Gynecologic Oncology xxx (2016) xxx–xxx

Contents lists available at ScienceDirect

Gynecologic Oncology

journal homepage: www.elsevier.com/locate/ygyno

Racial disparity in survival of patients with uterine serous carcinoma: Changes in clinical characteristics, patterns of care and outcomes over time from 1988 to 2011

Haider Mahdi [a,*], Xiaozhen Han [b], Fadi Abdul-Karim [c], Roberto Vargas [a]

[a] Gynecologic Oncology Division, Ob/Gyn and Women's Health Institute, Cleveland Clinic, Cleveland, OH, USA
[b] Population Health and Outcomes Research Core, Clinical and Translational Science Collaborative, Cleveland, OH, USA
[c] Department of Anatomic Pathology, Cleveland Clinic, Cleveland, OH, USA

HIGHLIGHTS

- African Americans were less likely to have cancer-directed surgery or extensive lymphadenectomy.
- Survival outcomes of both racial groups have improved over the three time periods.
- African American patients continued to have worse outcome compared to white patients.

ARTICLE INFO

Article history:
Received 30 November 2015
Received in revised form 29 February 2016
Accepted 1 March 2016
Available online xxxx

Keywords:
Uterine serous carcinoma
Outcome
Trends
SEER
Race
Disparity
African American

ABSTRACT

Objectives. To determine if the disparities in the outcome between white (W) and African American (AA) patients with uterine serous carcinoma (USC) have changed over time.

Methods. Women with USC were identified using the SEER database from 1988 to 2011 (N = 7667). Years of the study were divided into three periods (1988–1997, 1998–2004 and 2005–2011). Overall (OS) and disease-specific survivals (DSS) was estimated.

Results. Over the three time periods, African American patients continued to be younger and less likely to have cancer directed surgery and extensive lymphadenectomy when compared to white patients. In multivariable analysis adjusting for age, race, marital status, stage, cancer-directed surgery, extent of lymphadenectomy, adjuvant radiation, and geographic location, AA was significantly associated with worse DSS and OS in the three time periods compared to white race. African American patients were 29% (95% CI 1.03–1.62, $p = 0.027$) in 1988–1997, 40% in 1998–2004 (95% CI 1.21–1.63, $p < 0.0001$) and 34% in 2005–2011 (95% CI 1.13–1.59, $p = 0.0008$) more likely to die from uterine cancer compared to their white counterparts. A slight improvement in the difference in OS over time was noted comparing African American and white patients. African American patients were 46% (95% CI 1.23–1.73, $p < 0.0001$) in 1988–1997, 39% in 1998–2004 (95% CI 1.23–1.56, $p < 0.0001$) and 26% in 2005–2011 (95% CI 1.10–1.45, $p < 0.0001$) more likely to die from any cause compared to their white counterparts.

Conclusions. Significant improvement in outcome was noted in both racial groups over time. However, African American patients continued to have worse outcome than white patients over time.

1. Introduction

Endometrial cancer is the most common type of gynecologic malignancy in the United States, with 54,870 new diagnoses expected in 2015 [1]. Uterine serous carcinoma (USC) histology is a rare and aggressive histologic subtype of endometrial cancer that comprises 5–10% of new diagnoses [2–3]. While USC only represents a small proportion of endometrial cancer cases, it is associated with half of all mortalities and recurrences attributed to this malignancy. The poor prognosis associated with this histology is highlighted by a combined 5 year survival that is reported to be between 18 and 27%, likely secondary to most patients presenting with advanced disease [4].

Given the poor prognosis and aggressive behavior of USC, various modalities have been employed over the last two decades to attempt

* Corresponding author at: Ob/Gyn and Women's Health Institute, 9500 Euclid Ave, Cleveland, OH 44195, USA.
E-mail address: mahdih@ccf.org (H. Mahdi).

http://dx.doi.org/10.1016/j.ygyno.2016.03.002
0090-8258/

Table 1A
Association between race and demographic and clinical variables.

Variable		White N (column%)	Black N (column%)	Total N (column%)	p-Value
Age	Median (range)	70 (24, 97)	67 (35, 96)	69 (24, 97)	p < 0.0001
	Age < 65 years	1893 (30.7)	600 (40.3)	2493 (32.6)	
	Age ≥ 65 years	4274 (69.3)	890 (59.7)	5164 (67.4)	
Year of diagnosis	1988–1997	1075 (17.4)	184 (12.4)	1259 (16.4)	p < 0.0001
	1998–2004	2072 (33.6)	489 (32.8)	2561 (33.5)	
	2005–2011	3020 (49.0)	817 (54.8)	3837 (50.1)	
Stage	Stage I	2251 (40.3)	491 (37.1)	2742 (39.7)	p = 0.08
	Stage II	425 (7.6)	100 (7.6)	525 (7.6)	
	Stage III	875 (15.7)	196 (14.8)	1071 (15.5)	
	Stage IV	1671 (29.9)	438 (33.1)	2109 (30.5)	
	Unknown	364 (6.5)	99 (7.5)	463 (6.7)	
Stage	Early stage (I–II)	2676 (47.9)	591 (44.6)	3267 (47.3)	p = 0.08
	Late stage (III–IV)	2546 (45.6)	634 (47.9)	3180 (46.0)	
	Unknown stage	364 (6.5)	99 (7.5)	463 (6.7)	
Marital status	Married	3021 (49.0)	450 (30.2)	3471 (45.3)	p < 0.0001
	Non-married	2870 (46.5)	974 (65.4)	3844 (50.2)	
	Unknown	276 (4.5)	66 (4.4)	342 (4.5)	
Cancer-directed surgery	Yes	5681 (92.1)	1284 (86.2)	6965 (91.0)	p < 0.0001
	No	486 (7.9)	206 (13.8)	692 (9.0)	
Lymph node removed (examined)	Yes	3967 (64.3)	863 (57.9)	4830 (63.1)	p < 0.0001
	No	2158 (35.0)	609 (40.9)	2767 (36.1)	
	Unknown	42 (0.7)	18 (1.2)	60 (0.8)	
Extent of lymph node examined	0 node	2158 (35.0)	609 (40.9)	2767 (36.1)	p < 0.0001
	<10 nodes	1355 (22.0)	350 (23.5)	1705 (22.3)	
	≥10 nodes	2390 (38.8)	466 (31.3)	2856 (37.3)	
	Unknown extent	264 (4.2)	65 (4.4)	329 (4.3)	
Lymph nodes positive	Median (range)	3 (1, 97)	3 (1, 97)	3 (1, 97)	p = 0.002
	Yes	1301 (32.5)	321 (36.4)	1622 (33.2)	
	No	2667 (66.5)	542 (61.5)	3209 (65.6)	
	Unknown extent	41 (1.0)	18 (2.0)	59 (1.2)	
Radiation	Yes	2060 (33.6)	455 (30.7)	2515 (33.0)	p = 0.04
	No	3955 (64.4)	987 (66.6)	4942 (64.9)	
	Unknown	124 (2.0)	40 (2.7)	164 (2.2)	
Location	Central	1338 (21.7)	461 (30.9)	1799 (23.5)	p < 0.0001
	East	1650 (26.8)	575 (38.6)	2225 (29.0)	
	West	3179 (51.6)	454 (30.5)	3633 (47.5)	
Status	Alive	2629 (42.6)	570 (38.3)	3199 (41.8)	p = 0.003
	Dead from uterine cancer	2133 (34.6)	578 (38.8)	2711 (35.4)	
	Dead from other causes	1405 (22.8)	342 (23.0)	1747 (22.8)	
Total		6167	1490	7657	

to improve outcomes. Much like ovarian cancer, comprehensive surgical staging in early stage and aggressive cytoreduction in advanced stage were found to improve outcomes in USC [5–7]. Currently, adjuvant platinum-based chemotherapy ± radiation has become the standard treatment regimen in patients with USC [8–12].

Despite the advances in treatment modalities leading to improved outcomes, multiple studies performed in the last two decades have demonstrated a disparity in the prognosis of African American patients with endometrial cancer compared to their white counterpart [13–17]. As compared with the white population, African American patients are more likely to have higher-grade disease, deeper myometrial invasion, and more likely to have advanced stage disease [18]. When undergoing the same treatment in clinical trials, African Americans have worse survival outcomes [14]. In fact, while black women are less likely to develop endometrial cancer, they are almost twice as likely to die from their disease [19]. Differences in patient presentation, access to treatment, biologic variance, socioeconomic status, and variability in treatment approach have all been postulated to contribute to these finding [15,20].

Previous population based studies demonstrated that African American patients with advanced endometrial cancer of varied histology have worse outcomes compared to their white counterparts [17]. These studies were not specific to USC and did not stratify patients by time periods to account changes in treatment modalities over time in USC. Our study aims to employ the Surveillance, Epidemiology, and End Result database (SEER) to determine if the changes in treatment trends observed over the last two decades have translated to improved outcomes and reduced disparity in African American patients with USC, as compared to white patients.

2. Methods

Women with a diagnosis of USC were identified using SEER program from 1988 to 2011. Only women with serous histology (International Classification of Diseases, 3rd edition [ICD-3] codes 8460/3, 8461/3 and 8441/3) were included (8262 patients). Other inclusion criteria were known age, active follow up (4 patients were excluded), and known surgery and vital status (28 patients were excluded). Patients were grouped into two cohorts based on race: white and African American. Patients with other races were excluded (573 patients). Patients were categorized based on their geographic area of residence at the time of diagnosis as follows: central (Detroit, Michigan; Iowa; Kentucky; and Louisiana), eastern (Connecticut; New Jersey; Atlanta, Georgia; and rural Georgia), and western (Alaska; California; Hawaii; New Mexico, San Francisco, Los Angeles, and San Jose, California; Seattle, Washington; and Utah). Staging information was derived from the American Joint Cancer Committee (AJCC) staging information. When detailed information on extent of disease was not available, those cases were classified as unknown stage. Patients were

Please cite this article as: H. Mahdi, et al., Racial disparity in survival of patients with uterine serous carcinoma: Changes in clinical characteristics, patterns of care and ..., Gynecol Oncol (2016), http://dx.doi.org/10.1016/j.ygyno.2016.03.002