.60 (8.64) 1.80 (-4.42, 8.02) 2.59
Kulkarni 2022 30 -7.20 (2.75) 30 -13.80 (2.62) 6.60 (5.24, 7.96) 7.13
Lal 2023 72 -6.20 (3.77) 36 -10.84 (2.25) 4.64 (3.50, 5.78) 7.32
Mohktar 2016 37 -10.24 (5.58) 38 -5.32 (4.79) -4.92 (-7.28, -2.56) 6.06
Naguib 1999 25 -0.64 (0.56) 50 -0.84 (1.36) 0.20 (-0.23, 0.64) 7.74
Naguib 2000 36 -0.77 (0.66) 36 -0.97 (1.08) 0.20 (-0.21, 0.62) 7.74
Prasad 2023 75 -11.94 (5.95) 150 -14.40 (6.80) 2.46 (0.73, 4.19) 6.76
Senses 2013 40 0.31 (3.00) 40 -0.80 (4.37) 1.11 (-0.53, 2.75) 6.85
van Beek 2020 97 -5.90 (9.00) 95 -6.00 (9.33) 0.10 (-2.49, 2.69) 5.79
Overall, DL 890 1002 2.37 (1.15, 3.60) 100.00
(I^2 = 91.3%, p = 0.000)
NOTE: Weights are from random-effects model
-20 -15 -10 -5 0 5 10 15 20
Favors Benzodiazepine
Favors No Benzodiazepine

Preoperative malnutrition screening: a window of opportunity

Submission ID

40

AUTHORS

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INTRODUCTION

Between 15–40% of cancer patients are malnourished at diagnosis, and this proportion increases to 40–80% throughout disease treatment.[1] Perioperatively, these patients are at increased risk of infection, impaired wound healing and decreased functional capacity.[2] Early identification of patients at risk of malnutrition with validated screening tools and referral to a dietitian has been shown to improve outcomes.[3] Despite this, adoption of screening practices remains low.[4] Our goals were to answer the following research questions: to what extent 1) are patients at malnutrition risk before cancer surgery in our tertiary care centre? 2) are at-risk patients referred to a registered dietitian (RD)/ prehabilitation program before surgery? 3) does malnutrition risk predict clinical outcomes postoperatively? 4) does referral of at-risk patients change their clinical outcome postoperatively?

METHODS

A retrospective chart review was conducted for all patients undergoing elective thoracic and abdominal cancer surgeries between July 2019 to 2020 at our tertiary care centre. Our local research ethics board authorized the study (registration number 2021-7108). Patients with benign pathologies were excluded. Malignant pathologies were divided into 4 cancer groups: upper gastrointestinal (UGI), lower gastrointestinal (LGI), lung/thoracic and other. Two to four weeks before surgery, all patients completed a validated nutrition risk screening tool, Malnutrition Screening Tool (MST), composed of two questions: 1) decreased appetite 2) unintentional weight loss. A “yes” answer to both questions (MST = 2) denoted greatest nutrition risk and MST = 0 signified no risk.[5] Measured outcomes included nutrition consult before surgery (maximum three months prior), length of primary admission (LOS), complication rate, number of emergency department (ED) visits as well as readmissions within 30 days of

surgery. Statistical analysis was done using Stata version 14. Categorical variables were analyzed using Chi square test. Continuous variables were analyzed using multivariate negative binomial analysis (i.e., LOS reported using incidence risk ratio [IRR]), or analyzed using logistic regression (i.e., complication rates reported with odds ratio [OR]). These variables were adjusted for type of cancer, age, sex, neoadjuvant therapy, and number of comorbidities.

RESULTS

Five hundred and nineteen patients were included. Altogether, 28% (*n* = 146) of patients had some malnutrition risk (MST = 1–2). 38% of at-risk patients (MST = 1–2; *n* = 56), and 63% of highest risk patients (MST = 2; *n* = 27) had a referral to a RD/prehabilitation. In unadjusted analysis, LOS significantly increased from median 3 [2–5] to 4 [2–7] to 7 [5–10] days with increasing nutrition risk severity. Compared with the no risk group, MST = 2 was associated with more ED visits (19% *vs* 8%; *P* = 0.04), greater incidence of any complications (60% *vs* 34%; *P* = 0.002) including surgical (23% *vs* 7%; *P* = 0.001), serious (30% *vs* 8%; *P* < 0.001) and infectious complications (14% *vs* 3%; *P* = 0.008). In the adjusted analysis, LOS was significantly increased in the at-risk groups compared with the no risk group, MST = 1–2 (IRR, 1.4 [1.14 to 1.62]; *P* < 0.001) and MST = 2 (IRR, 1.8 [1.4 to 2.4]; *P* < 0.001). Nevertheless, increased incidence of any complication was associated only with the MST = 2 group (OR, 2.2 [1.1 to 4.5]; *P* = 0.024). Referral for nutrition consultation did not modify outcomes.

DISCUSSION

One-third of preoperative cancer patients were at risk of malnutrition. The majority of highest risk patients were referred for nutrition consultation. Malnutrition risk was associated with higher LOS, increased ED visits, greater incidence of complications, including surgical, infectious, and serious complications. Referral to RD/prehabilitation did not modify clinical outcomes. Malnutrition risk was not assessed post referral, and thus we were unable to determine the effectiveness of the nutritional intervention. These findings highlight the importance of identifying cancer patients with malnutrition preoperatively. Interventions that modify malnutrition, such as prehabilitation, in the short window of opportunity before surgery should be further investigated.

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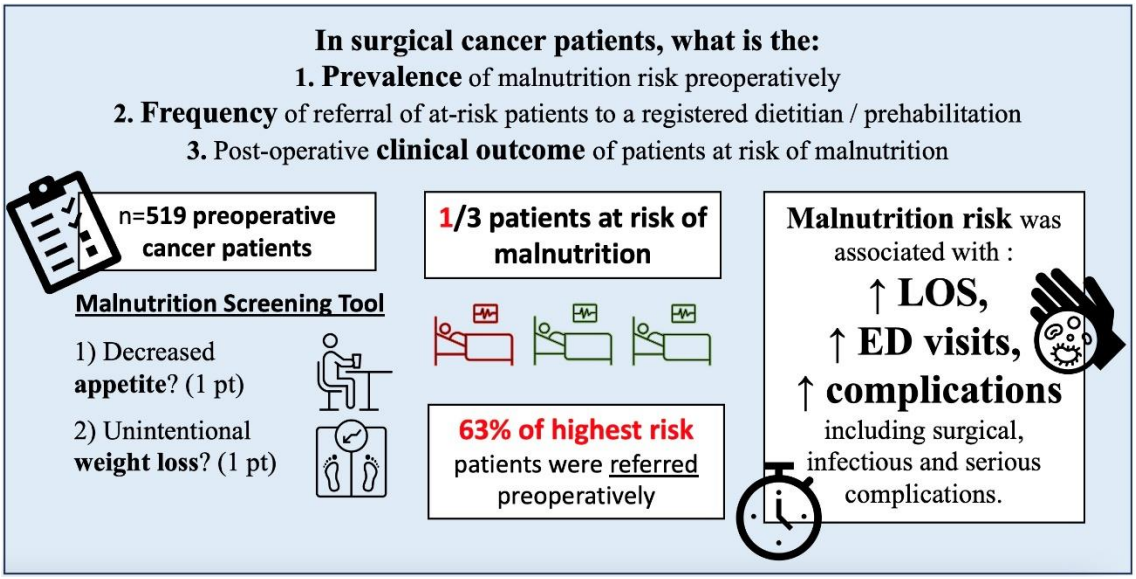
Figure



Surgical Apgar Score and Shock Index are associated with acute deterioration after major abdominal surgery

Submission ID

124

AUTHORS

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INTRODUCTION

Patients undergoing major abdominal surgery are at high risk of postoperative clinical deterioration.[1] Currently there are limited tools to help guide postoperative disposition decisions (e.g., transfer to intensive care unit [ICU] *vs* high-acuity unit *vs* surgical ward). Traditional risk factors such as advanced age, surgery type, and comorbidities are neither sensitive nor specific in predicting postoperative clinical deterioration. This project sought to determine if readily available intraoperative hemodynamic parameters, such as the Surgical Apgar Score (SAS)[2] and Shock Index (SI),[3] were associated with clinical deterioration (unplanned ICU admission and/or rapid response team activation) in the first 72-hr after major abdominal surgery.

METHODS

We conducted a matched case-control study of patients who underwent major abdominal surgery between 2012–2018 at a large quaternary trauma centre. The centre includes a 33-bed ICU with a rapid response team but no high acuity or step-down unit. Major abdominal surgery was defined as any open laparotomy general or hepatobiliary procedure. Cases were defined as patients who were discharged from the postanesthetic care unit (PACU) to the surgical ward and then experienced an unplanned ICU admission or code/rapid response team activation in the first 72-hr postoperatively. Controls were defined as patients who underwent major abdominal surgery without clinical decompensation. Cases were matched 1:1 with controls using Canadian Classification Intervention (CCI) procedure code, age, sex, American Society of Anesthesiologists (ASA) Physical Status classification, emergency status, epidural analgesia, and year of surgery. A Surgical Apgar Score (SAS) was calculated using the lowest heart rate, lowest mean arterial pressure, and estimated blood loss. A score less than 7 was defined as high risk.[4] A Shock Index (SI) was calculated by dividing heart rate by systolic blood pressure. A SI greater than 0.9 was defined as high risk.[3] Conditional logistic regression models for matched case-control groups were created adjusting for confounders.

RESULTS

We included 164 patients (82 cases and 82 controls) incorporating more than 65,000 hemodynamic measurements. The median age was 68 (interquartile range [IQR], 57–76) and 102 (62%) were male. A total of 116 (71%) patients were ASA III/IV with 126 (77%) having two or more significant comorbidities. All surgeries were either general surgical (102 [62%]) or hepatobiliary (62 [38%]) procedures. The primary surgical indication was malignancy in 114 (70%) and 54 (33%) were emergency cases. Among cases, 42 (51%) patients deteriorated respiratory failure and 21 (26%) from hypotension. A SAS less than 7 was strongly associated with a statistically significant increase in the odds of acute decompensation (adjusted odds ratio [aOR], 6.78; 95% confidence interval [CI], 2.96 to 15.5). Both intraoperative and PACU mean SI above 0.9 were associated with a statistically significant increase in the odds of acute decompensation (aOR, 3.71; 95% CI, 1.15 to 12.0 and aOR, 2.72; 95% CI, 1.22 to 6.07 respectively).

DISCUSSION

In this matched case-control study of 164 patients undergoing major abdominal surgery both the SAS and SI were strongly associated with acute decompensation in the first 72 hr postoperatively. Our cohort included highly comorbid patients that underwent high risk abdominal surgery but met criteria to be discharged from the PACU to the general surgical ward. Previously, the SAS and SI have been demonstrated to predict postoperative complications but not acute postoperative decline.[4] The SAS and SI may be a powerful tool to inform postoperative disposition. Larger studies are needed to further validate these results.

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