End-of-Life Care at a Community Cancer Center

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Abstract

Purpose: The evidence-based use of resources for cancer care at end of life (EOL) has the potential to relieve suffering, reduce health care costs, and extend life. Internal benchmarks need to be established within communities to achieve these goals. The purpose for this study was to evaluate data within our community to determine our EOL cancer practices.

Methods: A random sample of 390 patients was obtained from the 942 cancer deaths in Wicomico County, Maryland, for calendar years 2004 to 2008. General demographic, clinical event, and survival data were obtained from that sample using cancer registry and hospice databases as well as manual medical record reviews. In addition, the intensity of EOL cancer care was assessed using previously proposed indicator benchmarks.

The significance of potential relationships between variables was explored using χ^2 analyses.

Results: Mean age at death was 70 years; 52% of patients were male; 34% died as a result of lung cancer. Median survival from diagnosis to death was 8.4 months with hospice admission and 5.8 months without hospice ($P = .11$). Four of eight intensity-of-care indicators (ie, intensive care unit [ICU] admission within last month of life, > one hospitalization within last month of life, hospital death, and hospice referral < 3 days before death) all significantly exceeded the referenced benchmarks. Hospice versus nonhospice admissions were associated ($P < .001$) with ICU admissions (2% v 13%) and hospital deaths (2% v 54%).

Conclusion: These data suggest opportunities to improve community cancer center EOL care.

Introduction

Almost half of all patients with cancer will either present with, or will ultimately develop, incurable metastatic disease.¹ Despite these large numbers, minimal resources are devoted to the relief of suffering in these patients.² In addition, the use of anticancer therapies near death has been characterized by extensive resource use and lack of hospice services.³⁻⁵ In this era of health care reform, the application of evidence-based use of resources for cancer care at end of life (EOL) may result in less aggressive care,⁶ improved quality of life (QOL), and reduced health care costs.⁷⁻¹⁰

Wicomico County (WC), Maryland, provides a unique opportunity to evaluate EOL care and the impact of hospice because of its geography and demographics. According to the US Census Bureau,¹¹ the 2010 WC population was 99,000. White persons accounted for 69%; African American persons, 24%; Hispanic persons, 5%; and persons below poverty level, 13%. Median annual household income in 2009 was \$46,000. WC is served by a single hospital, Peninsula Regional Medical Center (PRMC) with its associated cancer facility The Richard A. Henson Cancer Institute (RAHCI), and by a single hospice, Coastal Hospice (CH). The county is located on a peninsula that is geographically isolated by water and distance from large urban medical centers. Terminally ill patients with cancer who live in WC are therefore likely to receive almost all of their EOL care at PRMC and/or CH.

The Dartmouth Atlas¹² provides a searchable Web-based tool that allows analysis of Medicare beneficiary EOL cancer care by region or hospital for the years 2003 to 2007. WC represents 51% of the PRMC service area. According to Dart-

mouth Atlas data, 29% of patients with cancer in the PRMC service area died in the hospital, 62% were hospitalized in the last month of life, 18% were in the intensive care unit (ICU) in the last month of life, and 51% were admitted to hospice. In comparison, Beebe Medical Center in Lewes, Delaware, has a similar size catchment area and demographics. At that institution, there were 24% hospital deaths, 61% hospitalized in the last month of life, 30% in ICU in the last month of life, and 66% admitted to hospice. Another source of data is the Quality Oncology Practice Initiative (QOPI), which is a voluntary program developed by the American Society of Clinical Oncology.^{13,14} One optional module measures EOL care. The QOPI data set does not provide information on some of the intensity of care EOL indicators examined in this study.

Measures that use existing administrative data to assess the intensity of EOL care in patients with cancer have been published previously.¹⁵⁻¹⁷ In one study,¹⁸ putative benchmarking standards and statistical variation were evaluated. A variety of indicators using Medicare claims from more than 48,000 cancer deaths in 11 regions of the United States were based on the Surveillance, Epidemiology, and End Results database.^{19,20} Benchmarks were calculated based on the top-performing decile in each indicator. One follow-up study applied these measures to objective data documenting EOL practices that occurred in 264 cancer deaths at a Veterans Administration medical center.²¹ In another study, somewhat different benchmarks for EOL care were applied to a community oncology practice.²²

The primary purpose of this study was to evaluate our data and define the EOL cancer practices in WC. These data are

unique in that they are community initiated, have integrated data not measured in other studies, and are repeatable. It is our goal that these data will provide feedback to those who care for patients with cancer, thus encouraging them to provide more concurrent palliative and hospice care in a more timely fashion.

Methods

Study Design

In this retrospective death study, we measured the intensity of EOL cancer care in WC using published performance guidelines.¹⁷ Existing administrative data from cancer deaths were examined. The intensity of EOL care in these patients was then measured and benchmarked against these guidelines. Additional information obtained included general demographic information, proportion receiving radiation therapy (XRT) in the last 14 days of life, proportion starting XRT in the last month of life, and survival data.

Patients

Our population consisted of 942 analytic patients from the PRMC Cancer Registry who died in calendar years 2004 to 2008 and lived in WC. Analytic patients are defined by the American College of Surgeons as those who received their initial diagnosis and/or received part or all of first-course treatment or a decision not to treat and/or were transferred at the reporting facility.²³ All reported hospital-related events including emergency room visits, ICU admissions, and hospital deaths occurred at PRMC. This review should have captured most relevant care.

None of the patients in this study are living. They are not classified as human subjects, and institutional review board review was therefore not required. However, to comply with the National Institutes of Health privacy and research policies,²⁴ we stipulate that the deceased patients' protected health information was sought solely for research purposes. Decedents' protected health information was necessary for this research project, and documentation was provided from the cancer registry showing that these individuals are indeed dead.

Data Collection

The RAHCI/PRMC patient data were obtained using METRIQ (Elekta, Stockholm, Sweden). Case findings were accomplished by review of all pathology reports, cytology reports, and medical records coded malignant per the International Classification of Diseases, ninth revision. Pathology and cytology reports with a malignant diagnosis were then provided to the cancer registry.

The cancer registry staff reviewed the randomly selected medical records. The review was accomplished using RAHCI and CH electronic medical records (Horizon Patient Folder [McKesson, San Francisco, CA] and Allscripts [Allscripts Healthcare Solutions, Chicago, IL], respectively). The registry staff also manually reviewed outpatient records at the appropriate physicians' offices to obtain information not available in the medical record at PRMC. After completion of each case report

form, a unique anonymous identifier was applied to each form. The coded file linking these identifiers to patients is maintained in a computer password-protected file that can be accessed only by the cancer registry and cancer institute directors.

This study included all analytic patients who resided in WC and were accessioned during the time period of calendar years 2004 through 2008. WC is defined by the following zip codes: 21801, 21802, 21803, 21804, 21810, 21814, 21822, 21826, 21830, 21837, 21840, 21849, 21850, 21852, 21856, 21861, 21865, 21874, and 21875. Patients were randomly selected from registry data entered before April 10, 2010.

Statistical Analyses

In an effort to reduce the probability of introducing sampling bias, a conservatively large sample size of 390 was calculated based on a hypothetical confidence level of 99% of potential parameters to be compared, rather than the more typical 95%. The 99% confidence level was used to calculate a sample size that would present results with at most a 5% margin of error. To maximize the sample size within these parameters, it was assumed that the response distribution was 50%. For survival, the Mood's median test was used to compare median survival between hospice and nonhospice. The sample was selected using randomly generated integers from Minitab statistical software (State College, PA). Confidence level and margin of error were calculated using standard formulas from the Web tool provided by Creative Research Systems (Petaluma, CA).

Statistical analyses of the data included generation of descriptive statistics for the indicators for comparison against published benchmarks.¹⁷ Furthermore, univariate analyses were generated to explore the significance of relationships between variables as well as within and between population subsets

Table 1. Patient Characteristics

Characteristic	Total (N = 390)		Hospice (n = 211)		No Hospice (n = 179)	
	No.	%	No.	%	No.	%
Sex						
Male	204	52	112	53	92	51
Female	186	48	99	47	87	49
Mean age, years	—		70		70	
Median survival from diagnosis, months	—		8.4		5.8	
Primary cancer site						
Lung	134	34	82	39	52	29
Colorectal	49	13	26	12	23	13
Other noncolorectal GI	47	12	24	11	23	13
Hematologic	30	8	18	9	12	7
Pancreatic	25	6	13	6	12	7
Breast	15	4	7	5	8	4
Gynecologic	13	3	6	3	7	4
Prostate	7	2	5	2	2	1
Other	70	18	30	13	40	22

Table 2. Intensity-of-Care Indicators

Indicator	Benchmark*	Performance	No.	99% CI (% yes)
Proportion receiving chemotherapy in last 14 days of life	< 0.10	0.08	390	0.046 to 0.118
Proportion starting new chemotherapy in last month of life	< 0.02	0.03	390	0.014 to 0.064
> One emergency room visit in last month of life	< 0.04	0.02	389	0.007 to 0.047
Admission to ICU in last month of life	< 0.04	0.08	390	0.046 to 0.118
Death in acute care hospital	< 0.17	0.26	390	0.204 to 0.320
Admission to hospice	> 0.55	0.54	389	0.475 to 0.606
Death < 3 days after admission to hospice	< 0.08	0.19	211	0.125 to 0.268
> One hospitalization in last month of life	< 0.04	0.11	389	0.073 to 0.157
Received XRT in last 14 days of life	N/A	0.05	390	0.029 to 0.090
Started XRT in last month of life	N/A	0.04	390	0.021 to 0.078

Abbreviations: ICU, intensive care unit; NA, not applicable; XRT, radiation therapy.

* Indicator benchmarks per Earle et al.¹⁸

using standard statistical tests (ie, χ^2 and Fisher's exact tests) as appropriate.

Results

Baseline Patient Characteristics

General demographic information, the proportion of patients admitted to hospice within each cancer type, and whether they were referred to hospice are listed in Table 1. Side-by-side comparisons are provided to compare the population subsets that were and were not admitted to hospice. Median hospice length of stay was 14 days. The mean length of stay was 46 days.

EOL Care

The intensity of EOL care in our retrospective sample of deceased patients was evaluated using the eight published indicators, their associated benchmarks, and 99% CIs (Table 2). Four intensity-of-care indicators significantly exceeded the benchmarks. They included: ICU admission in the last month of life, > one hospitalization in the last month of life, hospital death, and hospice admission < 3 days before death. There are no benchmarking data available for the two XRT indicators reported in Table 2.

As seen in Table 3, hospice admissions were associated ($P < .001$) with fewer ICU admissions (2% v 13%) and reduced number of hospital deaths (2% v 54%). The P values for other pairs of indicators were all $> .05$ and are therefore not shown. Despite receiving less aggressive EOL care, patients admitted to hospice did not have significantly different survival than those who were not, with median survival from diagnosis to death at 8.4 months with hospice admission and 5.8 months without (Mood's median test $P = .11$).

Discussion

This study sought to evaluate community data to improve care for our patients with incurable cancer. The only overall difference noted between our patient sample and the American Cancer Society demographic data was our low number

Table 3. Associations Between Hospice Admission and Intensity-of-Care Indicators

Indicator	Hospice Admission				P *
	Yes		No		
	No.	%	No.	%	
Admission to ICU in last month of life					< .001
Yes	6	2	24	13	
No	205	98	155	87	
Death in acute care hospital					< .001
Yes	5	2	96	54	
No	206	98	83	48	
> One hospitalization in last month of life					.088
Yes	18	8.5	25	14	
No	193	91.5	154	86	

Abbreviation: ICU, intensive care unit.

* Per χ^2 test of association.

of prostate cancer deaths.²⁵ Although our data are retrospective, the patient characteristics of the subsets hospice and no hospice (Table 1) were similar in age, sex, survival, and tumor type. Four of the eight indicators of intensity of EOL cancer care (multiple EOL hospitalizations, EOL ICU use, hospital death, and late hospice admission) significantly exceeded benchmarks in our sample population (Table 2). The two XRT indicators did not have associated benchmarks, although the results were similar to chemotherapy data. Hospice admission did not significantly alter survival and was associated with reduced probabilities of ICU admission at EOL and hospital death (Table 3).

In this era of personalized cancer care, the model of simply applying one line of antineoplastic therapy after another in the setting of incurable disease can no longer be supported by objective data. In many cases, late-line cancer therapy is provided without clear evidence of benefit, yet with the possibility of toxicity or detriment to QOL. Measuring benefit as disease response or time to progression may not result in improved

QOL or survival.²⁶ Approximately one in three patients are referred to hospice within the last week of life and one in 10 within the last day. These late referrals translate into increased unmet care needs.⁶

Hospice care is designed to provide palliative care to terminally ill patients and their families. This includes meeting their physical, social, emotional, and spiritual needs.¹⁹ Emerging evidence suggests that realistic conversations between physicians and patients with metastatic cancer regarding prognosis and the benefits of hospice and palliative care occur late in the course of illness or not at all.²⁶ A retrospective review of Medicare paid claim databases demonstrated a survival benefit with hospice care, particularly in lung, pancreatic, and colorectal cancers.²⁷ A recent randomized prospective trial of early palliative care in patients with metastatic lung cancer showed better QOL, fewer depressive symptoms, and improved survival in the palliative care group.^{28,29}

There is a growing body of evidence indicating that hospice admission is associated with decreased health care costs among patients with cancer.⁸ The ability to directly measure health care costs from diagnosis to death in our patients who were and were not referred to hospice would have been a valuable addition to our study. Unfortunately, cost data were not available during the time period of our study. Currently, Maryland is the only state with a health care commission (ie, the Maryland Health Service Cost Review Commission).³⁰ This commission regulates hospitals similarly to public utilities. It establishes charges per patient case, and all payers must pay in accordance with these charges. As a result, actual costs of hospital care may not directly correlate with hospital charges to payers. Actual costs are now being captured and can be used in subsequent studies.

Early concurrent palliative care and earlier hospice admission may improve QOL as a result of better symptom management and the avoidance of aggressive and/or toxic therapies at EOL.³¹ Hospital deaths and ICU admissions within the last month of life in our study may represent surrogates for reduced QOL and increased health care costs. Future studies need to look at whether hospice is the intervention that reduces aggressive EOL care or whether patients who accept hospice would have opted for less aggressive care anyway.

The data suggest therapeutic opportunities to improve the quality of EOL cancer care in our community. After reviewing the results of our study, we are forming a task force of oncologists and other health care professionals at our facility to evaluate the results of our EOL cancer study. The goal of this task force is to develop and implement an action plan that will improve EOL cancer care in our community. The final plan decisions have not yet been established at the time of this publication. However, two plan elements are already being performed. First, our data have been presented to the medical staff in several forums. Measuring and sharing performance data with physicians may result in some improvements in EOL care.^{15,16} Second, the Education in Pal-

liative EOL Care curriculum from the American Medical Association is being taught to the medical staff with emphasis on oncologists at three to four modules per year. RAHCI has participated in QOPI since 2008, and the EOL module is under consideration for activation. Also under consideration is the implementation of an oncology medical home modeled after a southeastern Pennsylvania private practice,³² where the medical oncology practice becomes the central coordinator of care throughout all phases of treatment, from diagnosis to survivorship. This plan should provide for early referral of patients who may benefit from concurrent palliative care and earlier transition to hospice services when patients no longer have a reasonable probability of benefit from antineoplastic therapies. It is our hope that this study will result in a new model of care for patients with cancer at EOL and their families that can be integrated within the existing health care structures of our community. After implementation of the plan, we will again measure our performance using the same benchmarks.

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