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Factors associated with palliative care use in patients undergoing cytoreductive surgery and hyperthermic intraperitoneal chemotherapy

Rachel S. Morris, MD,[a] Faiz Gani, MBBS,[b] Abdulrahman Y. Hammad, MD,[a]
Wendy Peltier, MD,[c] T. Clark Gamblin, MD, MS, MBA,[a]
Kiran K. Turaga, MD, MPH,[a] and Fabian M. Johnston, MD, MHS[a,*]

[a] Division of Surgical Oncology, Department of Surgery, Medical College of Wisconsin, Milwaukee, Wisconsin
[b] Department of Surgery, Johns Hopkins University School of Medicine, Baltimore, Maryland
[c] Medical College of Wisconsin Palliative Care Center, Medical College of Wisconsin, Milwaukee, Wisconsin

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ABSTRACT

Background: Peritoneal carcinomatosis represents widespread metastatic disease throughout the abdomen and/or pelvis. Cytoreductive surgery/hyperthermic intraperitoneal chemotherapy (CRS/HIPEC) improves the overall survival compared to standard therapy alone. The role palliative care (PC) plays however, remains poorly studied among these patients.

Methods: Patients who had previously undergone HIPEC and who underwent an inpatient admission from 7/1/2013 to 6/30/2014 were identified to determine which patients were referred for inpatient or outpatient palliative consultation. Multivariable logistic regression analysis was performed to identify risk factors associated with the use of PC.

Results: Of the 60 patients analyzed, 23 (38.3%) had a PC consultation with a median time to PC referral of 310 (IQR: 151-484 days). Patients who were prescribed opioids (no PC referral *versus* PC referral: 46.0% *versus* 91.3%, $P < 0.001$), patients who reported the use of a cancer-related emetic (35.1% *versus* 87.0%, $P < 0.001$), patients reporting the use of total parenteral nutrition (16.2% *versus* 39.1%, $P = 0.046$), and patients dependent on a gastric tube for nutrition (5.4% *versus* 43.5%, $P < 0.001$) were more likely to be referred to a PC consultation. On multivariable analysis, use of opioids, use of a cancer-related antiemetic, and the use of a G-tube were independently associated with a greater odds for being referred to PC (all $P < 0.05$).

Conclusions: Approximately one-third of patients were referred to PC following cytoreductive surgery/hyperthermic intraperitoneal chemotherapy. Palliative care referrals were most commonly used for patients with chronic symptoms, which are difficult to manage, especially toward the end of life.

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* Corresponding author. Division of Surgical Oncology, Department of Surgery, Medical College of Wisconsin, 9200 West Wisconsin Ave, Milwaukee, WI 53226, USA. Tel.: +1414 805-5020; fax: +1414 805-5771.
E-mail address: fjohnst4@jhmi.edu (F.M. Johnston).

Introduction

Peritoneal surface malignancies represent a spectrum of diseases ranging from indolent (mucinous neoplasm of the appendix) to aggressive (peritoneal dissemination of gastric cancer/mesothelioma) cancers. The prognosis of these patients at diagnosis is quite variable and ranges from weeks to years.[1,2] Cytoreductive surgery and hyperthermic intraperitoneal chemotherapy (CRS/HIPEC) has increasingly gained favor as a tool in the multimodality treatment paradigm.[3] Yet, despite these advances, even patients with low-grade disease have a risk of presenting with poor prognostic features such as malignant bowel obstruction, moderate to severe malnutrition, intractable pain, and nausea, all of which have been reported to be associated with a poor prognosis.[4] In addition, there are numerous complications that can be encountered in the postoperative setting including the development of fistulae and delayed ileus, which occur in approximately 17%-40% of patients.[5,6] These risk factors are particularly important when considering an operative intervention as postoperative quality of life depends on age, the presence of poor prognostic features, hospital duration, and the development of postoperative complications.[7] Given this, efforts for a collaborative symptom management are increasingly being recognized.

Palliative care (PC) is defined by the National Cancer Institute as "care given to improve the quality of life of patients who have a serious life-threatening disease, such as cancer".[8] The goal of PC is to prevent or treat, as early as possible, the symptoms and side effects of the disease and its treatment.[9] It is increasingly available in most large cancer hospitals and may be delivered by the surgical oncology team, oncology team, PC team, or any combination.[10] The American Society of Clinical Oncology recommends early initiation of PC for patients with advanced, life-threatening cancer.[11] Benefits of PC include improved symptom management, quality of life, and transition to hospice. Palliative care consultation, however, is not well studied among patients with peritoneal carcinomatosis, and rates of utilization of PC services remain largely unknown. Furthermore, current literature fails to describe/identify patients that would be most likely to be referred to PC. Therefore, the objective of this study was to describe the current patterns of utilization of PC consultation among patients who underwent CRS/HIPEC at our institution. In addition, we sought to identify risk factors' association with PC referral.

Materials and methods

Study population and data sources

A retrospective chart review was conducted for patients, seen between July 1, 2013 and June 30, 2014, who had undergone CRS/HIPEC or received an inpatient consult from the surgical oncology service following a prior CRS/HIPEC. All patients meeting the above criteria were included over the 1-y period. Data were abstracted by two authors (R.M., and A.H.); one author performed qualitative dual author reviews of all charts to promote consistency in data abstraction. Abstracted data included demographic information such as patient age, gender, marital status, race, primary origin of malignancy, and referral for palliative consultation as well as data pertaining to their medical course such as the total number of admissions, disease status (presence of recurrent disease), total number of chemotherapy regimens administered following presentation to our institution, and whether the patient died within 6 months of their last admission. Discharge to a skilled nursing facility, admission for malignant bowel obstruction, or an admission primarily for symptom management was also recorded. An admission was considered to be primarily for symptom management if the admission was not for a planned readmission or if the following criteria were documented: bowel obstruction requiring nasogastric tube, inability to tolerate oral intake, failure to thrive, need for supplementary nutrition (tube feeds, total parenteral nutrition [TPN]), abdominal pain related to disease or of unclear etiology, biliary obstruction, treatment-related renal failure, bleeding, and intra-abdominal inflammatory conditions (cholecystitis, diverticulitis, bowel perforation, and enteritis). We also captured cancer-related opioid and antiemetic use. These designations were made if there was documentation in the record of patients requiring either for more than 2 months after surgery. G-tube decompression must have been utilized for malignant bowel obstruction. TPN dependence in the past 2 months was a positive event regardless of etiology (malignant bowel obstruction *versus* intestinal failure following resection). Both inpatient and outpatient consultations were evaluated as this provides a real-world appreciation of utilization during the complete time frame the patient was studied. Study approval was obtained from the Medical College of Wisconsin Institutional Review Board.

Statistical analysis

Categorical data were presented as whole numbers and proportions, whereas continuous data were presented as median with interquartile range (IQR). Pearson's chi-squared test was used to compare categorical data, whereas the Kruskal-Wallis test was used to compare non-normally distributed continuous data. Univariable logistic regression analysis was performed to evaluate the association between patient and disease characteristics, and the referral to PC services. Patient and disease characteristics demonstrating a statistically significant association with the referral to PC services were then entered into a multivariable logistic regression model to identify risk factors that were independently associated with the referral to PC services. The inclusion and/or exclusion of variable into the final multivariable model were based on area under the receiver-operating characteristic curve, Akaike information criterion, and the Hosmer-Lemeshow goodness-of-fit test. Results of the logistic regression analyses were presented as odds ratios with corresponding 95% confidence intervals (95% CIs). A P value of <0.05 was used to determine statistical significance. All analyses were performed using STATA 14.0 (StataCorp, College Station, TX).