Gynecologic Oncology Reports 25 (2018) 102–105

Contents lists available at ScienceDirect

Gynecologic Oncology Reports

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

Case series

Definitive radiation therapy for cervical cancer: Non-white race and public insurance are risk factors for delayed completion, a pilot study

Shariska S. Petersen[a,*], Samfee Doe[a], Thomas Buekers[b]

[a] Department of Women's Health Services, Henry Ford Hospital, Detroit, MI 48202, USA
[b] Division of Gynecology Oncology, Department of Women's Health Services, Henry Ford Hospital, Detroit, MI 48202, USA

ARTICLE INFO

Keywords:
Cervical cancer
Disparities
Radiation therapy

ABSTRACT

This is a pilot study to assess whether racial disparities exist in time to initiation and completion of external beam pelvic radiation therapy and brachytherapy in cervical cancers treated with definitive chemoradiation.

A retrospective analysis was conducted on all cervical cancer patients treated with definitive radiotherapy between 2006 and 2016 at a single institution. Patient demographics including age, race, insurance status and stage at diagnosis were obtained. Analyses were performed according to the following definitions of wait times: interval from pathologic diagnosis of cervical cancer to (Siegel et al., 2016) initiation of radiation therapy, (Yoo et al., 2017) completion of external beam radiation therapy and (DeSantis et al., 2016) completion of external beam radiation therapy plus brachytherapy if indicated.

Of 50 women, 21 self-identified as white, 25 as black and 4 as Hispanic. Due to small numbers, Hispanic women were included with black women as a non-white group. The average age was 52 years for women in this cohort. Mean days to initiation of radiation therapy were 41.8 days: 33.7 days among white patients versus 47.8 days for non-white patients (p-value 0.101). Mean days from diagnosis to completion of external beam pelvic radiation therapy were 81.3 days: 70.9 days among white patients versus 88.9 days among non-white patients (p-value 0.006). Non-white patients were more likely to have public insurance, which was also associated with a longer time to completion of radiation treatment.

We conclude that non-white patients experienced delays to completing external beam radiation therapy, which was no longer present after adjusting for insurance status.

1. Introduction

Cervical cancer is the most common gynecologic malignancy worldwide. In the United States, about 12,000 women are diagnosed annually and over 4000 die (Siegel et al., 2016). Screening strategies have resulted in a decline in the incidence and mortality of cervical cancer but racial disparities still exist. Black women in particular are twice as likely to die from cervical cancer as white women and the disparity is even greater in the Southern United States (Yoo et al., 2017; DeSantis et al., 2016). In fact, mortality rates when corrected for hysterectomy reveal an even greater disparity between Black and white women (Rositch et al., 2014). Previously underestimated by at least 44%, hysterectomy corrected mortality rates are reported as 10.1 per 100,000 for black women and 4.7 for white women (Beavis et al., 2017).

Several factors including differences in health care access, screening, follow up and treatment have been proposed to contribute to the disparity (Singh and Jemal, 2017; Yang et al., 2018; McDougall et al., 2007). Specifically, studies investigating disparities in standard of care for locally advanced cervical cancer treatment found that black race was associated with a lower likelihood of receiving pelvic external beam radiation therapy (EBRT) with concurrent chemotherapy and brachytherapy(Uppal et al., 2016; Robin et al., 2016). Here we seek to determine if race is a factor in delayed initiation and completion of primary pelvic external beam radiation therapy (EBRT) and brachytherapy in cervical cancer.

2. Methods

Approval for the study was obtained from the Institutional Review Board at Henry Ford Hospital. A retrospective chart review was completed for all patients with a diagnosis of cervical cancer from 2006 to 2016 in a single institution. Patients who had hysterectomy as primary treatment, radiation therapy as an adjuvant or palliative therapy or in whom cervical cancer was not the primary malignancy were excluded. Only patients who underwent primary chemo-radiation therapy under

* Corresponding author at: Women's Health Services, Henry Ford Health System, 2799 West Grand Boulevard, Detroit, MI 48202, USA.
E-mail address: shariska.petersen@gmail.com (S.S. Petersen).

https://doi.org/10.1016/j.gore.2018.06.010
Received 21 March 2018; Received in revised form 11 June 2018; Accepted 17 June 2018
Available online 19 June 2018

Table 1
Patient characteristics.

		Overall (N = 50)	Non-White (N = 29)	White (N = 21)	Comparison p-value
Age (years)		52.0 ± 14.2	51.8 ± 15.1	52.4 ± 13.2	0.871 (T)
Stage	IB	1	1	0	0.613 (CA)
	IB1	2	1	1	
	IB2	9	5	4	
	IIA	5	2	3	
	IIB	25	17	8	
	IIIA	1	0	1	
	IIIB	5	3	2	
	IVB	2	0	2	
Received Chemotherapy	No	6	5	1	0.380 (F)
	Yes	44	24	20	
Received Brachytherapy	No	15	9	6	0.552 (T)
	Yes	35	20	15	
Smoking Status	Never	14	8	6	0.040 (C)*
	Current	27	19	8	
	Former	9	2	7	
Insurance Status	None	3	2	1	0.020 (F)*
	Private	14	4	10	
	Public	33	23	10	
Side Effects	No	24	12	12	0.271 (C)
	Yes	26	17	9	
Tumor Board prior to Treatment	No	23	12	11	0.441 (C)
	Yes	27	17	10	
PET CT Prior to Treatment	No	4	4	0	0.129 (F)
	Yes	46	25	21	
Reason for Delay	None	33	13	20	< 0.001 (F)*
	Insurance	3	3	0	
	Compliance	14	13	1	

Numerical data is given as mean ± standard deviation and categorical data is given as frequency.
(W) = Wilcoxon Rank Sum Test, (T) = *t*-Test, (CA) = Cochran-Armitage Trend Test, (F) = Fisher Exact Test, (C) = Chi-Square Test.
* Statistically Significant, $p < .05$.

Table 2
Time to initiation, duration and completion of external beam radiation therapy and brachytherapy.

	Overall (N = 50)	Non-White (N = 29)	White (N = 21)	Comparison p-value
Days to Initiate Radiation Therapy	41.8 ± 28.7	47.6 ± 30.8	33.7 ± 23.8	0.101 (W)
External Beam Treatment Duration	39.7 ± 7.9	41.3 ± 9.3	37.5 ± 4.8	0.114 (W)
Days to External Beam Completion	81.3 ± 29.0	88.9 ± 30.4	70.9 ± 23.9	0.006 (W)*
Days to EBRT plus Brachytherapy Completion	95.0 ± 24.1	101.5 ± 28.5	86.4 ± 13.1	0.161 (W)
Duration of EBRT plus Brachytherapy	56.7 ± 7.5	56.2 ± 6.2	57.3 ± 9.1	0.683 (T)

All data is summarized as mean ± standard deviation.
(W) = Wilcoxon Rank Sum Test, (T) = Two-Sample *t*-Test.
* Statistically Significant, $p < .05$.

Table 3
Time to completion and duration of therapy based on insurance status.

	Insurance Type		Comparison P-value
	Private (N = 14)	Public (N = 33)	
Days to External Beam Completion	66.8 ± 13.8	88.5 ± 32.3	0.019 (W)*
Duration of EBRT plus Brachytherapy	58.8 ± 8.3	55.1 ± 7.1	0.188 (T)

All data is summarized as mean ± standard deviation.
(W) = Wilcoxon Rank Sum Test, (T) = Two-Sample *t*-Test.
* Statistically Significant, $p < .05$.

the care of a gynecologic oncologist were included. Stage at diagnosis, age, insurance status, smoking status, date of pathological diagnosis, date of initiation and date of completion of external beam radiation therapy were abstracted from chart review. Receipt of chemotherapy and/or brachytherapy, duration of brachytherapy and reported chemotherapy and radiation side effects were also abstracted from chart review. Presentation at multidisciplinary tumor board and PET CT imaging prior to treatment were also noted.

Analyses were performed according to the following distinct definitions of wait times: interval from pathologic diagnosis of cervical cancer to (Siegel et al., 2016) initiation of radiation therapy, (Yoo et al., 2017) completion of external beam radiation therapy and (DeSantis et al., 2016) completion of external beam radiation therapy plus brachytherapy. Treatment duration was also calculated as the time from initiation of external beam radiation therapy to completion of brachytherapy. To characterize reasons for delay, patients who had > 3 documented missed appointments or > 3 failed attempts at contact were categorized as delayed due non-compliance and patients who had documented issues with insurance coverage we categorized as delayed due to insurance. Analyses of times to completion were made using 2-sample *t*-tests if the means were normally distributed, if not the Wilcoxon rank sum test was used. Comparisons involving the categorical variables were made using chi-square tests in the absence of sparse data; otherwise, the Fisher exact test was used.

3. Results

A total of 50 women underwent primary external beam pelvic radiation therapy for cervical cancer at our institution over a 10-year