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Research paper

Skilled care utilization after abdominal and pelvic cancer surgery in older patients



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ABSTRACT

Background and objectives: Older cancer patients are less likely to return home after surgery. Utilization of post acute skilled services in this setting is associated with increased mortality. Medicare payments for post acute care continue to grow. This study aims to identify factors associated with the utilization of post acute services at hospital discharge after abdominopelvic cancer surgery.

Methods: This is a retrospective analysis of older cancer patients (age > 75) who presented to the Geriatrics clinic at Memorial Sloan Kettering Cancer Center for preoperative evaluation between October 2010 and December 2012. Sociodemographic features, pre-operative geriatric assessment, hospitalization characteristics and discharge disposition data were collected and analyzed.

Results: Out of 592 patients (age > 75), 291 (49.2%) were discharged home without services and 301 (50.8%) were discharged home with skilled services or to a skilled nursing facility. Older age (OR 1.058, $P = 0.010$), preoperative ADL dependency (OR 2.242, $P = 0.001$), longer operation time (OR 1.004, $P < 0.001$) and postoperative delirium (OR 2.213, $P = 0.004$) were independently associated with skilled care utilization.

Conclusions: Optimizing preoperative status, implementing delirium prevention protocols and streamlining the hospital stay may impact the discharge disposition, helping control healthcare costs and achieving a better outcome for the older surgical cancer patient.

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1. Introduction

Between 2012 and 2020, the United States will experience considerable growth in its older population. In 2050 the population aged 65 and older is projected to be 83.7 million, almost double its estimated population of 43.1 million in 2012 [1]. As cancer occurs more commonly in the older adults, this shift is expected to markedly increase the number of cancer diagnoses. Cancer is diagnosed at a higher rate (53%), accounts for a higher percentage of survivors (59%) and results in more deaths among individuals 65 years and older (68%) compared with younger adults [2].

Health care costs for patients over 65 are three to five times higher than costs for patients under 65. As the elderly population grows, these higher costs are projected to result in a 25 percent increase in the United States' health care spending by 2030 [3]. Oldest adults make up a larger share of hospital discharges

relative to their population size. In 2008, adults 85 and older accounted for only 1.8 percent of the population but 8.0 percent of all discharges; 75–84 year olds comprised 4.3 percent of the population but accounted for 13.8 percent of all discharges. As age increased, the percentage of routine discharges decreased, but discharges to long term care (e.g., nursing homes and rehabilitation facilities) increased [3].

Medicare payments for post acute care in the United States have grown faster than most other categories of healthcare spending, and in 2012 it exceeded \$62 billion [4]. This post acute care includes skilled services at home or at a nursing facility, long term care and inpatient rehabilitation. While studies have looked at discharge disposition in the elderly after hip fractures [5] and strokes [6], there is a paucity of data in strictly elderly patients after cancer surgery. A few studies, some of which also included patients younger than 65, showed increased skilled care utilization in elderly patients after colorectal [7], head and neck [8], pancreatic [9] and hepatic [10] oncologic surgeries. In addition, older cancer patients are less likely than to return home after surgery [7] and the utilization of post acute skilled services is associated with an increase in mortality [11]. The dearth of data looking at factors that

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predict or are associated with discharge disposition in the older old patients after cancer surgery is evident in a recent systematic review of literature by Feng et al. [12].

Surgical treatments of cancers in older adults can be curative or palliative. In the past, late detection of cancers, lower life expectancies, multiple medical comorbidities, cognitive impairment and high risk surgical procedures, have limited curative surgery options for these patients. Due to advances in public health and medicine, life expectancy is increasing. Successful implementation of cancer screening has increased the earlier detection of cancers at resectable stages. Minimally invasive surgical techniques have also become readily available. This has opened up the possibilities of surgical interventions to even the oldest old. Thus, in the future we expect an increase in surgical procedures in older cancer patients. Hence it becomes all the more important to identify factors that are associated with discharge disposition in this population. Pre-operative comprehensive geriatric assessment is likely to have a positive impact on postoperative outcomes in older patients undergoing elective surgery [13]. With adequate perioperative risk stratification, functional assessment, and oncologic prognostication, elderly patients with cancer can do as well in terms of morbidity and mortality as their younger counterparts [14].

This study aims to identify factors associated with the utilization of skilled care at discharge, in elderly patients over the age of 75, after elective abdominal and pelvic cancer surgery.

2. Materials and methods

2.1. Patients and methods

We performed a retrospective review of data related to abdominopelvic surgical cancer patients 75 years and older, who underwent preoperative geriatric assessment (GA) at Memorial Sloan Kettering Cancer Center (MSKCC) from August 2010 to December 2012.

Patients undergoing surgery at MSKCC require a medical clearance. The General Internal Medicine (GIM) service performs this evaluation in patients younger than 75. Patients who are 75 years and older are seen in the Geriatrics clinic, and as part of the medical clearance evaluation, they receive a GA as standard of care.

The outcome variable of this study is patient hospital disposition plan which is categorized into two groups: patients who were discharged to skilled nursing facilities (SNF) or home with visiting nurse services (VNS), and patients who were discharged home with no services.

We collected potentially associated pre-operative, intraoperative, and post-operative variables with the hospital disposition plan.

1. In the preoperative phase, socio-demographic characteristics (Age, Gender, Race and marital status) and clinical characteristics (cancer type) were collected from patients' medical records. The preoperative GA was performed by geriatricians (MD), geriatric nurse practitioners (NP) or trained registered nurses (RN) in the geriatric service. GA includes: (1) functional capacity assessed by (a) activities of daily living (ADLs) [15] which refer to self-care tasks including toileting, bathing, feeding, dressing, grooming, and ambulation. In this study, any impairment in ADL components is considered ADLs dependency. (b) Instrumental activities of daily living (IADLs) [15] which assess complex skills needed to successfully live independently include the ability to use a telephone, shop, prepare food, perform housekeeping tasks, do laundry, mode of transportation used to get around, be responsible for one's own medications, and the ability to handle finances. In this study,

any impairment in IADL components is considered IADLs dependency. (c) Patient reported history of falls in the last 12 months; (2) cognitive status assessed by Mini-Cog test [16] composed of (a) 3-item recall test with 1 point for each recalled word. (b) Clock-drawing test (CDT) with 0 point for an abnormal CDT and 2 points for a normal one. For the purpose of this study, Mini-Cog scores were categorized into scores of greater than 3 and 3 or less. (3) Polypharmacy that indicated concomitant use of 5 or more medications at the time of evaluation. We categorized the number of patients' medications into 3 groups: 0–4 (no polypharmacy), 5–10 (polypharmacy) and more than 10 (excessive polypharmacy); (4) social support was screened for in the social history. It was recorded as either a Yes or a No based on patient report. Patients that had no social support were those that were not married, were not living with family/partner, had no children, did not have home care and came unaccompanied to the preop visit. (5) Nutritional status assessed by (a) patient reported weight loss, and (b) measured albumin level, categorized into 4 or more, and less than 4. (6) Comorbidities calculated by Charlson Comorbidity Index (CCI) [17] which includes 19 diseases weighted based on their association with mortality. The higher the score, the more comorbidities patient has. For the purpose of this study, it has been categorized into CCI 0–5 and more than 5.

2. In the intraoperative phase, we collected data on American Society of Anesthesiologists' (ASA) score [18], a subjective assessment to evaluate overall preoperative health of surgical patients. This was captured by Anesthesiologists before initiation of the operation. ASA scoring has six classes-1 through 6, with higher scores indicating lower physical status. We also obtained data on the site of surgery and operation time.

3. In the postoperative phase, data on the development of delirium, measured by MD, and/or geriatrics NP utilizing the Confusion Assessment Method (CAM), and length of stay were collected.

3. Statistical analysis

Fisher exact tests and Wilcoxon rank sum tests were used to measure the associations between potentially associated clinical data (preoperative, intraoperative, and postoperative measures) and skilled care utilization. Variables with *P* value of less than 0.05 were used for multivariate model building. The 7 variables with *P* value of less than 0.05 were entered into the model using the stepwise selection method. These were age, gender, ADL, iADL, operation time, delirium, and length of hospital stay. All analyses were performed using SPSS v.22.0 (IBM Corp, Armonk, NY, USA).

4. Results

Between September 1, 2010, and December 31, 2012, 592 patients with a mean age of 80 years (75–98 years) who underwent abdominopelvic cancer surgery, were followed postoperatively by the Geriatrics Service. Of the 592 patients analyzed, 291 (49.2%) went home without services and 301 (50.8%) required skilled services at the time of hospital discharge. The patients had the following malignancies: hepato-pancreatobiliary (27%), colorectal (28.2%), gastric (11.2%), gynecological (15.2%), or urological (18.4%) cancer. Presurgical clinical and functional characteristics obtained during preoperative geriatric consultation are presented in Table 1.

Among sociodemographic factors, older age ($P=0.011$) and female sex ($P=0.029$) were found to have a significant association with utilization of skilled services. From the geriatric assessment, dependency in ADLs ($P<0.001$) and IADLs ($P=0.032$) had significant association. History of weight loss showed a tendency

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