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Endometrial cancer survivors' perceptions of their cardiovascular disease risk (results from WF-1804CD AH-HA)

Joseph A. DeMari, MD[1,*], **Emily V. Dressler, PhD**[2], **Randi E. Foraker, MA, PhD**[3], **Brian J. Wells, MD, PhD**[4], **Sydney Smith, MSPH**[2], **Heidi Klepin, MD**[5], **William G. Hundley, MD**[6], **Glenn J. Lesser, MD**[5], **David I. Shalowitz, MD, MSHP**[1], **Chandylen L. Nightingale, PhD**[7], **Marcia Hernandez, DO**[8], **Kathryn E. Weaver, MPH, PhD**[7]

[1]Section on Gynecologic Oncology, Wake Forest University School of Medicine, Winston-Salem, NC.

[2]Department of Biostatistics and Data Science, Wake Forest University School of Medicine, Winston-Salem, NC.

[3]Department of Medicine, Washington University in St. Louis School of Medicine, St Louis, MO

[4]Department of Biostatistics and Data Science, Wake Forest University School of Medicine, Winston-Salem, NC.

[5]Section on Hematology-Oncology, Wake Forest University School of Medicine, Winston-Salem, NC, United States.

[6]Division of Cardiology, Pauley Heart Center, Virginia Commonwealth University, Richmond, VA.

[7]Department of Social Sciences and Health Policy, Wake Forest University School of Medicine, Winston-Salem, NC.

[8]Department of Women's Oncology, Mercy Hospital, Springfield, MO.

Abstract

[*]Corresponding author at: Gynecologic Oncology, 4th Floor Watlington Hall, Medical Center Blvd, Winston Salem, NC 27157, jdemari@wakehealth.edu.

Author Contribution

Joseph DeMari: Conceptualization, Writing – Original Draft, Writing – Review and Editing. **Emily V. Dressler:** Conceptualization, Methodology, Formal analysis, Writing – Review and Editing. **Randi E. Foraker:** Conceptualization, Methodology, Writing – Review and Editing, Project Administration, Funding acquisition, Supervision. **Brian J. Wells:** Writing – Review and Editing. **Sydney Smith:** Formal analysis, Writing – Review and Editing. **Heidi Klepin:** Writing – Review and Editing. **William G. Hundley:** Writing – Review and Editing. **Glenn J. Lesser:** Writing – Review and Editing. **David I. Shalowitz:** Writing – Review and Editing. **Chandylen L. Nightingale:** Writing – Review and Editing. **Marcia Hernandez:** Resources, Writing – Review and Editing. **Kathryn E. Weaver:** Conceptualization, Methodology, Writing – Review and Editing, Project Administration, Funding acquisition, Supervision.

Declaration of Competing Interest

None of the authors have any conflict of interest to disclose.

Supplementary data

Supplementary material

Objective: Despite considerable burden of cardiovascular disease (CVD), data on endometrial cancer survivors' CVD perceptions are lacking. We assessed survivors' perspectives on addressing CVD risk during oncology care.

Methods: This cross-sectional analysis utilized data from an ongoing trial of an EHR heart health tool (R01CA226078 & UG1CA189824) conducted through the NCI Community Oncology Research Program (NCORP, WF-1804CD). Endometrial cancer survivors post-potentially curative treatment were recruited from community practices and completed a pre-visit baseline survey, including American Heart Association Simple 7 CVD factors. Likert-type questions assessed confidence in understanding CVD risk, CVD risk perception, and desired discussion during oncology care. Medical record abstraction ascertained data on CVD and cancer characteristics.

Results: Survivors (N=55, median age = 62; 62% 0–2 years post-diagnosis) were predominately white, non-Hispanic (87%). Most agreed/strongly agreed heart disease poses a risk to their health (87%) and oncology providers should talk to patients about heart health (76%). Few survivors reported smoking (12%) but many had poor/intermediate values for blood pressure (95%), body mass index (93%), fasting glucose/A1c (60%), diet (60%), exercise (47%) and total cholesterol (53%). 16% had not seen a PCP in the last year; these survivors were more likely to report financial hardship (22% vs 0%; p=0.02). Most reported readiness to take steps to maintain or improve heart health (84%).

Conclusions: Discussions of CVD risk during routine oncology care are likely to be well received by endometrial cancer survivors. Strategies are needed to implement CVD risk assessment guidelines and to enhance communication and referrals with primary care.

Clinical Trials #: NCT03935282

Keywords

endometrial cancer; Cardiovascular disease; survivorship

INTRODUCTION

Endometrial cancer is the most common gynecologic malignancy in the United States; approximately 66,000 cases are estimated to have been diagnosed in 2022 [1]. For the two-thirds of patients diagnosed at an early stage, 5-year overall survival is approximately 95% [2]. Survivors of endometrial cancer are more likely to die of their comorbidities than their cancer, with cardiovascular disease (CVD) most common among comorbidities leading to death in this population [3–5]. This is likely due to the multiple overlapping risk factors for endometrial cancer and CVD including obesity and metabolic syndrome, elevating the importance of routinely addressing cardiovascular (CV) health as early as possible in survivorship care [3, 6, 7]. Treatment of endometrial cancer may add to this risk, after an initial period of weight loss following surgery the most common weight change pattern noted by Matuso et al. was a sustained BMI above the patient's baseline level [8].

Currently, the National Comprehensive Cancer Network (NCCN) recommends assessment of CVD risk in their survivorship guidelines [9]. Despite this, using survey data of over 1500 patients with breast, prostate, colorectal and gynecologic cancers, Weaver at al. found

that one in three survivors with at least one CV risk factor reported no discussion of health promotion with their oncologic provider [10]. This represents a significant gap between guidelines and clinical practice.

Though there are multiple publications looking at patients' perception of cancer recurrence risk, we were unable to find any published studies evaluating endometrial cancer patients' perceptions of their CV risk [11, 12]. Patients are ultimately responsible for the management of the majority of CV risks, including smoking behavior, diet, exercise and sleep. Without patient awareness of their CV risk and strategies to mitigate it, they are unlikely to participate in self-management or pursue CV health screening. In this paper, we assess endometrial cancer patients' perceptions of their CV risk, and whether there are specific factors that may influence CV risk perception in the context of endometrial cancer survivorship care.

METHODS

Setting

This study utilized a prospective cohort of 55 patients with endometrial cancer, from four practice groups enrolled in the Wake Forest NCI Community Oncology Research Program (NCORP) Research Base study (WF-1804CD, UG1CA189824) "Assessing Effectiveness and Implementation of an Electronic Health Record (EHR) Tool to Assess Heart Health Among Survivors". The NCI-funded Community Oncology Research Program (NCORP) is a national network that supports clinical trials and cancer care delivery research in community oncology clinics. The original protocol was approved by the NCI CIRB as well as recognized by the Wake Forest Health Sciences Institutional Review Board and has been described previously by Foraker et al. [13]. All participants provided informed consent prior to participation.

Eligibility criteria

Survivors were eligible if they were >6 months post-potentially curative treatment for endometrial cancer, currently without evidence of disease and able to provide verbal consent as well as complete a follow-up assessment in one year. They were excluded if they had a history of prior cancer recurrence (other than non-melanoma skin disease) or if they did not speak either English or Spanish.

Measures

Survivors completed a pre-visit baseline survivor survey as well as a post-appointment survey. The primary outcome of interest was patients' perceptions of their CV risk. Surveys included questions regarding perceived importance of heart health including questions assessing confidence in understanding risk of heart disease, such as "*I am confident I understand my risk of heart disease*", as well as understanding steps needed to improve heart health (e.g. "*I understand what steps I need to take to maintain or improve my heart health*" and perception that heart disease (or cancer) poses a risk to health (e.g. "*Heart disease poses a risk to my health*", "*Cancer poses a risk to my health*") previously described in Weaver et al. [10, 14].

Secondary objectives included patients' actual CV risk as assessed by their American Heart Association (AHA) Life's Simple 7 score, as well as exploring potential predictors of CV risk perception and patients' desire to talk to either an oncologist or a PCP about their heart health. The Life's Simple 7 score is calculated from seven metrics (smoking status, body mass index [BMI], physical activity, healthy diet score, total cholesterol, blood pressure and fasting plasma glucose/hemoglobin A1c), which are separated into ideal, intermediate, and poor values as defined in Lloyd-Jones et al, and shown in Supplemental Table 1 [15]. Two points are awarded for an ideal metric, one point for an intermediate metric, and zero points for a poor metric. The sum of these values is then divided by the total possible number of points (maximum of 14) to correct for any missing values. This gives a total Life's Simple 7 score out of a possible total score of 100, with "ideal" scores (high CV health) ranging from 73–100, "intermediate" scores (moderate CV health) from 50–72, and "poor" scores (low CV health) ranging from 0–49. There is an inverse relationship between ideal CV health and CVD incidence, with worsening scores being associated with an increased risk of CVD, including stroke, heart failure, peripheral artery disease, myocardial infarction (MI) and fatal coronary disease [16–20].

Patient perception questions were assessed on a 5-point Likert scale (strongly agree to strongly disagree). Survivors additionally reported on race and ethnicity, years of education, presence of financial hardship, and healthcare utilization (including visits to PCPs and other health care providers). Financial hardship was defined by answering yes to the question "*During the past 4 weeks, did you have enough money to meet the daily needs of your family?*". Additional demographic and clinical data, such as medical comorbidities, weight, height, smoking status, blood pressure, total cholesterol level, receipt of chemotherapy, fasting glucose, hemoglobin A1c level, and time since diagnosis were manually abstracted from the EHR. Patients with missing data are reflected in the included tables. Low risk endometrial disease (International Federation of Gynecology and Obstetrics (FIGO) stage I, low grade) was defined as known stage I without receipt of chemotherapy, or in the absence of staging information was defined as no receipt of chemotherapy. Patients with unknown staging information who did not meet criteria for low-risk disease were considered to have high-risk disease. Each patient's Life's Simple 7 score was calculated using EHR data at baseline and a self-reported health assessment from the above variables [13].

Statistical Analyses

Descriptive statistics were used to characterize baseline patient demographics and healthcare utilization. For the survivor survey, we grouped answers into 3 categories: strongly agree, agree, and a combination of neutral, disagree and strongly disagree. Associations with categorized perception of CV health and provider visit were evaluated with Fisher's Exact and Kruskal-Wallis tests as appropriate. A p-value less than 0.05 was considered statistically significant.

RESULTS

Description of population

A total of 55 endometrial cancer survivors were enrolled from four clinical sites, of which 48 (87%) were white, non-Hispanic (Table 1). The median age was 62 (IQR 53, 70) with a median BMI of 37 (IQR 30.3, 44.3). Two patients (3%) reported financial hardship. Thirty-four patients (62%) were within 6 months to 2 years from diagnosis, and 19 patients (34%) were within 3–5 years; 29 patients (53%) were considered to have low risk disease.

Cardiovascular Comorbidities and Risk Factors

Seven patients (12%) self-reported a history of CVD and two patients (3%) reported a history of MI or stroke (Table 1). The median number of CV comorbidities was 3 (IQR 1, 4); obesity (73%), hypertension (69%), hyperlipidemia (56%) and diabetes (42%) were the most prevalent. Additional comorbidities are listed in Supplemental Table 2.

Participants reporting either currently smoking (n=3) or quitting within the last 12 months (n=4) comprised 12% of the sample. Many participants had poor/intermediate Life's Simple 7 values for blood pressure (95%), BMI (93%), fasting glucose/A1c (60%), diet (60%), exercise (47%), and total cholesterol (53%) (Table 2). The average total Life's Simple 7 score based on these variables was 57.1 (IQR 50.0, 64.3). At study enrollment, nine patients (16%) reported not seeing a PCP in the last year, and only three (5%) had seen a cardiologist. All patients who had seen a cardiologist also reported seeing a PCP in the last year.

Perception of CV and cancer risk

When asked about confidence in understanding risk of heart disease, 81% of patients agreed or strongly agreed. Ninety percent of patients agreed or strongly agreed that they understood what steps they needed to maintain or improve their heart health and 83% agreed or strongly agreed that they planned to take steps to maintain or improve their heart health within the next year. The same proportion of patients who agreed or strongly agreed that heart disease poses a risk to their health (87%) also agreed or strongly agreed that cancer poses a risk to their health (87%); there was fair agreement between the risk ratings for heart disease and cancer (Kappa= 0.28, 95% CI 0.01–0.55). There were no patients who disagreed that cancer posed a risk to their health, but three patients (5%) disagreed that heart disease posed a risk to their health (Table 3).

Predictors of CV risk and perception

Patients with a self-reported history of CVD were more likely to strongly agree or agree that heart disease posed a risk to their health than have neutral feelings, disagree or strongly disagree (100% vs. 0%; p = 0.03). Those with intermediate Life's Simple 7 scores for diet were also more likely to strongly agree or agree than be neutral, disagree or strongly disagree that heart disease posed a risk to their health (97% vs. 3%; p=0.02). The remaining demographic and clinical factors did not yield any statistically significant associations with patients' perceptions of CV risk. Patients who had not seen a PCP in the previous 12 months were more likely to report financial hardship (n=2) than those who had seen a PCP (n=0)

(22% vs 0%; p=0.02). There were no patients who had seen a cardiologist that reported financial hardship.

Talking to oncologist about heart health

The majority of patients (76%) strongly agreed or agreed that oncology providers should talk to their patients about their heart health, with only 3% of patients disagreeing or strongly disagreeing. A similar proportion (72%) of patients strongly agreed or agreed that they thought it was important to talk to their oncology provider about heart health, with 3% of patients disagreeing or strongly disagreeing.

DISCUSSION

In this study, we calculated the Life's Simple 7 CV health score for endometrial cancer survivors recruited from four community oncology practice groups, using detailed surveys to elucidate both their understanding of this risk, as well as their opinions regarding both discussion of and mitigation of this risk. We found the majority of patients agreed that CVD posed a risk to their health, and that oncology providers should talk to their patients about their heart health. While we found that patients with a self-reported history of CVD and those with intermediate Life's Simple 7 scores for diet were associated with a greater perception that CVD posed a risk to their health, we did not find any associations between other CV risk factors or Life's Simple 7 metrics and patient perception of CVD risk. Comparable to previous studies looking at endometrial cancer survivors, our cohort had a high prevalence of comorbidities such as diabetes, hypertension and obesity [6, 7, 21, 22]. There were very few patients in the "ideal" category, potentially limiting our ability to detect a statistically significant difference in perception of risk based on the Life's Simple 7 metrics. The overwhelming majority of endometrial cancer survivors in our cohort have non-ideal CV health, suggesting the need for CV risk communication strategies to raise awareness of CV risk factors for both patients and their providers.

Though our study suggests that patients are motivated and willing to modify their behaviors to improve their CV health, the impact of a brief CV health assessment and discussion on gynecologic patients' CVD risk is not currently known. As data from the parent hybrid effectiveness-implementation study mature, we will be able to report on the effectiveness of an EHR based heart health assessment tool relative to usual care on patient CVH factors over one year.

Clinical practice guidelines recommend discussions of CV risk in oncology survivor care, and our study suggests that patients would welcome such discussions [9]. Similar to the previously mentioned study by Weaver et al., in a survey of 700 patients with a cancer diagnosis Nicolaije et al. found that 35% of patients responded that they were minimally informed on how to improve their health, with 42% responding that they were completely uninformed on how to improve their health [10, 23]. Unsurprisingly, Clark et al. found that PCPs were more likely than gynecologic oncologists to provide counseling regarding both diet and exercise [24].

While PCP's are able to provide excellent preventative care and management of CV comorbidities, Snyder et al. in breast and colon cancer survivors found that up to 20% had not seen a PCP within their first year of survivorship [25, 26]. As expected, these patients were less likely to get preventative care and have chronic and general health issues managed than those who saw a PCP in addition to an oncology provider. Similarly, in our cohort we found that 16% of endometrial cancer survivors had not seen a PCP or cardiologist within the last year. This is significant, as many gynecologic oncologists have neither the time, training, or resources to provide comprehensive CV care.

Multiple survivorship care models exist using different specialties of health care providers, all based on the coordination of care for cancer survivors to include cancer surveillance and prevention, counseling on long-term side effects of treatment, as well as general wellness and health maintenance [9, 27]. With numerous survivorship concerns important to patients, as well as specific concerns such as sexual health that are best addressed by a gynecologic provider [28], prioritizing and streamlining health promotion conversations during routine follow-up is critical. As the leading cause of death among endometrial cancer patients, CVD risk assessment should rank among the top priorities for a gynecologic oncologist, with a focus on referrals to primary care to appropriately manage risk. Timely referral and integration of PCPs in survivorship care is both acceptable to patients [29] and allows for better utilization of time-limited gynecologic oncology visits. Though our CV health assessment tool was tested among oncologists and advanced practice providers, it was designed to be brief and flexible enough to be used in several contexts of survivorship care; with the potential to be used in nursedirected or patient-directed approaches.

Our study's main strength is the combination of patient-reported CV data, including perceptions of both CV disease and cancer risk, with objective data from the EHR. Manual chart review provided details regarding patient comorbidities, medication use, lab values, and vital signs, thereby providing a robust view of each patient's CV risk factors. We acknowledge that while our EHR review was detailed, it is limited by the quality of the data recorded. We also acknowledge the small sample size of our cohort, as well as the lack of racial and ethnic diversity. This is largely a reflection of the populations served by the clinical sites participating in the parent trial; in our future implementation work, we will seek to enhance the participation of providers caring for diverse patient populations, especially considering the disproportionate burden of mortality among black women with endometrial cancer [30–32].

Endometrial cancer survivors have a considerable burden of CVD risk, with almost 1 in 6 patients not managed by a PCP or cardiologist. Our study is the first to show patients' desire to discuss this risk with their oncologist. As patients are ultimately the drivers for many of their behavioral risk factors, knowledge of this patient buy-in is crucial in facilitating improvement of survivors' CV health. Future studies designed at increasing the adoption of best practice guidelines regarding assessment of CVD risk in endometrial cancer patients are needed, as well as strategies to enhance communication and referrals between oncologists and PCPs.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Highlights

- Few endometrial cancer survivors have more than 3 ideal cardiovascular metrics as defined by the AHA's Simple 7
- Approximately 1 in 6 cancer survivors in our cohort had not seen a PCP or cardiologist within the past year
- The majority of survivors acknowledge their risk of cardiovascular disease and wish to discuss it with their oncologist

Table 1.

Sociodemographic and Clinical Characteristics of a Sample of Endometrial Cancer Survivors (n=55)

Demographic Variable	**Total N=55**
Age, median (IQR)	62 (53, 70)
BMI, median (IQR)	37.0 (30.3, 44.3)
Race and Ethnicity	
White, Hispanic	1 (1.8)
White, Non-Hispanic	48 (87.3)
Multiple races, Non-Hispanic	5 (9.1)
Other, Hispanic	1 (1.8)
Financial hardship[1]	
Yes	2 (3.6)
No	53 (96.4)
Education	
High School or less	15 (27.3)
Vocational or some college	16 (29.1)
College graduate or post-graduate	24 (43.6)
Self-reported history of CV disease[2]	7 (12.7)
History of MI or Stroke	2 (3.6)
Receipt of chemotherapy	24 (43.6)
Receipt of radiation	29 (52.7)
Time since diagnosis	
6 months – 2 Years	34 (61.8)
3–5 Years	19 (34.6)
5+ Years	2 (3.6)
Median (IQR)	2.29 (1.52, 3.64)

[1] Defined as inability to meet the daily needs of their family once in the past four weeks

[2] n=54

Table 2.

AHA Simple 7 Variables Among Endometrial Cancer Survivors

Simple 7 Variables[1]	Ideal (%)	Intermediate (%)	Poor(%)	Missing (%)
Smoking	48 (87.3)	4 (7.3)	3 (5.5)	0 (0.0)
Diet *	9 (16.4)	29 (52.7)	4 (7.3)	13 (23.6)
Physical activity *	29 (52.7)	24 (43.6)	2 (3.6)	0 (0.0)
Body Mass Index	4 (7.3)	7 (12.7)	44 (80.0)	0 (0.0)
Blood pressure	3 (5.5)	46 (83.6)	6 (10.9)	0 (0.0)
Total cholesterol	15 (27.3)	23 (41.8)	6 (10.9)	11 (20.0)
Fasting glucose/A1c	2 (3.6)	24 (43.6)	9 (16.4)	20 (36.4)

[1] As previously defined in methods section

* These values calculated from the self-reported health assessment

Table 3.

Endometrial Cancer Survivor Perceptions of Risk and Heart Health

	Strongly Agree or Agree		Neutral		Disagree or Strongly Disagree	
	N	%	N	%	N	%
I am confident I understand my risk of heart disease[1]	44	81.5	9	16.7	1	1.9
I understand what steps I need to take to maintain or improve my heart health	50	90.9	5	9.1	0	0.0
I plan to take steps to maintain or improve my heart health within the next year	46	83.6	8	14.6	1	1.8
Cancer poses a risk to my health	48	87.3	7	12.7	0	0.0
Heart disease poses a risk to my health	48	87.3	4	7.3	3	5.5
I think it is important to talk to my oncology provider about heart health[1]	39	72.2	13	24.1	2	3.7
Oncology providers should talk to their patients about their heart health	42	76.4	11	20.0	2	3.6

[1] n=54