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Does gynecologic malignancy predict likelihood of a tertiary palliative care unit hospital admission? A comparison of local, provincial and national death rates

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ABSTRACT

Objective: The purpose of this study was to determine whether the presence of gynecologic malignancies predicts the likelihood of a tertiary palliative care unit hospital admission.

Method: In this study, patients admitted to a specialized tertiary palliative care unit (TPCU) with gynecologic malignancies were compared to national and provincial death rates to determine if gynecologic malignancy predicts admission, and subsequent death, in a TPCU.

Results: Eighty-two gynecologic cancer patients were admitted to our TPCU over the 5- year study period. Out of all cancer deaths in the TPCU, death from ovarian cancer was 3.7% compared with 2.4% ($p = 0.0068$) of all cancer deaths in Manitoba and 2.3% ($p = 0.0043$) of all cancer deaths in Canada. Cervical cancer accounted for 1.7% of all our patients deaths compared with 0.7% ($p = 0.0001$) provincially and 0.6% ($p = 0.0001$) nationally. Uterine cancer deaths were not significantly different from the provincial and national death rates, whereas vulvar and fallopian cancers were too rare to allow for statistical analysis.

Significance of Results: Gynecologic cancers may be predictive of admission to a palliative care unit.

KEYWORDS: Palliative care, Gynecologic malignancies, Admission, Death rates

INTRODUCTION

Several palliative care studies have indicated a desire of palliative patients to die at home (Dunlop et al., 1989; Townsend et al., 1990; Karlsen & Addington-Hall, 1998). Nevertheless, significantly fewer patients die at home than their preferences would indicate (Townsend et al., 1990; Karlsen & Addington-Hall, 1998). Over the last decade, researchers have sought to determine which factors predict death in hospital, at home, or in hospice.

When researchers explored factors that might correlate with a death at home, they considered both severity of symptoms and primary diagnosis. A review of the literature finds contradictory evidence about whether patients with severe symptoms at the end of life may be more likely to end up in hospital (De Conno et al., 1996, Izquierdo et al., 2001; Fukui et al., 2003; Gomes & Higginson, 2006).

However, when looking at primary cancer diagnosis as a predictor of in-hospital death, researchers did find an increased likelihood of death in hospital for

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patients dying of hematologic malignancies (McCusker, 1983; Bruera et al., 2003; Constantini et al., 1993; Hunt et al., 1993).

The hematologic studies do not specify the type of ward where these patients die, but suggest that patients die in hospital because of inpatient chemotherapy regimens and related complications (Fukui et al., 2003). If this is accurate, it is likely that many patients are dying on a medical ward and less likely that they are dying in palliative care units or hospices.

The results for solid tumors predicting death in hospital are less clear. A systematic review by Gomes has shown that the type of solid tumor primary malignancy has no effect on the likelihood of death in hospital (Gomes et al., 2006). However, previous studies have shown breast and gynecologic cancer patients were more likely to die in hospital and colorectal cancer patients were more likely to die at home (Mann et al., 1993; Higginson et al., 1998), but once again, these studies make no reference to the ward in hospital.

Previous data from our research group indicated that a disproportionate number of gynecologic oncology patients were being admitted to our palliative care unit for end-of-life care (Pilkey & Daeninck, 2008). We are not aware of any studies that specifically indicate that gynecologic malignancies predict death in a specialized hospital-based tertiary palliative care unit (TPCU).

OBJECTIVE

The purpose of our study was to compare the prevalence of gynecologic primary cancer diagnoses in patients admitted to a TPCU at St. Boniface General Hospital (SBGH) in Winnipeg, Manitoba, Canada with provincial and national cancer deaths rates. The Winnipeg Regional Health Authority runs a comprehensive palliative care program that includes a home care program, two TPCUs, and two hospices. The TPCUs are set up for acute symptom management in palliative care patients, whereas the hospices provide care for palliative care patients who cannot return home and who are relatively asymptomatic. It was our hypothesis that gynecologic cancer admissions to the inpatient unit were higher than the provincial and national cancer death rates for these same gynecologic malignancies, thereby being predictive of an inpatient TPCU admission.

METHOD

Study Design

The study consisted of a retrospective chart review including data over a 5-year period, from July 1, 2001 to June 30, 2006. Ethics approval was obtained from the Health Research Ethics Board (HREB) at the University of Manitoba.

The initial analysis reviewed all patients admitted with diagnoses of cancer at the St. Boniface palliative care unit. Data were obtained through the computerized health records database by using the International Coding of Diagnoses (ICD) classification to determine cancer admissions to the TPCU. Admissions that had codes ICD 9 and 10 represented the gynecologic palliative care admissions. The coding identified many patients with uterine, cervical, and ovarian cancers. It also identified a few patients with fallopian tube cancer and vulvar cancer, and patients with cancer of the female genital tract not otherwise specified.

Based on this initial screen, charts with the ICD 9 and 10 markers were then pulled to verify or clarify the diagnoses, and to determine whether each admission corresponded to an individual patient. The gynecologic cancer diagnoses for uterine, cervical, ovarian, and "other" in the palliative care unit were then compared with provincial and national cancer death rate data. The "other" category included the patients with fallopian tube and vulvar cancers. The national and provincial death rates were available from the National Cancer Institute of Canada and the Canadian Cancer Statistics. All patients with a gynecologic cancer diagnosis admitted to the TPCU at SBGH between July 1, 2001 and June 30, 2006 were included. Patients who died from conditions unrelated to their primary cancer were excluded. Patients with a primary cancer that involved secondary gynecologic metastases (i.e., melanoma with metastases to the vulva) were also excluded.

Analysis

Chart reviews were performed by the primary investigators. Statistical consultation and analysis was provided through the St. Boniface Office of Clinical Research. The prevalence of gynecologic cancer diagnoses in patients admitted to the SBGH palliative care unit was compared with provincial and national cancer death rates for the comparable cancer diagnoses. This was based on projected death rates from the National Cancer Institute of Canada and Canadian Cancer Statistics. We used the number of patients, not the number of admissions, for our comparative calculations.

Differences between the TPCU rates and provincial and national death rates were assessed by the test of proportion, which compares sample and populations rates and is expressed as a z-score. Discrepancies were defined as TPCU death rates that fell outside the 95% confidence interval of the published

provincial and national death rates, with a z score $>$ 1.96 significant at $p < 0.05$. Two analyses were performed. The first compared the TPCU admission data with the provincial death rate data for uterine, cervical, and ovarian cancers. The second analysis compared the TPCU admission data with the national death rate for the same malignancies. Because of the small numbers of patients who fell in the "other" category, and the lack of national and provincial comparators, data in this category were not analyzed.

RESULTS

There were 1731 admissions (1536 patients) to the SBGH inpatient palliative care unit, from July 1, 2001 to June 30, 2006. Further analysis of these numbers revealed 1365 admissions (1201 patients) when solely accounting for cancer patients. Therefore, cancer diagnoses represented 88.9% of all admissions to our TPCU during this time period.

Overall, there were 108 gynecologic cancer admissions, consisting of 82 distinct patients. Gynecologic cancer patients in our TPCU made up 7% of our total cancer admissions.

The ovarian cancer admissions accounted for 54% of the gynecologic admissions to the TPCU and 54% of the gynecologic patients. Cervical cancer accounted for 26% of the gynecologic admissions and 24% of the patients, whereas uterine cancer accounted for 14% and 17% respectively. There were two identified cases for which two gynecologic diagnoses, uterine and ovarian cancers, were recorded for the same patient. We were unable to clarify whether this was the result of a transcriptional error or whether in fact these patients had two separate primary cancers. In these two cases, one patient was assigned to the uterine group, whereas the other was assigned to the ovarian group for analysis (Table 1).

The ages for the patients admitted to the TPCU ranged from 46–94 years (median 66 years) for the ovarian cancers, 34–83 years (median 54 years) for the cervical cancers, 47–92 years (median 67 years) for the uterine cancers, and 29–89 years (median 65 years) for the others. The vast majority of these gynecologic cancer patients were admitted to the unit for physical symptoms and only seven patients (9%) had social reasons listed as their primary reason for admission. Most of our patients also lived with family caregivers. Only 31 patients (38%) lived alone, and of these, 21 had a diagnosis of ovarian cancer.

Out of this gynecologic patient population, only seven patients did not die in the TPCU during one of their admissions. Of these seven, three were transferred directly to other palliative care facilities, where they died. Three remaining patients died while still registered in the city-wide palliative care program, but were not at the St. Boniface TPCU at the time of death, and one was still alive at the end of the study.

The percentage of patients dying from ovarian cancer, out of all cancer deaths in our TPCU, was 3.7%, compared with 2.4% ($p = 0.0068$) of all cancer deaths in Manitoba, and 2.3% ($p = 0.0043$) of all cancer deaths in Canada. Cervical cancer was also overrepresented in our unit. Of all our cancer patients, 1.7% died from cervical cancer compared with 0.7% ($p = 0.0001$) provincially and 0.6% ($p = 0.0001$) nationally. Our rate of uterine cancer death, 1.2% of our cancer deaths, was not significantly different from the provincial and national death rates of 1.2% and 1.0% respectively. Vulvar and fallopian

Table 1. *Numbers of admissions and patients admitted to the St. Boniface General Hospital Tertiary Palliative Care Unit*

All Patients	Admissions 1731	Patients 1536
All Cancers	Admissions 1365	Patients 1201
Gynecologic Cancers	Admissions (Percentage of gynecologic cancers)	Patients (Percentage of gynecologic cancers)
Ovarian	57 (53%)	43 (52%)
Cervical	28 (26%)	20 (24%)
Uterine	14 (14%)	13 (16%)
Other gynecologic	9 (8%)	6 (7%)
All gynecologic	108	82

Note: This table shows the total numbers of admissions and patients, the numbers of patients and admissions with cancer, and the numbers of patients and admissions with gynecologic cancers at the St. Boniface General Hospital Tertiary Palliative Care Unit over the 5-year study period.

Table 2. *A comparison of the St. Boniface General Hospital Tertiary Palliative Care Unit (TPCU)gynecologic cancer patient admissions with provincial and national death rates from 2001 to 2006*

Type of Cancer	Gynecologic Cancers			All Cancers
	Ovarian	Cervical	Uterine	
Number of patients admitted to TPCU (*n*)	43	20	13	1201
Percentage of all cancer patients admitted to TPCU (%)	3.6	1.7	1.1	100
Number of cancer deaths in Manitoba (n)	371	108	187	1199
Percentage of all cancer deaths in Manitoba (%)	2.4	0.7	1.2	Not calculated
z score	2.71	4.13	0.32	
p value	0.0068	0.0001	0.7490	
Number of cancer deaths in Canada (n)	9240	2433	4153	405,575
Percentage of all cancer deaths in Canada (%)	2.3	0.6	1.0	Not calculated
z score	3.00	4.93	0.35	
p value	0.0043	0.0001	0.7264	

Note: This table compares the percentage of patients with gynecologic cancers admitted to the St. Boniface General Hospital TPCU with the percentage of patients dying from gynecologic cancers within the province of Manitoba and the country of Canada over a 5-year period.

cancers admissions to the TPCU were too rare to allow for statistical analysis (Table 2).

DISCUSSION

Our study indicates that a disproportionate number of gynecologic oncology patients were admitted to the SBGH inpatient TPCU from July 1, 2001 to June 30, 2006 for end-of-life care. We were able to show that palliative care patients with ovarian and cervical cancers were over-represented in the unit and were dying more commonly in the palliative care unit than would have been anticipated. Our findings suggest that a diagnosis of cervical and ovarian cancer could be predictive of an admission to, and subsequent death in, a specialized hospital-based TPCU.

The city of Winnipeg also has a specialized Women's Hospital staffed by gynecologic oncologists, some with palliative care specialty training. Many women remain under the care of their oncologist and die on the wards there, never making it home or to a palliative care facility. It is, however, possible that some of these women are being managed by physicians who feel less comfortable providing palliative care, perhaps resulting in a disproportional referral and subsequent admission rate.

A second possible explanation for the results could be that women are less likely to have caregivers who feel able to care for their loved ones at home. This may be because women have traditionally assumed the role of caregiver in many families. Husbands may find the caregiving role more difficult to assume because of inexperience or lack of societal role models and supports. In our study, most of our patients lived with family caregivers; however they were still dying in the TPCU. This corresponds to the study of a gynecologic oncology service in a tertiary care facility, in which more patients died in hospital. Most patients in this study were married with husband caregivers, suggesting that women patients do not benefit from being married in terms of receiving help with a home death (Mann et al., 1993).

In addition, women tend to live longer than men, meaning that many women no longer have husbands to assume the caregiver role. Higginson et al. demonstrated home death is more likely in men, patients aged $\leq$75 years, and in those with colorectal cancer, whereas home death is less likely in women, the elderly, and patients with breast cancer (Townsend et al., 1990; Higginson et al., 1999). As Higginson explains, "Given that the average age of death from cancer is increasing, along with the demographic changes of an increase in those aged over 85 years and women in particular, these trends may limit or hinder the ability to care for people at home" (Higginson et al., 1999).

A third possible explanation may be attributable to the inherent nature of these malignancies and the necessity for more complex symptom management. Most of our patients were admitted with physical symptoms, primarily pain, nausea, vomiting and possible small bowel obstruction. Our findings are supported by another study that examined gynecologic cancer inpatient hospitalizations and deaths, with the most frequent gynecologic admissions being for ovarian and cervical cancer. The most common symptoms were pain, nausea, and/or emesis, and suspected bowel obstruction (Trunca et al., 1981). The development of bowel obstruction is common in patients with gynecologic cancer, occurring in up to 36% of patients with advanced or recurrent ovarian

cancer (Dalrymple et al., 2002). Although these symptoms can be managed in the home through our home care program, many patients with suspected bowel obstructions opted for TPCU admission because of the severity and overwhelming nature of the symptoms. Poor control of severe symptoms has been previously linked with the increased likelihood for admission (Higginson et al., 1999).

Although our study did not explore the socioeconomic factors in great detail, a fourth possible explanation may be linked to socioeconomic factors. This may be an especially important factor in the cervical cancer group, where late presentation and low screening rates for cervical cancer in populations with a lower socioeconomic status has been shown to increase mortality (Movva et al., 2008; Brookfield et al., 2009). We only looked at whether patients were living alone and whether social factors were recorded as a primary indication for admission. In our study, this did not seem to be a large factor, as only four of our cervical cancer patients lived alone and only one was admitted primarily for social reasons. However, because the TPCU is often seen as a symptom control unit, referrals to the unit may be biased toward patients with physical and not social or economic needs. Our study did not explore economic factors at all. These economic factors may have also played an important role. Patients and families with limited financial resources may not be able to help provide support for a home death. In fact, previous studies have indicated a decreased likelihood for death at home for cancer patients who have a lower socioeconomic status, or belong to an ethnic minority (Higginson et al., 1999; Fukui et al., 2003).

Limitations

Our study had several important limitations. First, we conducted a retrospective chart review relying on the ICD codes to identify potential patient charts. It is possible that some patients may have been lost through miscoding. Once the charts were identified, they were examined in detail to determine the primary cancer type, including reviewing pathologic records if possible. Although the quality of charting is less likely to have been an issue for a broad category such as diagnosis, there were two identified cases for which two gynecologic diagnoses were recorded for the same patient. We were unable to clarify whether this was the result of a transcriptional error or whether in fact these patients had two separate primary cancers. Because this was an uncommon event, we feel that this error was unlikely to have significantly affected the results.

In this study, we tracked individual patients rather than the number of admissions, in order to draw comparisons between our data and published cancer death rates. As is evident from the differences between the admission and patient numbers, not all admissions resulted in deaths and some patients were admitted more than once. There were times when the patients recovered from the symptomatic event that led to their admission, and were able to return home.

There were only seven patients who did not eventually die in our TPCU. These patients were included in the analysis, as they were all admitted to the TPCU with a diagnosis of gynecologic malignancy. Two of these died after being transferred directly from our unit to hospices, whereas one died after a direct transfer to another TPCU within our city. Of the four remaining patients, one patient died at home with ovarian cancer. One was discharged home and then readmitted to the other TPCU within our city where she died, and one was discharged home and then readmitted to a hospice, where she died. The final patient, with cervical cancer, has had numerous further hospital admissions to our unit and other wards but has not yet died. When we re-analyzed our data, without the two patients who did not die in a TPCU or in hospice, our results still remained statistically significant.

CONCLUSIONS

The identification of trends, such as admission frequency and place of death, in palliative care is an important first step in the research aimed at improving quality at the end of life. As our population ages, it will become increasingly important to develop palliative care programs that can help populations who wish to die at home to do so, despite difficult diagnoses and social factors. Although we currently lack a clear understanding for the discrepancies noted between our TPCU, provincial, and national death rates, it is likely that the reasons we postulated in the previous Discussion section played a significant role. It is also possible that a disproportionate number of patients with gynecologic malignancies are being referred to palliative care for reasons that have yet to be fully explored. We are currently in the process of examining these reasons more fully in our ongoing research on this interesting topic.

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