

Gastrointestinal Cancer Patients' Longitudinal Trajectories of Psychological Stress During Surgery and Their Relationship with Recovery Quality

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Abstract

Many patients find the thought of undergoing surgery, especially for gastrointestinal cancer, to be overwhelming. Despite being a prevalent complaint, little is known about the patterns of psychological stress in perioperative patients. In this study, perioperative stress in patients with gastrointestinal cancer was examined in relation to different trajectories, as well as antecedent factors and hospitalization outcomes.

Keywords: Perioperative period; Gastrointestinal cancer; Psychological stress; Growth mixture model; Quality of recovery

Introduction

In terms of cancer incidence, gastric cancer is the third most common cause of cancer-related death and ranks fifth overall. Surgical resection and preoperative chemotherapy make up the curative course of action. The postoperative mortality and complication rates for gastric cancer surgery are roughly 4% and 40%, respectively, and are accompanied with considerable morbidity. Gastric cancer surgery is seen as a treatment requiring specific surgical ability, talents, and concentration since a volume-outcome relationship has been reported at the surgeon and hospital levels. Theoretically, skilled, seasoned, and committed surgeons, operating room personnel, residents, intensive care unit personnel, and (intervention) radiologists produce better surgical results [1].

Numerous researches suggested that non-procedural factors might affect how complicated surgical procedures turn out. It has been argued that scheduling elective surgery for the end of the week or on the weekend leads to worse surgical results because the surgeon may be less focused as the week goes on or may have less access to resources for postoperative care. A national study conducted in Sweden discovered a worse prognosis following cancer surgery over the holidays than during non-holiday times. This might be caused by the lack of skilled and committed medical staff or by the fact that the remaining hospital staff has a heavier workload over the holidays [2]. Longer waiting lists and higher postoperative morbidity rates were observed during the holiday season, according to a different study that looked at how holidays affected the short-term outcomes of pancreatic surgery.

To our knowledge, there isn't much literature on how holidays affect the immediate results of stomach cancer surgery. The availability of less skilled and specialised surgical teams during the holiday season may contribute to the inferior outcomes of difficult surgical procedures, according to recent studies. The purpose of this study was to ascertain how holidays affected clinical procedures, the length of the healing process, and the immediate results of gastric cancer surgery in the Netherlands [3-5].

Material and Methods

Study design

Between April 2020 and April 2021, a long-term follow-up study was carried out in a specialised oncology hospital in China. This study received ethical approval from the university's human research ethics

committee (Approval No. 2020-R-053).

Participants

There was convenience sampling. Participants in this study had to be at least 18 years old, have a surgical treatment plan booked, have gastrointestinal malignancies diagnosed by clinical pathology, and be able to speak and read Chinese clearly in order to complete the questionnaires. If a participant met at least one of the following requirements, they were deemed ineligible for participation: (1) the existence of serious organic diseases; and (2) the presence of cognitive and mental abnormalities. If interested in taking part in this study, potential volunteers gave informed consent [6].

Measurements and data collection

At the outset, demographic, medical, and psychological information was gathered (1-3 days before surgery). Prior to discharge, follow-up evaluations of psychological stress and the level of recovery were carried out 1-3, 4-6, and 7-9 days after surgery. The perioperative period was used to gather data for all five sets.

Quality of recovery

The Chinese Quality of Recovery (QoR-15) questionnaire, which has been used with surgery patients, is a self-reported questionnaire with 15 questions to evaluate participants' mental and physical well-being within the previous 24 hours. Pain, physical comfort, physical independence, psychological support, and emotional condition are its five dimensions. The total score ranged from 0 to 150, with each question receiving a rating between 0 (none) and 10 (very). Better recovery quality was indicated by higher scores. The Cronbach's alpha for this scale in this study was 0.648, 0.749, 0.784, 0.842, and 0.789,

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respectively, at the five time points.

Neuroticism subscale of the Big Five Inventory

The 44-item Chinese Big Five Inventory (BFI), which measures neuroticism, was utilised in this study to calculate neuroticism scores. Eight items were evaluated on a Likert scale of 1 (strongly agree) to 5 (highly agree) (strongly agree). Greater neuroticism was reflected in higher scores. The scale used in this investigation had a Cronbach's alpha of 0.972.

Brief illness perception questionnaire

Eight items make up the Chinese brief sickness perception questionnaire, which is graded on an 11-point scale from 0 (none) to 10 (very). The overall score was calculated by adding the three reverse-scored items to the other seven. Higher ratings revealed more unfavorable attitudes toward sickness [7]. The scale used in this investigation had a Cronbach's alpha of 0.779.

Insomnia severity index

The Chinese Insomnia Severity Index, a brief self-reported insomnia scale with seven items, was primarily used in this study to assess the severity of preoperative insomnia. Each item is divided into five grades, ranging from 0 (none) to 4 (extremely severe), for a total score of 28. Higher scores show that sleeplessness is more severe. In this investigation, the Cronbach's alpha was 0.964 [8].

Data analysis

Utilizing Mplus 7.0 and SPSS 22.0, analysis was carried out. First, the perioperative psychosocial stress trajectories in patients with gastrointestinal cancer were investigated using the growth mixture model (GMM). The Akaike information criterion (AIC), Bayesian information criterion (BIC), adjusted BIC (ABIC), Lo-Mendell-Rubin adjusted likelihood ratio test (LMR), and bootstrapped likelihood ratio test were used to determine the ideal number of latent classes.

Second, frequencies (percentages) for categorical variables and means and standard deviations for continuous variables were used to produce descriptive statistics. To examine variations in the selected trajectory subgroups' demographic, clinical, and psychological factors, one-way ANOVA and chi-square tests were used. In order to compare the detected trajectories' quality of recovery at the five time points and LOS, one-way ANOVA and LSD tests were also run [9]. The baseline predictors of each psychological stress trajectory were examined using a multinomial logistic regression analysis. The maximum likelihood robust estimation (MLR) and mean interpolation were chosen to fill in the missing values for patients who dropped out of the follow-up assessment. The cutoff for significance was set at $P < 0.05$.

Discussion

This is the first study that, as far as we are aware, compares the short-term surgical outcomes following gastric cancer surgery performed both during and outside of holiday seasons. It demonstrated that fewer stomach cancer resections were carried out over the holidays than they were throughout the rest of the year. Patients receiving surgery on holidays and on non-holiday days shared similar baseline traits. Treatment choices and wait times were comparable. However, the margins of tumor-positive resection increased over the holidays. Additionally, positive resection margin rates were lower over the holidays in a recent group of patients. Additionally, failure-to-rescue rates were noticeably greater in this sample following holiday surgery [10].

The results of complex surgery performed during the week were the subject of numerous studies, and it was speculated that poorer surgical outcomes might result from a decline in surgeon or surgical team precision late in the week and a reduction in available resources for postoperative care during the weekend. This sparked a number of research that hypothesised a similar association may be discovered when comparing the outcomes of complex surgery done outside of normal operating hours and on holidays, when staffing may be reduced and specialized specialists may not be present [11]. Inadequate survival rates for cancers of the hepatobiliary, colorectal, head and neck, thyroid, breast, kidney, and bladder were discovered in a population-based study conducted in Sweden. Instead of performing separate studies on patients with gastric cancer, they combined their data on 6124 patients with esophagogastric cancer and found no differences in long-term survival between surgeries performed over holidays and those performed outside of them [13]. This is in contrast to the findings of the current study, which point to worse long-term survival based on increased tumor-positive resection margins and failure-to-rescue rates over holidays. Another population-based study from Sweden looked into the impact of holidays on esophageal cancer surgery. Additionally, it found no differences in either short- or long-term mortality between surgeries performed on holidays and those performed on non-holidays.

Instead of conducting individual analyses of individuals with gastric cancer, they combined analyses of 6124 patients with esophagogastric cancer, which did not show any differences in long-term survival between surgery performed on holidays and surgery performed on other days. The findings of the current study are in contrast to this, as larger tumor-positive resection margins and failure-to-rescue rates during the holidays indicate worse long-term survival. The holiday impact in esophageal cancer surgery was the subject of another population-based Swedish investigation. Additionally, research found no distinction between surgeries performed on holidays and those performed on non-holidays in terms of short- or long-term mortality [14].

According to the current study, comparatively fewer patients (24%) underwent surgery on holidays than on non-holiday days, which may, in addition to lower patient presentation rates, represent a scaling back of medical staffing on holidays. Surgery during the holidays was not limited to low-risk patients despite the likely reduction in staff, as patient, tumor, and treatment characteristics were similar both during and outside of the holiday season. In addition, waiting times for treatments did not lengthen over the holidays. Therefore, despite having less employees, it appears that the Netherlands' system for treating stomach cancer is well-organized and ensures appropriate treatment time. Since there are conflicting findings regarding the ideal window of time between neoadjuvant therapy and surgery, extending the window until after the holiday season is not advised given the potential impact on oncological outcomes and patient anxiety [15].

Conclusion

Patients' needs are a major influence on the provision of transfusions. However, the effect of the treating physician and the hospital on variation in relation to other factors is significant and highlights opportunities to focus on processes of care that are modifiable to standardize perioperative packed red blood cell transfusion practice.

Acknowledgement

None

Conflict of Interest

None

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