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Brief Communication

BRIEF COMMUNICATION

Colorectal Cancer Care Among Young Adult Patients After the Dependent Coverage Expansion Under the Affordable Care Act

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Abstract

The effect of the Dependent Coverage Expansion (DCE) under the Affordable Care Act (ACA) on receipt of colorectal cancer treatment has yet to be determined. We identified newly diagnosed DCE–eligible (aged 19–25 years, n = 1924) and DCE–ineligible (aged 27–34 years, n = 8313) colorectal cancer patients from the National Cancer Database from 2007 to 2013. All statistical tests were two-sided. Post-ACA, there was a statistically significant increase in early-stage diagnosis among DCE–eligible (15 percentage point increase, confidence interval = 9.8, 20.2; $P < .001$), but not DCE–ineligible ($P = .09$), patients. DCE–eligible patients resected for IIB–IIIC colorectal cancer were more likely to receive timely adjuvant chemotherapy (hazard ratio = 1.34, 95% confidence interval = 1.05 to 1.71; 7.0 days' decrease in restricted mean time from surgery to chemotherapy, $P = .01$), with no differences in DCE–ineligible patients (hazard ratio = 1.10, 95% confidence interval = 0.98 to 1.24; 2.1 days' decrease, $P = .41$) post-ACA. Our findings highlight the role of the ACA in improving access to potentially lifesaving cancer care, including a shift to early-stage diagnosis and more timely receipt of adjuvant chemotherapy.

Colorectal cancer is a leading cause of cancer death in the United States, and the incidence and mortality rates among young adults are rising (1,2). Health insurance coverage is a strong predictor of quality cancer care (3), and lack of coverage is associated with late-stage diagnosis and receipt of suboptimal care (3,4).

Consensus guidelines disseminated by the National Comprehensive Cancer Network and the American Society of Clinical Oncology recommend the use of adjuvant chemotherapy for all stage IIB–IIIC colon cancer patients (5,6), and delayed time to treatment is associated with worse survival (7,8).

Receiving quality colorectal cancer care might be especially problematic for young adults, who historically had the highest uninsured rate in the country (9). In September 2010, the Dependent Coverage Expansion (DCE) under the Affordable Care Act (ACA) went into effect, allowing young adults up to 26 years of age to be covered under their parents' private health insurance. The ACA lead to an increase in health insurance coverage (10,11), use of preventive services (12), and earlier stage of diagnosis for some cancers (4,13) among DCE–eligible individuals. However, the effect of the ACA on access to timely cancer care, such as potentially lifesaving adjuvant chemotherapy, has not been evaluated. The objective of our study is to examine whether DCE was associated with improved care among young adults with colorectal cancer.

We used data from the National Cancer Database, a nationwide hospital-based cancer registry, which includes approximately 70% of all newly diagnosed cancer patients in the United States (14). The "Adolescent and Young Adult Site Recode" scheme (15) was used to identify patients diagnosed with colorectal cancer from January 2007 to June 2010 (pre-ACA) and January 2011 to December 2013 (post-ACA). The second half of 2010 was excluded as a washout and phase-in period. Stage at diagnosis was coded according to the *AJCC Cancer Staging Manual Sixth Edition* (16).

Difference-in-differences (DD) analyses were used to evaluate changes in percentage of patients covered with private insurance and diagnosed with early-stage cancer (0 and I)

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Table 1. DD analyses for health insurance coverage and early stage at diagnosis among young adult colorectal cancer patients, National Cancer Database 2007–2013*

	Age at diagnosis, y									
	19–25				27–34					
	ACA				ACA					
Colon cancer	Before	After	Difference	P†	Before	After	Difference	P†	DD (95% CI)	P†
Private insurance	60.6	66.1	5.5 (1.1 to 9.9)	.02	66.91	62.8	−4.1 (−8.5 to 0.3)	.07	9.6 (3.3 to 15.8)	.004
Early stage	12.8	27.8	15.0 (9.8 to 20.2)	< .001	13.85	18.3	4.4 (−0.8 to 9.6)	.09	10.5 (3.2 to 17.9)	.007

*Excluding second semester of 2010. ACA = Affordable Care Act; CI = confidence interval; DD = difference-in-differences.
†Wald χ^2 test with two-sided *P* values.

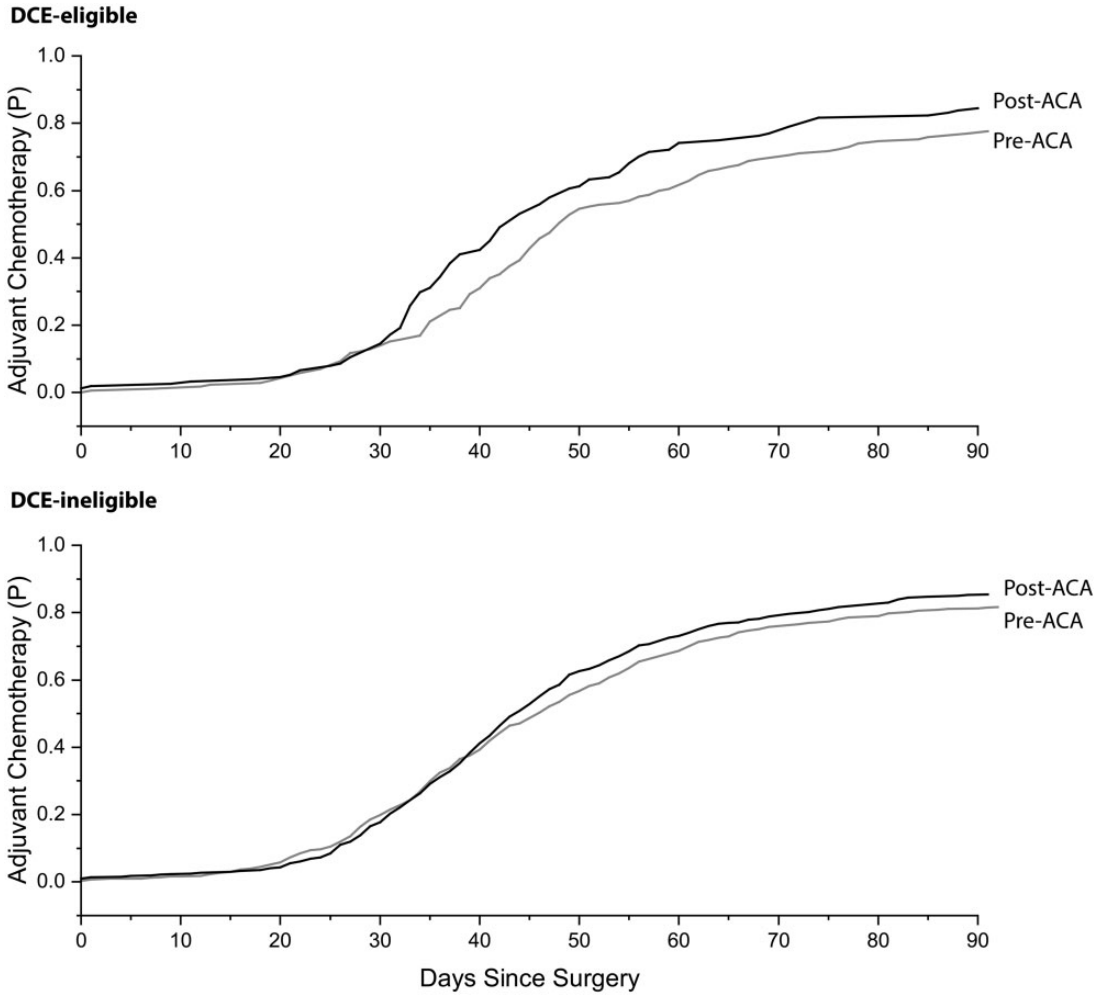

Figure 1. Time to initiation of chemotherapy after receipt of surgery among young adult patients receiving treatment for stage IIB–IIIC colorectal cancer pre- and post–Affordable Care Act (post-ACA), National Cancer Database 2007–2013. Abbreviations: ACA= Affordable Care Act; DCE = Dependent Coverage Expansion. Kaplan-Meier curves restricted at 90 days were used to compare time to receipt of adjuvant chemotherapy between Dependent Coverage Expansion– (DCE-) eligible and DCE–ineligible colorectal cancer patients pre- and post-ACA.

between DCE–eligible (aged 19–25 years) and DCE–ineligible (aged 27–34 years) patients pre- and post-ACA.

Surgically resected stage IIB–IIIC colorectal cancer patients were selected to investigate receipt of timely adjuvant chemotherapy. Patients with missing chemotherapy initiation date (N = 388), who started chemotherapy before surgery (N = 619) or whose records did not meet Commission on Cancer quality standards for treatment and survival analysis (N = 15) were excluded (Supplementary Figure 1, available online). *Time to event* was defined as time between date of surgery and date of initiation of chemotherapy, date of death, or study end (December 31, 2016), whichever came first. Kaplan-Meier curves restricted at

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90 days were used to compare time to receipt of adjuvant chemotherapy between DCE–eligible and DCE–ineligible colorectal cancer patients pre- and post-ACA. Hazard ratios (HRs) were used to evaluate changes in receipt of adjuvant chemotherapy, and restricted mean survival time (RMST) (17,18) was used to evaluate changes in time to adjuvant chemotherapy pre- versus post-ACA (Supplementary methods, available online).

All analyses were conducted in SAS 9.4 (SAS Institute, Cary, NC). Statistical significance level for χ^2 and Wald χ^2 tests was set at 0.05; all tests were two-sided. This study was granted exempt review by the Institutional Review Boards of the Morehouse School of Medicine in Atlanta, Georgia.

Of the 10 237 patients included in the study, 1924 (18.8%) were DCE–eligible. Patient characteristics are displayed in Supplementary Table 1 (available online). As shown in Table 1, there was a shift toward early-stage diagnosis in DCE–eligible patients but not in DCE–ineligible patients. The percentage of DCE–eligible patients diagnosed with early-stage cancer increased statistically significantly from 12.8% pre-ACA to 27.8% post-ACA (15 percentage point difference, $P < .001$). In DCE–ineligible patients, there was a statistically nonsignificant 4.4 percentage point difference ($P = .09$). The DD was 10.5 (95% confidence interval [CI] = 3.2 to 17.9, $P = .007$). The shift toward early-stage diagnosis among DCE–eligible patients but not among DCE–ineligible patients post-ACA was not sensitive to how the dichotomization used to define early stage was done (data not shown). As expected, the percentage of DCE–eligible patients with private insurance coverage increased statistically significantly post-ACA (5.5 percentage points, $P = .02$) but not in DCE–ineligible patients ($P = .07$), leading to a DD of 9.6 percentage points (95% CI = −3.3 to 15.8, $P = .004$).

As shown in Figure 1, DCE–eligible patients resected for stage IIB–IIIC colorectal cancer were more likely to receive adjuvant chemotherapy post-ACA than pre-ACA (HR = 1.34, 95% CI = 1.05 to 1.71, $P = .017$). Furthermore, among DCE–eligible patients, restricted mean time from surgery to chemotherapy decreased from 57.4 days pre-ACA to 50.4 days post-ACA (7.0 days' decrease, $P = .01$). There were no changes in DCE–ineligible patients (HR = 1.10, 95% CI = 0.98 to 1.24, $P = .06$, and 2.1 days' decrease, $P = .41$).

Using a national dataset, we found that implementation of the ACA led to improved colorectal cancer care among DCE–eligible patients, including a shift toward early-stage diagnosis and receipt of timely adjuvant chemotherapy. DCE–ineligible patients did not experience these improvements.

Our results have important implications for young adults diagnosed with colorectal cancer who may experience interruptions in their insurance coverage because of loss of dependent coverage or other life transitions. Previous studies that used older data, did not focus on colorectal cancer, and did not examine ACA–related changes found that having insurance coverage was associated with earlier stage at diagnosis, increased receipt of treatment, and lower mortality in young adults (19,20).

As expected, the ACA improved health insurance coverage among young adults diagnosed with cancer (4,13). A few studies on cervical cancer found a shift toward early-stage diagnosis in DCE–eligible patients (13,21) and increased proportion of patients receiving fertility-sparing treatment post-ACA (13), whereas no statistically significant changes in time to treatment for early-stage breast cancer post-ACA were found (22). However, these studies used older data, focused on aspects of cancer treatment that are not associated with better survival (23), and have been affected by the development of new technologies such as genetic testing (22). Importantly, ours is the first study to show changes in receipt of potentially lifesaving cancer treatment and a shift toward early-stage diagnosis among DCE–eligible colorectal cancer patients post-ACA.

Strengths of this study include the large national sample with detailed clinical and treatment information that allowed for the evaluation of changes in receipt of potentially lifesaving treatment following consensus guidelines. Because the two age groups being compared are not age eligible for colorectal cancer screening, it is likely that our results reflect improved access to care that allows for timely assessment of early symptoms. Study limitations include lack of information on diagnostic pathway and reasons for time to receipt of adjuvant chemotherapy.

Although it is too early to examine differences in survival (7,8), our study is the first to report improved receipt of potentially lifesaving cancer treatment as part of ACA implementation. Future research should evaluate the longer-term effects of the ACA on health outcomes across the cancer care continuum.

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