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Medical comorbidity and psychotropic medication fills in older adults with breast or prostate cancer

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Abstract

Background—Previous research has shown that as people age, distress decreases despite an increase in prevalence of medical comorbidity. This could be due to increased use of psychotropic medications with comorbidity. We tested this hypothesis in older adults.

Methods—Information from medical records of older adults (65 to 99 years of age) in the following groups was collected: women with breast cancer (n=2,359), women without any cancer diagnosis (n=27,161), men with prostate cancer (n=2,686), and men without any cancer diagnosis (n=21,014). We collected fills of antidepressant or sedative medications, diagnosis of depression in the year of cancer diagnosis, and Charlson Comorbidity Index from the year before cancer.

Results—Women with breast cancer were more likely to fill psychotropic prescriptions (both $p < .02$) or be diagnosed with depression ($p < .001$) than women without cancer. Men with prostate cancer were more likely to fill these prescriptions or receive a diagnosis of depression than men without cancer ($p < .05$). Charlson was related to increased odds of filling both types of medication in women with breast cancer and men with prostate cancer ($p < .001$). Comorbidity was related to greater odds of receiving a depression diagnosis in men with prostate cancer ($p < .001$) but not women with breast cancer ($p > .15$).

Conclusions—Older adults with breast or prostate cancer are more likely to fill psychotropic medication prescriptions and receive a depression diagnosis than those without cancer. Comorbidity increased the likelihood of medication fills in older adults with cancer. As this population experiences polypharmacy, non-pharmacologic treatments for depression may need to be considered.

Keywords

multimorbidity; neoplasm; depression; anxiety; cancer

Introduction

People with cancer frequently experience depression and anxiety following their diagnosis (1). However, age is inversely related to distress in people with cancer and in the general

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population despite an increase in medical conditions and functional limitations that are typically associated with distress (2). One explanation is that as people age and develop medical conditions, they are better able to manage distress (2, 3) and this could include seeking out treatment for the distress resulting from medical conditions. This has been suggested as an explanation for why some studies comparing cancer survivors to controls do not show differences in distress, that cancer survivors are able to access treatment and reduce distress (4).

Most prior studies of the relationship between cancer and antidepressant prescriptions show that medical comorbidity is related to greater odds of antidepressant prescriptions (5–7) although this effect may disappear for people more than five years post-diagnosis (4). These studies did not investigate these relationships in older adults, who bear a greater burden of medical comorbidity and polypharmacy (8, 9), and few focused on the relationship of comorbidity and medications that are used to treat anxiety. As anxiety may be a longer-lasting problem for people with cancer (10), investigating both antidepressants and medications specific to anxiety could better inform clinical practice.

The current study examined the relationship between medical comorbidity and the use of antidepressants and sedatives in older adults with breast or prostate cancer. First, we tested whether comorbidity was related to antidepressant and sedative medication use, possibly explaining the lack of relationship of comorbidity and distress. If people are able to access treatment for distress as they develop comorbid conditions, than older adults with cancer should have increased use of treatment and among those with cancer, those with more comorbidities should also have increased use of treatment. Second, we tested whether cancer diagnosis and comorbidity was related to depression diagnosis to determine whether comorbidity could have led to increased medication use through increased distress.

Methods

Sample and Data Collection

For this study, we used data from electronic medical records that was extracted as part of a prior study on physical activity in older adults (11)(65 to 99 years old) receiving care from a health system in Washington State, between 2005 and 2011. We restricted our analysis to people who had a diagnosis of breast or prostate cancer during the defined period using International Classification of Diseases-9th edition (ICD-9) diagnosis codes and to the first year in which the cancer diagnosis was recorded. For the non-cancer comparison group, we restricted this to older adults from the sample who had no recorded cancer diagnosis between 2005 and 2011 and used data from the first available year. We extracted data on the number of prescription fills for antidepressants (selective serotonin reuptake inhibitors, serotonin and norepinephrine reuptake inhibitors, tricyclics, monoamine oxidase inhibitors) and sedatives (sleep medications and benzodiazepines) within the year of cancer diagnosis. We also extracted information on age, race/ethnicity, comorbidity and whether a person had an ICD-9 diagnosis for depression and anxiety. The institutional review board approved study procedures before the study was conducted.

Comorbidity Measurement

We examined comorbidity for the year prior to cancer diagnosis using data extracted from the medical records. The total score of the Charlson Comorbidity Index (Charlson) from the year prior to cancer diagnosis was used (12). The Charlson sums 15 medical conditions, weighting the conditions by severity. For example, mild liver disease has a lower score than more severe liver disease. Charlson scores can range from 0 to 35 with higher scores indicating greater burden of comorbidity. As categories or cut points are often used, we also examined categories of the Charlson. Which categories of the Charlson are used can affect whether an effect is observed and we used categories that were shown to be important in predicting mortality (0–1, 2, 3 and 4+, (13)). Due to low sample size, we collapsed the 0 and 1 scores.

Analyses

Logistic regression was used to predict the likelihood of filling an antidepressant or sedative medication during the index year or whether a person had a depression diagnosis. Too few people (~1%) had anxiety diagnoses so these were not examined. Covariates in all models were age and race/ethnicity. The first set of analyses compared women with breast cancer to women without a cancer diagnosis and men with prostate cancer to men without a cancer diagnosis. The second set of analyses examined the relationship of comorbidity to depression diagnosis, antidepressant and sedative fills in people with cancer. Separate analyses were run for women with breast cancer and men with prostate cancer. The first set of models used the Charlson score. The second set of models used the Charlson categories mentioned above. Alpha was .05.

Results

A total of 2359 women with breast cancer and 2686 men with prostate cancer were included in the analyses. For the comparison group, 27,161 women without a cancer diagnosis and 21,014 men without a cancer diagnosis were included. Descriptive statistics are reported in Table 1. Overall, 24% of women with breast cancer and 14% of men with prostate cancer filled an antidepressant during the year of diagnosis. For sedatives, 21% of women with breast cancer and 12% of men with prostate cancer filled a prescription during the year of diagnosis. Interestingly, 5.2% of women with breast cancer and 3.4% of men with prostate cancer had a depression diagnosis, far lower than the number filling antidepressants or sedatives.

When comparing people with cancer to people without a cancer diagnosis, results showed older adults with cancer were more likely to fill either an antidepressant or sedative prescription and were more likely to receive a depression diagnosis (see Table 2). Women with breast cancer were more likely to fill an antidepressant ($p=.013$) or sedative ($p<.001$) prescription than women without a cancer diagnosis and were more likely to receive a depression diagnosis ($p<.001$). Men with prostate cancer were also more likely to fill an antidepressant prescription ($p=.044$) or a sedative prescription ($p<.001$) than men without a cancer diagnosis and were more likely to receive a depression diagnosis ($p<.001$).

We next examined the relationship of comorbidity to depression diagnosis, antidepressant and sedative fills in people with cancer. For women with breast cancer, the Charlson was significantly related to greater odds of filling an antidepressant or sedative prescription ($p's < .001$). However, the Charlson categories were not significantly related to medication fills (all $p's > .10$) except a Charlson score of 4 or higher was related to greater odds of filling an antidepressant ($p = .028$). Neither measure of comorbidity, Charlson score or Charlson categories, was related to depression diagnosis in women with breast cancer (all $p's > .15$). For men with prostate cancer, the Charlson was also significantly related to greater odds of filling an antidepressant or sedative prescription (both $p's < .001$). The two highest Charlson categories, score of 3 or score of 4 or higher, were both related to greater odds of filling an antidepressant or sedative prescription (all $p's < .03$) in men with prostate cancer. However, in men with prostate cancer, having a Charlson score of 2 was not related to greater odds of medication fills compared to a Charlson score of 0 or 1 ($p = .072$). Among men with prostate cancer, the Charlson score was related to higher odds of receiving a depression diagnosis ($p < .001$) and men with a score of 4 or higher on the Charlson were more likely to receive a depression diagnosis than men with a score of 0 or 1 ($p = .040$).

Discussion

Overall, we found that breast or prostate cancer diagnosis was related to greater odds of filling antidepressant or sedative medications and to a diagnosis of depression. This suggests that a cancer diagnosis could lead to increased medication use through increased distress and could partially explain why self-report measures do not consistently show increases in distress. We also found that a greater burden of comorbidity before the cancer was significantly associated with greater likelihood of antidepressant or sedative fills. When the Charlson score was compared to depression diagnosis, it was only related for men with prostate cancer but not women with breast cancer. Rates of antidepressant medication usage (24% breast cancer; 14% prostate cancer) and sedative medication usage (21% breast cancer; 12% prostate cancer) were similar to rates reported in other studies (22.6% for hypnotics, (14); 25% for antidepressants, (5); 29% any medication, (4)) for older women with breast cancer but older men with prostate cancer tended to have lower usage rates. Our rates of depression (5.2% for breast cancer and 3.4% for prostate cancer) were lower than has been reported with a structured clinical interview (1); however, our measure reflects both symptom level and whether a provider decided symptoms warranted coding in the medical chart, which likely substantially reduced the rates of depression.

Our results are consistent with other studies showing comorbidity is related to greater odds of using antidepressants and sedatives (5–7) and, for men with prostate cancer, to greater odds of elevated distress (15). This study extends the results to older adults with cancer. Results showing that the categories of the Charlson were not related to medication fills in women with breast cancer are consistent with one study that examined only women with breast cancer and also used Charlson categories (5). Women with breast cancer and comorbidities may have also sought non-pharmacologic treatment such as support groups or individual counseling (16) or the reduced power from the categories may explain the results.

This study supports the hypothesis that as people age and develop comorbid medical conditions, they access more treatment for distress possibly explaining the finding that distress decreases with age despite an increase in medical conditions. However, as comorbidity was unrelated to depression diagnosis but was related to antidepressant and sedative fills in women with breast cancer, this suggests that increased distress might not be the reason for the association of comorbidity and medication in these women. Comorbidities may have led to more contact with the health system (more doctors' appointments, other specialist appointments) and therefore more opportunity for a physician to note depression or anxiety and suggest treatment. However, for men with prostate cancer comorbidity was related to greater odds of depression diagnosis as well as medication use indicating that increased distress (depression diagnosis) may have been the reason for the association of comorbidity and medication use.

This study had several limitations. Data was obtained through electronic health records using ICD-9 codes that may have inaccuracies such as diagnoses not being entered or being entered incorrectly, including psychiatric diagnoses. As this study was secondary data analysis, we did not have data on certain cancer-related variables such as chemotherapy and hormonal treatment and these could affect distress or treatment of distress. Patient-reported distress, use of psychotherapy and some demographic variables were not available including marital and socioeconomic status. Timing of medication use relative to cancer diagnosis was not available, limiting causality inferences. We also were unable to determine if the differences between women with breast cancer and men with prostate cancer was due to gender or cancer site. Our population was predominantly white, limiting generalizability. However, the prevalence of medical conditions was comparable to the general population of older adults (8) and to a sample from the same health system (11). Study strengths were including all older adult members of a health system with cancer so there is no selection bias and an objective measure of medication fills.

Increased use of psychotropic medication has been suggested as a reason for a lack of differences in distress between cancer survivors and controls (4) and this study supports this hypothesis in older adults. However, the association of comorbidity with elevated distress and treatment use in cancer survivors may differ either by gender or cancer type (breast vs. prostate). Given that comorbidity was related to greater use of psychotropic medication, future studies on the relationship of comorbidity and distress in cancer samples should account for treatment. As older adults frequently have multiple medications and comorbidities (8), non-pharmacologic treatments for distress may be an alternative for older adults with cancer to reduce polypharmacy and physicians may consider discussing these options with their patients. These treatments could include referral to counseling or psychotherapy and support groups, depending on patient preference.

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Table 1

Descriptive statistics of the samples of older adults with breast cancer (n=2,359), women with no cancer diagnosis (n=27,161), men with prostate cancer (n=2,686) and men with no cancer diagnosis (n=21,014).

	Mean (SD) or % (n)			
	Breast Cancer	Women, no cancer diagnosis	Prostate Cancer	Men, no cancer diagnosis
Age	76.46 (7.66)	75.84 (8.71)	77.50 (7.75)	73.89 (7.98)
Caucasian	93% (2,199)	87% (23,618)	91% (2,432)	75% (15,793)
Asian	4% (85)	6% (1,552)	3% (74)	4% (888)
Black	3% (61)	3% (740)	4% (117)	2% (470)
Hispanic	4% (102)	4% (993)	2% (43)	1% (294)
Charlson	3.11 (1.84)	.46 (.99)	2.83 (1.71)	.57 (1.09)
	Range: 0–12	Range: 0–12	Range: 0–13	Range: 0–14
Depression Diagnosis	5.2% (123)	3.5% (963)	3.4% (90)	1.8% (388)
Antidepressant fill	24% (565)	21% (5,752)	14% (363)	11% (2,376)
Sedative fill	21% (494)	13% (3,572)	12% (334)	9% (1,885)

Table 2

Results of logistic regressions predicting antidepressant and sedative fills, comparing breast and prostate cancer survivors to same-gender peers. Bold indicates significant results.

	OR	95% CI	P-value
<u>Model 1: Depression Diagnosis</u>			
Breast Cancer	1.464	1.207, 1.775	<.001
Prostate Cancer	1.794	1.414, 2.277	<.001
<u>Model 2: Antidepressant Fills</u>			
Breast Cancer	1.134	1.027, 1.253	.013
Prostate Cancer	1.132	1.004, 1.277	.044
<u>Model 3: Sedative Fills</u>			
Breast Cancer	1.728	1.555, 1.920	<.001
Prostate Cancer	1.416	1.248, 1.607	<.001

Covariates were age and race/ethnicity. OR=Odds ratio, CI=Confidence interval.

Table 3

Results of logistic regressions predicting antidepressant and sedative medication fill from comorbidity. Bold indicates significant results.

Breast Cancer (n=2,359)					Prostate Cancer (n=2,686)				
	OR	95% CI	P-value			OR	95% CI	P-value	
<u>Model 1: Depression Diagnosis</u>									
Charlson	1.069	.975, 1.172	.158		1.240	1.126, 1.366		<.001	
0-1 score (reference)									
2 score	1.171	.416, 3.296	.765		1.085	.380, 3.100		.879	
3 score	1.336	.449, 3.973	.603		1.689	.563, 5.067		.350	
4+ score	1.421	.494, 4.087	.515		3.014	1.052, 8.632		.040	
<u>Model 2: Antidepressant Fills</u>									
Charlson	1.114	1.060, 1.170	<.001		1.176	1.110, 1.247		<.001	
0-1 score (reference)									
2 score	1.141	.670, 1.941	.628		1.563	.884, 2.763		.125	
3 score	1.574	.900, 2.752	.112		2.011	1.103, 3.667		.023	
4+ score	1.836	1.068, 3.157	.028		3.057	1.704, 5.483		<.001	
<u>Model 3: Sedative Fills</u>									
Charlson	1.146	1.089, 1.205	<.001		1.150	1.053, 1.222		<.001	
0-1 score (reference)									
2 score	.939	.551, 1.602	.818		1.747	.950, 3.213		.072	
3 score	1.197	.680, 2.108	.533		2.280	1.204, 4.317		.011	
4+ score	1.574	.914, 2.712	.102		2.874	1.537, 5.377		.001	

Covariates were age and race/ethnicity. OR=Odds ratio, CI=Confidence interval.