



Patterns-of-care disparities among uninsured versus insured patients with anorectal carcinoma referred for radiotherapy at an Urban Safety-Net Hospital

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Background: To compare patterns-of-care and clinical outcomes among uninsured versus insured patients (IPs) with anorectal malignancies referred for radiotherapy at an urban safety-net hospital. This topic is important because uninsured patients (UPs) in the US often have limited access to health care, which can result in worse health outcomes.

Methods: We reviewed the medical records of 59 patients with biopsy-proven, non-metastatic anal and rectal cancers who received curative-intent primary or neoadjuvant/adjuvant radiotherapy between May 2002 and August 2012. Data regarding patient and disease characteristics, weight loss, insurance status at symptom onset, date of first therapeutic intervention, and survival status at last follow-up, were collected and analyzed.

Results: The percentage of IPs presenting with T4 tumors was 7% versus 40% among the uninsured (P=0.005). The median interval between first symptom onset and diagnosis date was 89 (range, 0–1,428) days for IPs and 221 (range, 0–1,576) days for UPs (P=0.01). The median interval between first symptom onset and treatment initiation was 172 (range, 9–1,498) days for IPs and 302 (range, 35–1,624) days for UPs (P=0.01). The 5-year overall survival rate was 59% for the entire cohort, 62% for the insured patients, and 55% for the uninsured patients (P=0.76)

Conclusions: Differences in health insurance status demonstrated various disparities in patterns-of-care, including significant delay in diagnosis, more advanced-stage disease at presentation, and treatment initiation delays among UPs. Nevertheless, overall survival at 5 years was not statistically significant between the insured and the uninsured.

Keywords: Health disparities; insurance coverage; gastrointestinal cancer; radiation oncology

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Introduction

Health insurance status has been implicated in disparities in cancer care and treatment outcomes in a multitude of healthcare settings. Specifically, it has been shown that patients were treated differently resulting in increased rates of mortality in uninsured and Medicaid insured patients (IPs) with colorectal cancer when compared to their commercial fee-for-service counterparts (1). This study is limited in our context as approaches to colorectal and anorectal carcinoma are different and the age of the study. This topic is clinically important because uninsured patients (UPs) in the US often have limited access to health care, which can result in worse health outcomes.

Approximately 2.7 million Florida residents (13% of the state's population) are without health insurance, including 13.8% of Jacksonville, Florida, residents under the age of 65 years (2,3). Safety net hospitals, which are defined as hospitals that organize and deliver meaningful health care to patients with no insurance or those on Medicaid, serve an important need for these patients (4). Our institution, the University of Florida (UF) Health System is one of ten safety net hospital systems in the state of Florida (5).

The purpose of this study was to define the disparities in cancer care and treatment outcomes among patients receiving care at UF Health in Jacksonville. For several reasons, in this study, we focused on anal and rectal malignancies. Primarily, the most common presenting symptoms of anorectal cancers are changes in bowel habits, abdominal pain, and rectal bleeding. These symptoms typically do not constitute medical emergencies and, as such, an emergency department visit for rectal bleeding (without significant anemia, hemodynamic instability, or fever) is likely to result in referral to a specialist, and not a hospital admission. A referral of an UP to a specialist is unlikely to result in timely care and, thus, can exacerbate disparities in health care owing to insurance status. We sought to compare the patterns-of-care and clinical outcomes of UPs versus IPs with anorectal malignancies referred for radiotherapy (RT) at one of our urban safety-net hospitals, UF Health in Jacksonville, Florida. Our hypothesis was that patients without insurance would experience delays in establishing a diagnosis, thus resulting in more advanced malignancies and worse survival. We present the following article in accordance with the TREND reporting checklist (available at <https://jgo.amegroups.com/article/view/10.21037/jgo-21-592/rc>).

Methods

Participants

The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). The study was approved by the Institutional Review Board of the University of Florida (IRB201801009) and the informed consent was taken from all individual participants. We retrospectively reviewed the medical records of 59 patients with biopsy-proven, non-metastatic anal and rectal cancers who received curative-intent treatment with primary or neoadjuvant/adjuvant radiation therapy at UF Health in Jacksonville between May 2002 and August 2012.

Assessment

Data regarding patient demographics, disease stage at diagnosis, weight loss at diagnosis, date of first symptom onset, date of tissue diagnosis, insurance status at time of symptom emergence, date of first therapeutic intervention (i.e., surgery, chemotherapy, or radiotherapy), and survival status at last follow-up were extracted. We analyzed the differences in patterns of care, defined as significant delays in diagnosis, more advanced-stage disease at presentation, and treatment initiation delays between the two groups. There was a total of 29 insured and 30 uninsured included in the study.

Procedures

In general, treatment for anal cancer consisted of definitive radiation therapy with concurrent chemotherapy; for rectal cancer, treatment included neoadjuvant radiation therapy with concurrent chemotherapy, followed by surgery, and adjuvant chemotherapy. We excluded patients who did not receive curative-intent treatment, those with metastatic disease, and those with documented severe mental health illness that inhibited their ability to provide reliable follow-up.

Statistical analysis

SAS and JMP software were utilized for statistical analysis (SAS Institute, Cary, NC, USA). The Kaplan-Meier product limit method provided estimates of overall survival. The log-rank test statistic assessed the level of statistical significance between strata of selected prognostic factors. Given the relatively small sample size for this series, we

Table 1 Patient, tumor, and insurance details (N=59)

Characteristic	Number of patients (%)
Age, median (range)	57 [30–89] years
Sex	
Male	33 (55%)
Female	26 (44%)
Race	
White	37 (63%)
Non-White	22 (37%)
Primary site	
Anus	18 (31%)
Rectum	41 (69%)
Tumor stage	
T1	2 (3%)
T2	10 (17%)
T3	33 (56%)
T4	14 (24%)
Nodal stage	
N0	24 (41%)
N1	35 (59%)
Insurance status at the time of symptom emergence	
Uninsured (primary)	30 (51%)
Insured (primary)	29 (49%)

did not perform any type of multiple regression with insurance status in the simultaneous presence of other selected prognostic factors. A P value <0.05 was considered statistically significant.

Results

We analyzed 59 patients with a median age of 57 (range, 29–89) years. Patient, tumor, and insurance details are shown in *Table 1*. At the time of symptom emergence, 29 patients were insured, including 17 male and 12 female patients, while 30 were uninsured, including 16 male and 14 female patients (P=0.79). Tumor and nodal stages distributed by insurance status are displayed in *Table 2*, while disease course characteristics stratified by insurance status are displayed in *Table 3*.

The median follow-up for all patients was 5.4 years

(range, 0–13.8 years), and for living patients it was 8.3 years (range, 1–13.8 years). The median follow-up for IPs was 5.7 years (range, 0–13.8 years) and 5.2 years (range, 0.7–12.8 years) for UPs (P=0.55). The 5-year overall survival rate was 59% for the entire cohort, 62% for IPs, and 55% for UPs (P=0.76) (*Figure 1*). The rates of overall survival were not statistically different based on sex (P=0.27), insurance status (P=0.76), race (P=0.78), or the length of time that elapsed between diagnosis of the anal or rectal cancer (below or above median) (P=0.28).

Discussion

Health insurance availability has been a growing issue for decades due to the increasing cost of health care and a myriad of other factors that are often out of the patient and health provider's control. In the state of Florida, nearly 2.7 million people (13% of the state's population) are without coverage (2). For the uninsured, paying fully out of pocket for treatment is prohibitively expensive and, as a result, those without insurance coverage face many barriers to receiving care, and lack of insurance has been shown in other studies to correlate with the diagnosis of more advanced disease (6,7).

In this study, we retrospectively reviewed all patients who received radiation treatment as a part of curative-intent cancer care for rectal adenocarcinoma and squamous cell carcinoma of the anus at our safety-net hospital. Our aim was to identify differences in disease severity, time to diagnosis, time to treatment start, and survival based on the insurance status of our patients. Unsurprisingly, our results demonstrated that patients with insurance were more likely to have a shorter time from symptom onset to diagnosis, and symptom onset to radiation treatment initiation, than patients without insurance. It stands to reason that patients with better access to health care will receive the proper medical care earlier than patients with poorer access to health care. These delays may explain why there was a significantly greater proportion of UPs as compared to IPs who presented with advanced T4 tumors among our cohort (40% vs. 7%, P=0.005). Similar associations between insurance status and disease severity have been reported among patients with glioblastoma multiforme and those with germ cell tumors (8,9). As our findings demonstrate, once patients were diagnosed with a malignancy, there were no significant differences in time from diagnosis to time to treatment as a function of insurance status (P=0.27).

Contrary to our hypothesis, these differences in timely

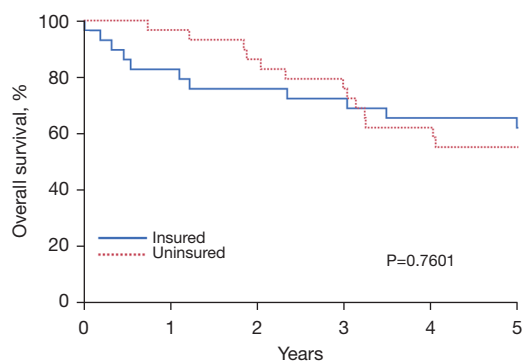
Table 2 Tumor and nodal category stratified by insurance status (N=59)

Insurance status	Tumor stage		Nodal stage	
	T1–T3	T4	N+	N0
Insured (n=29)	27 pts (93.1%)	2 pts (6.9%)	14 pts (48.27%)	15 pts (51.72%)
Uninsured (n=30)	18 pts (60%)	12 pts (40%)	21 pts (70%)	9 pts (30%)
Total	45 pts	14 pts	35 pts	24 pts

pts, patients.

Table 3 Disease course characteristics stratified by insurance status

Characteristic	Insured patients (n=29)	Uninsured patients (n=30)	P value
Age, median (range)	63 (33–89) years	52 (30–64) years	–
Interval between first symptom onset and date of tissue diagnosis, median (range)	89 (0–1,428) days	221 (0–1,576) days	0.0063
Interval between first symptom onset and treatment irradiation, median (range)	172 (9–1,498) days	302 (35–1,624) days	0.0095
Weight loss at diagnosis, median (range)	0 (0–44) pounds	13 (0–100) pounds	0.0051
T4 tumors at the time of diagnosis, number of patients (%)	2 (7%)	12 (40%)	0.0048
Nodal metastasis (N+) at the time of diagnosis, number of patients (%)	14 (29%)	21 (70%)	0.1154
Interval between tissue confirmation of malignancy and initiation of therapy, median (range)	61 (7–172) days	48 (9–1,118) days	0.2749

**Figure 1** Kaplan-Meier curves for overall survival at 5 years stratified by insurance coverage.

access to care did not lead to meaningful differences in overall survival. While we suspected that these factors would result in poorer survival, we were not able to establish a relationship between insurance status and survival (or gender or race). The absence of a statistically significant survival decrement for the uninsured patients is most likely

attributable to the fact that our study design excluded patients who developed metastatic disease prior to referral for radiation treatment. It may be that those with the least access to care and greater treatment delays developed metastatic disease before treatment and, thus, this segment of the uninsured population was never captured in our data. With inclusion of these patients, a relationship between treatment delays and survival outcomes might have become more apparent.

Despite this shortcoming, we believe that our findings are valuable as they highlight differences in disease characteristics and care based on insurance status. The Congressional Budget Office (CBO) estimates that in the United States in 2019, 12% (30 million) people under the age of 65 years old, were uninsured (10). Furthermore, the CBO anticipates that due to the COVID-19 pandemic and resulting economic downturn, the number of uninsured people increased in 2020. Proposing health policy changes is beyond our area of expertise and the scope of this paper, but it is a foregone conclusion that expansion of health care coverage is needed.

Conclusions

In conclusion, UPs with anal and rectal malignancies without insurance experienced longer time intervals between symptom onset, tissue diagnosis, and treatment initiation, and had more advanced disease than IPs treated at our safety-net hospital. Despite these key findings, we were not able to demonstrate that differences in insurance status correlated with overall survival. UPs face many challenges when attempting to secure timely care. More measurable action to improve access to health care is needed.

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Footnote

Reporting Checklist: The authors have completed the TREND reporting checklist. Available at <https://jgo.amegroups.com/article/view/10.21037/jgo-21-592/rc>

Data Sharing Statement: Available at <https://jgo.amegroups.com/article/view/10.21037/jgo-21-592/dss>

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <https://jgo.amegroups.com/article/view/10.21037/jgo-21-592/coif>). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). The study was approved by the Institutional Review Board of the University of Florida (IRB201801009) and the informed consent was taken from all individual participants.

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