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Increased prevalence of comorbid conditions in women with uterine cancer☆,☆☆

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HIGHLIGHTS

- Uterine cancer patients have significantly higher odds of multiple comorbidities.
- Increased odds of the most common comorbidities persisted after age adjustment.
- Survivorship programs should target components of the metabolic syndrome.

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ABSTRACT

Objectives. To compare comorbidities of women with uterine cancer (UC) to controls so as to aid in development of survivorship care plans and programs.

Methods. Retrospective cohort study using the University HealthSystem Consortium (UHC) database that compared women who had a hysterectomy for UC to women without UC undergoing hysterectomy. Frequencies and odds ratios (ORs) of 26 comorbidities were calculated. Mantel–Haenszel stratified ORs were determined to correct for different age distributions between the UC and control groups using UHC predetermined age groups.

Results. 23,227 patients in the dataset were included in the UC cohort, and 142,601 patients served as controls. Uncorrected ORs ≥ 2 were found for hypertension, diabetes, obesity, congestive heart failure, pulmonary circulatory diseases, peripheral vascular disease, and renal failure. Higher ORs for UC remained significant after stratification by age for hypertension (OR = 1.7), diabetes (OR = 2.1), obesity (OR = 3.3), congestive heart failure (OR = 1.5), pulmonary circulatory disorders (OR = 1.7), and renal failure (OR = 1.2).

Conclusions. Multiple comorbid conditions, specifically those related to the metabolic syndrome, were more prevalent in UC survivors than in the general population, and this difference persisted after adjustment for age. UC survivorship programs should plan to allocate resources to account for these differences in healthcare needs.

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1. Introduction

Uterine cancer is the 10th most common malignancy in the United States. Lifetime risk for uterine cancer is 2.8%, and there are estimated to be 54,870 new cases in 2015 [1,2]. Five-year survival is 88% survival in stage IA disease and 75% survival in stage IB disease [1]. As such, there are currently more than 600,000 survivors in the United States [1], and this number is expected to continue to increase.

As the uterine cancer survivor population continues to grow, survivorship care has become an area of increasing importance. Recent cohort studies suggest that comorbid conditions are prevalent in this group. Courneya et al. used a mailed survey of 386 uterine cancer survivors in Alberta, Canada to show that approximately 34% of these women were overweight, and another 38% were obese [3]. In a retrospective cohort study analyzing survival outcomes in 490 women with uterine cancer who had been treated at a single tertiary care institution with a total abdominal hysterectomy, Nicholas et al. found 47% of this population of uterine cancer survivors had a diagnosis of hypertension, and 26% had a diagnosis of diabetes [4]. Similarly, Nevadunsky et al. found a prevalence rate of 25% for diabetes among uterine cancer patients in a single institution retrospective cohort study of 985 women, and Ko et al. found 24% of 1495 endometrial cancer patients in their multi-institution cohort study had diabetes [5,6]. Notably, none of the above studies assessed for the known age-related increase in the prevalence of comorbidities in their epidemiologic assessment when compared to a reference group of women without uterine cancer.

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Comorbidities clearly impact survival in this cohort of women. The presence of several comorbidities has previously been shown to be associated with worse survival [4,7], and Ward et al. recently showed that women with uterine cancer are more likely to die of cardiovascular disease than uterine cancer [8]. Guidance for resource allocation to survivorship programs may help with their implementation. Describing and understanding the prevalence of common comorbidities will be a significant consideration. The objective of this study was to determine a comorbidity profile of women with uterine cancer at the time of hysterectomy in order to help effectively guide survivorship care and identify resource needs specific to this growing population.

2. Methods

This is a retrospective cohort study using the University HealthSystem Consortium (UHC) database to evaluate the odds of comorbid conditions of uterine cancer patients undergoing hysterectomy. UHC maintains an administrative database that includes patient information for 120 academic medical centers and 307 affiliated hospitals, and includes over 90% of US nonprofit academic medical centers.

Patients who had admissions between 2010 and 2014 who underwent a hysterectomy during that admission were included in this analysis. By using the admission in which hysterectomy was performed, no patients were included more than once. Male patients and patients under the age of 18 were excluded. Demographic information including age on admission, race, and presence of comorbid conditions was extracted for patients both with and without a diagnosis of uterine cancer. Odds of presence of each comorbid condition available in the database (Appendix A) was calculated and compared for patients with and without a diagnosis of uterine cancer.

In order to account for the expected increase in frequency of many comorbid conditions with increasing age, we performed an age-stratified analysis to focus on the association of comorbidities with uterine cancer. Statistical analyses were performed using Excel and Epi Info [9]. The Chi-squared test was used to evaluate for equality of distributions and the Mantel–Haenszel test was used to determine the confidence level for the stratified odds ratios. Statistical significance was defined as $p < 0.05$.

Table 1
Demographics of patients undergoing hysterectomy.[a]

	Uterine cancer	No uterine cancer	Significance (p-value)[b, c]
Age			$p < 10^{-5}$
Mean	62	48	
Median	62	47	
Race			$p < 10^{-5}$
White	71.7%	54.9%	
Black	14.1%	27.2%	
Asian	2.8%	3.3%	
Native American/Eskimo	0.6%	0.4%	
Hawaiian/Pacific Islander	0.3%	0.2%	
Other	8.3%	11.0%	
Unknown/ Declined	2.3%	3.0%	
Ethnicity[d]			$p < 10^{-5}$
Hispanic	5.3%	9.1%	
Non-Hispanic	36.8%	46.2%	
Hispanic origin unknown/not reported/unavailable/declined	57.9%	44.7%	
Insurance			$p < 10^{-5}$
Medicare	41.8%	15.5%	
Medicaid	8.8%	16.0%	
Commercial/ Private	39.2%	53.9%	
Other	10.2%	14.6%	

[a] Numbers have been rounded to the nearest 0.1%.
[b] Student t-test was used to determine statistical significance of the mean ages.
[c] Chi-square test was used to determine statistical significance of the race, ethnicity, and insurance distributions.
[d] If the Hispanic origin of a patient is unknown, not reported, unavailable, or declined it was coded into the database as such, and these designations have been combined within the above table.

Table 2
Prevalence rates of comorbid conditions in women with uterine cancer undergoing hysterectomy. See Table 4 in Appendix A for definition of comorbid conditions.

	Uterine cancer N = 23,227		No uterine cancer N = 140,601	
Comorbidities	Cases	Odds (%)	Cases	Odds (%)
Hypertension	13,690	58.94%	43,159	30.70%
Obesity	7980	34.36%	20,901	14.87%
Diabetes	6048	26.04%	13,412	9.54%
Hypothyroidism	3653	15.73%	13,411	9.54%
Chronic pulmonary disease	2890	12.44%	15,810	11.24%
Depression	2535	10.91%	13,456	9.57%
Deficiency anemias	2010	8.65%	18,512	13.17%
Renal failure	920	3.96%	2453	1.74%
Congestive heart failure	812	3.50%	1653	1.18%
Valvular disease	774	3.33%	2641	1.88%
Fluid and electrolyte disorders	723	3.11%	3328	2.37%
Other neurologic disorders	645	2.78%	3011	2.14%
Pulmonary circulation disorders	524	2.26%	1118	0.80%
Rheumatoid arthritis/ collagen vascular disease	509	2.19%	2616	1.86%
Psychoses	477	2.05%	3129	2.23%
Chronic blood loss anemia	445	1.92%	7333	5.22%
Liver disease	395	1.70%	1674	1.19%
Peripheral vascular disease	382	1.64%	902	0.64%
Weight loss	294	1.27%	1451	1.03%
Coagulopathy	240	1.03%	1872	1.33%
Alcohol abuse	142	0.61%	1127	0.80%
Paralysis	129	0.56%	516	0.37%
Drug abuse	115	0.50%	1806	1.28%
Lymphoma	72	0.31%	234	0.17%
AIDS	6	0.03%	226	0.16%
Peptic ulcer disease with bleeding	3	0.01%	12	0.01%

Table 3
Comorbid conditions in uterine cancer patients compared with non-uterine cancer patients undergoing hysterectomy, adjusted for age group on admission. Unadjusted and adjusted OR (95% CI).

Comorbidities	Crude OR (95% CI)	Adjusted OR (95% CI)
Significantly higher age adjusted odds among uterine cancer patients		
Obesity	2.99 (2.90–3.08)	3.26 (3.15–3.37)
Diabetes	3.33 (3.22–3.45)	2.14 (2.07–2.22)
Hypertension	3.24 (3.15–3.33)	1.70 (1.65–1.76)
Pulmonary circulation disorders	2.90 (2.61–3.21)	1.69 (1.52–1.89)
Congestive heart failure	3.05 (2.80–3.32)	1.48 (1.35–1.61)
Renal failure	2.32 (2.15–2.50)	1.18 (1.09–1.28)
Psychoses	0.95 (0.86–1.04)	1.17 (1.06–1.29)
Hypothyroid	1.77 (1.71–1.85)	1.12 (1.08–1.17)
Depression	1.16 (1.11–1.21)	1.11 (1.06–1.16)
Age adjusted odds are not demonstrably different between uterine cancer patients and controls		
Paralysis	1.52 (1.26–1.84)	1.20 (0.97–1.47)
Liver disease	1.44 (1.29–1.61)	1.12 (0.99–1.25)
Peripheral vascular disease	2.58 (2.29–2.91)	1.09 (0.96–1.24)
Other neurologic diseases	1.30 (1.19–1.42)	1.06 (0.97–1.16)
Chronic pulmonary disease	1.12 (1.07–1.17)	1.03 (0.99–1.08)
Valvular disease	1.81 (1.67–1.96)	0.98 (0.90–1.07)
Lymphoma	1.84 (1.42–2.38)	0.96 (0.74–1.26)
Bleeding peptic ulcer disease	1.06 (0.23–4.82)	0.51 (0.11–2.48)
Significantly lower age adjusted odds among uterine cancer patients		
Fluid and electrolyte disorders	1.32 (1.22–1.43)	0.90 (0.83–0.98)
Deficiency anemias	0.63 (0.60–0.66)	0.89 (0.84–0.93)
Rheumatoid arthritis/ collagen disease	1.18 (1.08–1.30)	0.87 (0.79–0.96)
Chronic blood loss anemia	0.36 (0.33–0.40)	0.80 (0.72–0.88)
Alcohol abuse	0.77 (0.65–0.91)	0.75 (0.63–0.90)
Coagulopathy	0.79 (0.69–0.90)	0.74 (0.65–0.86)
Drug abuse	0.38 (0.32–0.46)	0.67 (0.55–0.81)
Weight loss	1.23 (1.08–1.39)	0.65 (0.57–0.73)
AIDS	0.17 (0.07–0.37)	0.30 (0.14–0.65)