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Adaptive Strategies for Outpatient Colonoscopies in Response to COVID-19

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INTRODUCTION

The coronavirus disease 2019 (COVID-19) pandemic caused a decline in outpatient colonoscopies that continues at varying levels.[1] To prevent delay in colorectal cancer (CRC) diagnoses, centers strategized to expand fecal immunochemical tests (FITs) and triage symptomatic and FIT-positive colonoscopies.[2,3] Although much has been written about missed CRC diagnoses,[4] few studies have examined the impact of adaptive strategies on CRC and advanced polyp (AP) detection rates.[5] It was hypothesized that these strategies would increase detection rates compared with prepandemic levels owing to the targeting of high-risk patients.

METHODS

After ethics board approval, CRC and AP diagnoses were identified in outpatient colonoscopy records of Boston Medical Center, a tertiary care, safety-net hospital, between January 1, 2017 and June 30, 2021. Boston Medical Center performs 7,429 ± 215 outpatient colonoscopies per year (2017−2019). Adaptive strategies in response to COVID-19 were implemented to (1) strictly use FIT for average-risk CRC screening by educating primary care and gastrointestinal providers, (2) link FIT-positive patients to colonoscopy, and (3) prioritize symptomatic patients. Endoscopy capacity was drastically reduced during the first (March 16−August 3, 2020) and second (December 14, 2020 to March 1, 2021) pandemic surges and was affected by poor show rates.

Colonoscopies performed for screening for CRC, polyp surveillance, positive FIT, symptoms other than diarrhea, follow-up of abnormal imaging, or conditions such as diverticulitis were included, and those for inflammatory bowel disease, diarrhea, history of CRC, and therapeutic indications were excluded (11% of cases). APs were defined as adenomas ≥10 mm or with tubulovillous/villous histology or high-grade dysplasia[6] or sessile-serrated lesions ≥10 mm or with dysplasia or traditional-serrated adenomas.[7] The primary outcome was the frequency of CRC and APs detected per month. Poisson regression modeling, fit with calendar month (owing to seasonality), age, race, sex, and indication, was used to estimate the frequencies of CRCs and APs per month with 95% CIs using data from 2017 to 2019 and assuming similar outpatient volume and patient characteristics as for 2019 in 2020−2021. Observed and expected frequencies under a Poisson distribution were compared using chi-square tests after the first surge when adaptive strategies were fully implemented.

RESULTS

After the first and second COVID-19 surges, there were 27% (434 vs 592) and 15% (493 vs 577) fewer colonoscopies per month, respectively, than in 2019. The actual and predicted number of CRC and APs detected by outpatient colonoscopies per month are presented in Figure 1.

Between August 2020 and February 2021, an average of 2.3±1.4 CRCs were detected per month (0.63 per 100 colonoscopies), which was comparable (chi-square=6.12 df=5, p=0.2872) with the expected frequency of 2.5±1.3 per month (0.45 per 100 colonoscopies). However, between March and June 2021, the observed frequency of 4.3±2.1 CRCs detected per month (1.25 per 100 colonoscopies) was significantly higher (chi-square=11.38, df=2, p=0.0034) than the expected frequency of 2.8±0.6 per month (0.48 per 100 colonoscopies).

Between August 2020 and February 2021, the observed frequency of APs detected per month was significantly lower than the expected frequency (chi-square=36.9, df=5, p<0.00001), although AP detection rate was similar (7.3 vs 8.0 per 100 colonoscopies). Between March and June 2021, the observed frequency of APs detected per month was higher at 40.0±10.7 (11.75 APs per 100 colonoscopies) than an expected frequency of 36.2±10.7 (6.3 APs per 100 colonoscopies) (chi-square=10.8, df=2, p=0.0045).
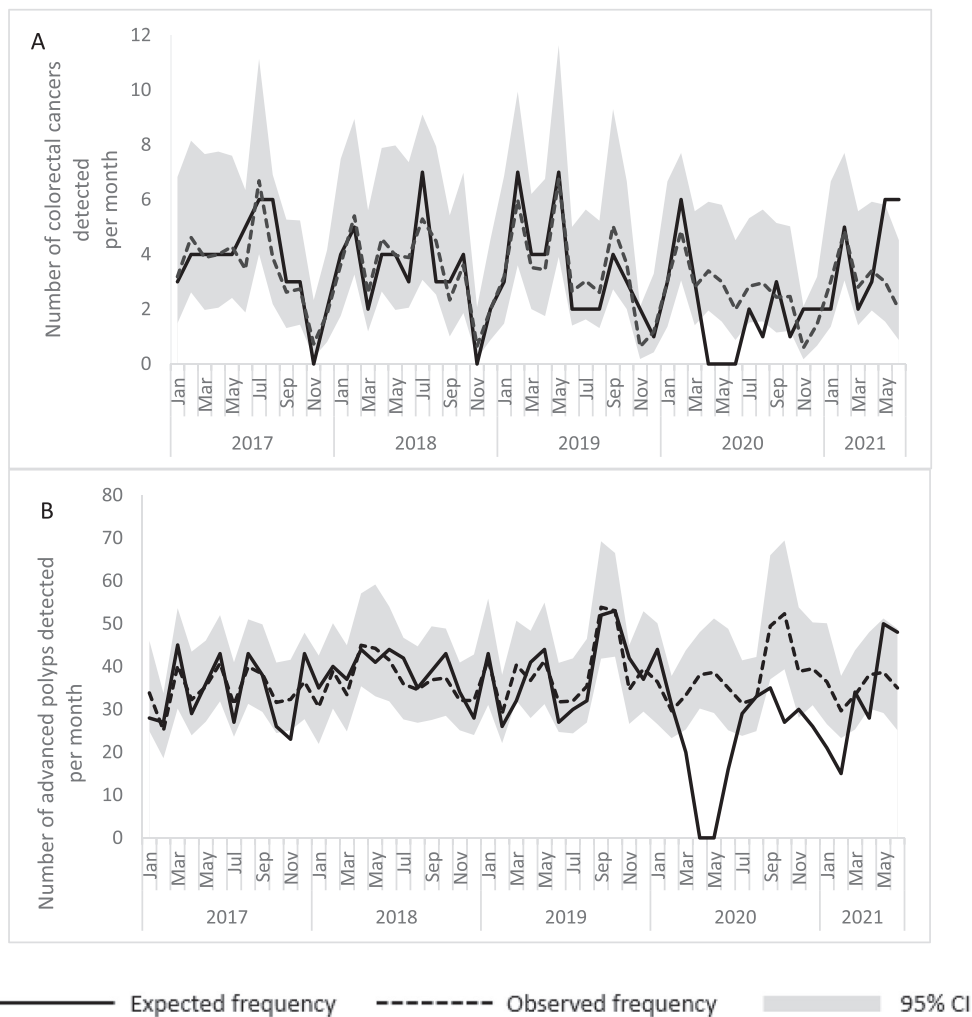
Figure 1. (A) Expected versus observed number of colorectal cancers detected per month (with 95% CI) from January 2017 to June 2021. (B) Expected versus observed number of advanced polyps detected per month (with 95% CI) from January 2017 to June 2021.
Apr, April; Jan, January; Jul, July; Mar, March; Nov, November; Oct, October; Sep, September.

DISCUSSION

Adaptive strategies for outpatient colonoscopies in response to COVID-19 led to higher CRC and AP diagnoses per month than predicted values by June 2021 because colonoscopies were performed on patients with a higher risk of CRCs or APs. FIT-positive and symptomatic patients were both prioritized because they had similar rates of CRC detection (1.7 per 100 colonoscopies). CRC and AP detection per month were higher in the second postsurge period potentially owing to better show rate and streamlining of strategies.

Adaptive strategies were less effective for APs because the sensitivity of FIT for advanced adenomas is low.[8] The first postsurge period also had more symptomatic patients with a lower AP detection rate than FIT positive (5.5 vs 19.6 per 100 colonoscopies). Further studies are needed to understand the long-term impact of these strategies on AP detection, CRC prevention, and stage of CRC diagnosis.

This study shows that adaptive outpatient strategies for the COVID-19 pandemic can potentially mitigate the previously predicted increase in CRC incidence and mortality. In this study, key outcomes were evaluated using robust prediction models in a real-world scenario where experimental approaches were impractical. The results are potentially generalizable because the study population is diverse, and centers nationwide have faced similar disruptions.

CREDIT AUTHOR STATEMENT

Heidi S. Ahmed: Conceptualization, Data curation, Investigation, Writing - original draft. James J. Connolly: Data curation, Investigation. Writing - review and editing.

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