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Women with gynecologic malignancies have a greater incidence of suicide than women with other cancer types

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Abstract

To evaluate risk of suicide of women with invasive gynecologic malignancies, the National Cancer Institute's Surveillance, Epidemiology and End Results Program (1973-2007) was queried. Suicide/100,000 women with gynecologic malignancies was compared to that of women with other malignancies; suicide was 30% more likely in those with gynecologic malignancies. Most suicides occurred within 4 years of diagnosis. Better understanding of the descriptive epidemiology of suicide among women with gynecologic malignancies could lead to improved risk assessment, screening, and prevention of this potentially avoidable cause of death.

Keywords

Suicide; distress; gynecologic cancer; women

INTRODUCTION

Suicide is the 11th leading cause of death in the United States with an incidence in the general population of 11.0 per 100,000 people[1]. Multiple studies from around the world have found an even greater risk of suicide among cancer patients[2-12]. In the United States, a study from the Surveillance, Epidemiology and End Results (SEER) program found an overall increased standardized mortality ratio (SMR) from suicide of 1.88 for people with cancer as compared to the general population[9].

It is widely accepted that mental illness, such as depression, is an important predictor of suicidal behavior[13]. Further, perceived burdensomeness and social alienation may also contribute to suicidal behavior[14]. Depression, perceived burdensomeness, and social alienation are psychological states and feelings commonly found among individuals diagnosed with cancer[10]. In fact, available research indicates that individuals diagnosed with cancer are at risk for major depressive disorder with prevalence rates estimated between 6% and 24%[10, 15, 16].

Given that suicide is potentially preventable[17], it is important to identify risk factors and design interventions to reduce the frequency of this significant public health problem among women diagnosed with gynecologic malignancies. Therefore, the purpose of the present

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investigation is to describe the risk of suicide among women with invasive gynecologic malignancies compared to women diagnosed with non-gynecologic malignancies. Further, in order to identify the period during which women with gynecologic malignancies are most at risk for death by suicide, we examined the time period during which women with gynecologic malignancies were most likely to commit suicide. Finally, in order to better understand this behavior, we examined other demographic characteristics of the study population..

MATERIALS AND METHODS

The National Cancer Institute's SEER Program's 17 registries and US population data from 1973 to 2007 were queried to find women whose cause of death was recorded on the death certificate as suicide or self inflicted injury. Patients entered with primary invasive malignancies of the uterine cervix, ovary, uterus, vagina, vulva, or other female genital organs were combined to form the population with gynecologic malignancies. Women with any other invasive malignancy were categorized as having a non-gynecologic malignancy.

SEER is comprised of 17 individual registries and includes 26% of newly diagnosed cancer patients in the United States. SEER*Stat uses the 2000 US standard population based on age from the Census to enable weighting for calculation of age-adjusted statistics. Mortality information is based on death certificate data obtained from the National Center for Health Statistics.[18]

Rates and survival analyses were conducted using SEER*Stat 6.6.2 (Silver Spring, MD). The incidence of suicide per 100,000 for women with gynecologic malignancies was compared with the incidence in women with non-gynecologic malignancies. Relative risk (RR) of suicide over the entire follow up period (maximum of 33 years) and 95% confidence intervals (CI) were calculated using EpiInfo2000 (Atlanta, GA). The percent of patients lost to follow up and the median survival was calculated, and characteristics of the study populations including age, race, and marital status were compared. For the calculation of overall median survival, relative survival was calculated using the Kaplan-Meier method. Using relative survival controls for competing causes of death and adjusts for age[19]. This study was approved by the Institutional Review Board of the University of California, San Diego Medical Center.

RESULTS

During the study period, 219 suicides were reported among 350,962 women with gynecologic malignancies registered in SEER. Incidence of suicide in the gynecologic cancer population was 62.4/100,000 (95% CI = 54.5-71.1). The incidence of suicide among women with non-gynecologic malignancies was 49.0/100,000 (95% CI = 46.3-51.9) during the same period with 1,151 suicides out of 2,322,628 women. Women with gynecologic malignancies were 30% more likely to commit suicide than were women with non-gynecologic malignancies (RR = 1.3, 95% CI = 1.1-1.5)

The mean age of death of the women with gynecologic malignancies who committed suicide was 62.2 years (SD = 14.7 years) and the age of death of those with other malignancies who committed suicide was 64.3 years (SD = 14.4 years). Demographic data for the study population are presented and compared in Table 1. When comparing women who committed suicide with gynecologic malignancies to those with non-gynecologic malignancies, women with gynecologic malignancies who committed suicide were significantly more likely to be white and married. Overall, women with gynecologic malignancies were just as likely to be

white as those with non-gynecologic malignancies, but were slightly more likely to be married.

The majority of women with gynecologic malignancies (52%) committed suicide within 4 years of diagnosis- 23% the first year, 12% the second year, 11% the third year, and 6 % the fourth year.. Among those with non-gynecologic malignancies, more than half of the suicides occurred prior to the 3rd year after diagnosis. The 5-year survival for women with gynecologic malignancies who committed suicide is 43.9% (95% CI 36.8-50.8%) and 34.8% (95% CI 31.8-37.9%) for women with other malignancies who committed suicide. While the chance of survival is lower for women with other malignancies, the difference is not statistically significant. Curves for time-to-death for women who committed suicide are shown in Figure 1.

To evaluate for possible biases intrinsic to the populations, the proportion of patients lost to follow up and the median survival were evaluated. The percent of patients lost to follow up in the group of patients with gynecologic malignancies was similar to those with non-gynecologic malignancies (3.4% vs 2.1%, respectively). The overall median survival of the population of women with gynecologic cancer is 136 months. It is 64 months for those with non-gynecologic malignancies.

COMMENTS

We found that suicide risk is 1.3 times higher among women with gynecologic malignancies as compared to women with non-gynecologic malignancies. While other studies have found that gynecologic cancer patients have a higher risk of suicide than the general population [6, 8]the current study adds new information about risk related to women with non-gynecologic malignancies. We also found that the risk of death by suicide is greatest within the first 5 years after diagnosis with either a gynecologic or non-gynecologic malignancy. This is consistent with the findings of other researchers[5, 6]. However, the finding that women with gynecologic malignancies have a longer median survival than women with non-gynecologic malignancies may be a potential source of bias and should be evaluated further in future research.

Women with gynecologic malignancies who died from suicide were more likely to be white and to be married than women with non-gynecologic malignancies. Suicide research on women in the general population shows that white women are more likely to commit suicide compared to black women[20, 21]. Mahdi et al. evaluated risk of suicide for women with gynecological malignancies and found that the women at greatest risk for suicide were white, unmarried, had advanced stage disease, higher grade disease, and absence of surgical treatment [9]. While women with gynecologic malignancies who committed suicide are more likely to be married than those with non-gynecologic malignancies, all women with gynecologic malignancies are more likely to be married than all women with non-gynecologic malignancies. This accounts for some of the difference, but this may also relate to issues with sexual function associated with gynecologic malignancies and treatment. It is possible that the finding that women with gynecological malignancies were more likely to be married may be explained in part by age differences, however, we are limited in our ability to examine this with the current resources. Future research should evaluate this finding further.

The current finding that women with gynecological malignancies are at higher risk of suicide compared to women diagnosed with non-gynecological malignancies is not surprising. Women with gynecological malignancies (including ovarian, uterine, cervical, vulvar, and vaginal cancers) have been found to have an increased risk of suicide compared

to women in the general population[8]. However, this has not been compared to women with other cancers. Similar to other cancer patients, women with gynecologic malignancies often experience feelings of depression, burdensomeness and social isolation. In addition, these women shoulder the additional burden of concerns regarding reduced sexual function [22, 23]. In fact, research indicates that up to 50% of women treated for gynecologic cancer may experience anatomical changes in the genitalia that impairs sexual function[24, 25] and can lead to changes in relationships with their sexual partners, anxiety, depression[26-28]. Further, research indicates that women with gynecologic cancer report poorer body image compared to women with breast cancer[29]. The combination of these emotional and psychological stressors may increase the risk for death by suicide among women with gynecologic cancers. Future research should explore the psychosocial factors associated with suicide among gynecologic patients in more depth and compare them to the psychosocial factors that predict suicide among women with non-gynecologic cancers.

Psychosocial distress is a serious quality of life issue for cancer patients and can progress to depression and suicide. Further, receiving a cancer diagnosis is often perceived as a stressful, life-threatening event that can trigger psychological trauma such as acute stress disorder (ASD) or posttraumatic stress disorder (PTSD)[30-32]. Poor psychological adjustment to a recent cancer diagnosis may in part explain increased risk of suicide during this time period. Future research should examine the relationship between ASD, PTSD, and suicide among recently diagnosed cancer patients.

The National Comprehensive Cancer Network (NCCN) has recently published guidelines regarding the screening and management of distress in cancer patients.[33] Psychosocial distress is a serious quality of life issue for cancer patients and can progress to depression and suicide. They recommend that all patients should be screened at their initial visit, at appropriate intervals, and as clinically indicated including with changes in disease status. The NCCN leaves the interpretation of “appropriate intervals” for screening to the discretion of the clinician. But our findings, along with the findings of other investigators, would suggest that intervals need to be decreased during the first 5 years of diagnosis, especially in the first year after diagnosis. The NCCN guidelines include risk factors and a screening tool for evaluating distress, but many brief screening instruments for evaluation of distress, depression, and suicide risk are available. For example, the Suicidal Ideation Screening Questionnaire is a 4-item measure that identifies medical patients at risk for suicide[34]. This measure has been validated in general medical settings and could be easily incorporated on patient intake forms. This relatively straightforward intervention could potentially permit timely identification of and intervention for patients who are at greater risk of suicide.

There are limitations to research utilizing registry data. Since this is observational data, conclusions regarding causality cannot be made. We are also limited by the availability of variables in the SEER database, meaning we are unable to assess many known risk factors for suicide using this database. Possible confounders, such as smoking status and history of sexual risk behaviors, are not available in this database. By using death certificate cause of death, there is a potential for misclassification bias. However, the large sample size is well suited to evaluation of an infrequent event such as suicide in a cancer population.

While suicide is an overall relatively infrequent cause of death among women with gynecological cancers, it is potentially preventable. The reasons for the elevated risk cannot be determined by the present study, however, it is possible that a better understanding of the descriptive epidemiology of suicide among gynecologic cancer patients may lead to improved risk assessment, targeted screening, and prevention of this avoidable cause of death. It is important to screen gynecologic cancer patients for psychological distress and risk of suicide. Given that the risk of suicide among gynecologic cancer patients is greatest

closer to the time of initial diagnosis, it is logical that health care providers offer gynecologic cancer patients access to available mental health support services at, or near, the time of initial diagnosis.

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LIST OF ABBREVIATIONS AND ACRONYMS

SEER-	Surveillance, Epidemiology and End Results
SMR-	standardized mortality ratio
US-	United States
RR-	relative risk
CI-	confidence intervals
NCCN-	National Comprehensive Cancer Network

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Figure 1. Time from diagnosis with gynecologic or non-gynecologic malignancy to suicide

The majority of women who committed suicide did so within 4 years of diagnosis. While the median time to death from suicide is sooner for women with non-gynecologic malignancies, the time at risk is greater for women with gynecologic malignancies.

Table 1

Demographic Data

	Gynecologic malignancy		Non-Gynecologic malignancy		
	Suicide (%)	No Suicide (%)	Suicide (%)	No Suicide (%)	OR (95%CI)
Patients	219	350,743	1,151	2,322,628	1.26 (1.09-1.46)
Race					
White	198 (90.41)	297,730 (84.89)	1,035 (89.92)	1,975,140 (85.04)	1.27 (1.09-1.47)
Black	5 (2.28)	28,184 (8.04)	32 (2.78)	196,411 (8.46)	1.09 (0.37-2.93)
American Indian/ Alaska Native	1 (0.46)	1853 (0.53)	7 (0.61)	10,126 (0.44)	0.78 (0.10-6.34)
Asian/Pacific Islander	15 (6.85)	20953 (5.97)	71 (6.17)	126,627 (5.45)	1.28 (0.70-2.29)
Other/Unknown	0 (0)	2023 (0.58)	6 (0.52)	14,324 (0.62)	0 (0-6.62)
Marital Status					
Single	22 (10.05)	50,577 (14.42)	145 (12.60)	270,877 (11.66)	0.81 (0.51-1.30)
Married	124 (56.62)	175,053 (49.91)	530 (46.05)	1,081,151 (46.55)	1.44 (1.18-1.76)
Divorced	25 (11.42)	30,650 (8.85)	153 (13.29)	201,069 (8.66)	1.07 (0.69-1.66)
Separated	5 (2.28)	5,917 (1.71)	15 (1.30)	35,961 (1.55)	2.03 (0.64-5.94)
Widowed	34 (15.53)	72,926 (21.06)	238 (20.68)	624,247 (26.88)	1.22 (0.84-1.77)
Unknown	9 (4.11)	14,122 (4.03)	70 (6.08)	109,323 (4.71)	1.00 (0.46-2.06)