Sociodemographic factors associated with stage of diagnosis and treatment uptake among patients with colorectal cancer: A brief report

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A B S T R A C T

Introduction: Previous research has indicated the presence of sociodemographic differences in disease stage at diagnosis and treatment uptake among patients with colorectal cancer (CRC). Patients that identify as black, being female and older age are associated with a decreased uptake of therapeutic options, however these findings are inconsistent in the literature. The purpose of this analysis was to examine the presence of sociodemographic disparities in disease stage and diagnosis and subsequent treatment uptake among patients with CRC.

Materials & methods: This secondary data analysis was conducted utilizing a tumor registry database from a academic cancer center with data from patients with diagnosed adenocarcinoma of the colon, rectum or rectosigmoid junction ($n = 524$) from May 2009 to May 2014. Diagnosed disease stage and treatment uptake differences were assessed among sociodemographic groups.

Results: Analyses showed that being female and decreased age were significantly associated with more advanced diagnosed disease stage. There were no significant sociodemographic predictors associated with patients who received treatment versus those who did not. Additionally, there were no significant differences by sociodemographic factors for treatment type.

Conclusions: Sociodemographic disparities were present among women and younger patients related to disease stage at diagnosis. Future research is needed to corroborate the presence of and psychosocial mechanisms behind disparities in diagnosis and treatment uptake among patients with CRC.

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1. Introduction

Colorectal cancer (CRC) is the third most commonly diagnosed cancer type and third leading cause of cancer death [1]. Within the last decade research has shown that there are racial, age, gender and socioeconomic disparities in cancer diagnosis, treatment and care. In 2015, CRC diagnosis accounted for 10% and 11% of all diagnosed cancer cases among black women and men, respectively. Along with being diagnosed at higher rates (65.1 compared to 52.8, rate ratio = 1.23), black men are also at a significantly higher risk of death compared to white men (rate ratio = 1.53) (all rates are per 100,000) [1,2]. Importantly, the gap in mortality rates for black and whites has not only lingered, but it has increased since the 1970s

[1,2]. According to the American Cancer Society (ACS), in 2007 CRC mortality rates were 44% higher among black compared to whites. Additionally, black were significantly less likely to receive a diagnosis of localized disease, more likely to receive a diagnosis of distant disease and more likely to be diagnosed and die at younger ages [1,3,4]. One study found that black patients had higher mortality rates from CRC after controlling for sex, age, tumor stage and grade [5].

Regarding treatment, blacks and whites are equally likely to have a consultation with a medical oncologist, but blacks are significantly less likely to receive further treatment. Despite a significant improvement in survival from the use of adjuvant therapy in CRC, approximately 33.5% of black patients refused adjuvant chemotherapy compared to 21% of whites. This disparity was largest among blacks between the ages of 66–70 [4]. Disparities in the uptake of adjuvant chemotherapy have been shown among older patients [6], women [7,8], blacks and patients who are unmarried [9]. Additionally, patients with lower incomes and patients who are insured

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Table 1
Sociodemographics, treatment status, and cancer site for the total sample and by disease stage.

	Total sample (n = 524)	Disease stage					p-Value
		0 (n = 22)	1 (n = 114)	2 (n = 103)	3 (n = 135)	4 (n = 127)	
Mean age (SD)[†]	62.2 (13.3)	63.6 (13.0)	64.3 (12.5)	64.2 (11.8)	59.7 (13.1)	59.8 (13.1)	**0.0049**
Sex							0.1227
Male	252 (48.1%)	14 (63.6%)	61 (53.5%)	54 (52.4%)	74 (54.8%)	59 (46.5%)	
Female	272 (51.9%)	8 (36.6%)	53 (46.5%)	49 (47.6%)	61 (45.2%)	68 (53.5%)	
Race[*]							0.1388
White	422 (81.5%)	20 (90.9%)	97 (86.6%)	88 (86.3%)	105 (78.4%)	98 (77.2%)	
Black	96 (18.5%)	2 (9.1%)	15 (13.4%)	14 (13.7%)	29 (21.6%)	29 (22.8%)	
Marital status[*]							0.0841
Single	137 (26.8%)	5 (23.8%)	25 (22.5%)	19 (18.8%)	45 (33.8%)	35 (28.2%)	
Married	264 (51.6%)	14 (66.7%)	57 (51.4%)	61 (60.4%)	66 (49.6%)	57 (45.9%)	
Divorced/widowed/separated	110 (21.5%)	2 (49.5%)	29 (26.1%)	21 (20.8%)	22 (16.5%)	32 (25.8%)	
Insurance status[*]							0.9027
Uninsured	48 (9.2%)	2 (9.1%)	8 (7.0%)	10 (9.8%)	16 (11.6%)	9 (7.1%)	
Public insurance	310 (59.5%)	14 (63.6%)	68 (59.6%)	63 (61.7%)	77 (57.0%)	74 (58.3%)	
Private insurance	163 (31.3%)	6 (27.3%)	38 (33.3%)	29 (28.4%)	42 (31.1%)	44 (34.6%)	
Treatment received[*]							**<0.0001**
No		3 (13.6%)	6 (5.2%)	6 (5.8%)	2 (1.5%)	23 (18.1%)	
Yes		19 (86.3%)	108 (94.7%)	97 (94.2%)	133 (98.5%)	104 (81.9%)	
Cancer site[*]							**<0.0001**
Colon	315 (60.1%)	13 (59.1%)	61 (53.5%)	58 (56.3%)	78 (57.8%)	92 (72.4%)	
Rectum	163 (31.1%)	6 (27.3%)	45 (39.5%)	36 (34.9%)	44 (32.6%)	24 (18.9%)	
Rectosigmoid junction	46 (8.9%)	3 (13.6%)	8 (7.0%)	9 (8.7%)	13 (9.6%)	11 (8.6%)	

Values shown in bold are significant findings.
[*] Fisher's exact test used.
[†] Two-sided *t*-test used.

through Medicaid are less likely to receive adjuvant therapies [9]. Bradley et al. found that patients with Medicaid coverage were less likely to initiate and complete adjuvant therapy, and also less likely to be evaluated by a medical oncologist [10]. However, previous research also found that race was not associated with adjuvant therapy uptake among patients with CRC after controlling for sex, age and insurance status [5]. The purpose of this analysis was to add to the existing body of literature and examine the presence of sociodemographic disparities in disease stage at diagnosis and subsequent treatment uptake among patients with CRC.

2. Methods

2.1. Sample

Secondary data analysis was conducted utilizing a tumor registry database at the University of Florida Health Care System. Analysis included all patients, 18 years and older, diagnosed with adenocarcinoma of the colon, rectum or rectosigmoid junction between May 1, 2009 and May 1, 2014. Data used in this analysis is publically available, pre de-identified data therefore IRB approval was not required.

2.2. Measures

Patient pathologic staging was categorized as stage 0–4. Treatment uptake was categorized as patients who received treatment versus patients who did not. Treatment type was categorized as surgery only, surgery and adjuvant therapy, no treatment, and other treatment. Demographic variables assessed included, sex, age, race/ethnicity, gender, marital status, and insurance type. Race was dichotomized to white and black due to the low prevalence of other races in the sample population. Insurance type was characterized into three groups: (1) no insurance/self-pay, (2) public

insurance (i.e. medicare/medicaid/veterans affairs) and (3) private insurance.

2.3. Analysis

Differences in age, sex, race, marital status, and cancer location were examined across treatment groups (treatment received versus no treatment received), and across disease stage (0–4) using chi-square tests (Fisher's Exact used where appropriate). ANOVA and two-sided *t*-tests were used to compare mean ages across groups. Finally, a multiple linear regression model was used to identify independent factors associated with disease stage at diagnosis, and a logistic regression model was used to identify independent factors associated with treatment type. The data analysis for this paper was generated using SAS software (SAS Institute Inc., Cary, NC, USA).

3. Results

3.1. Patient characteristics

Table 1 gives the sociodemographic characteristics of the overall patient sample (n = 524) along with the overall prevalence of each disease stage and treatment uptake. The mean age of patients was 62.2 (SD = 13.3). The majority of patients were white/Caucasian (81.5%) and married (51.6%). Over half had public insurance (59.3%), while 9.2% of patients were uninsured. Most patients had a colon cancer diagnosis (60.1%) with a fairly equal distribution of patients by disease stage 1–4.

3.2. Differences in stage at diagnosis

Table 1 also shows the sociodemographic factors associated with disease stage at diagnosis. Overall, average patient age sig-