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Reduction in Inflammatory Bowel Disease Healthcare During the Coronavirus Disease 2019 Pandemic: A Nationwide Retrospective Cohort Study

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Coronavirus disease 2019 (COVID-19) caused a worldwide disruption of regular health care, with more than 37 million cases and over 1,000,000 deaths.¹ After confirmation of the first COVID-19 patient in The Netherlands, a country with 17.4 million inhabitants and universal health care, on February 27, 2020, the pandemic rapidly spread across the country, reaching its first peak in April 2020.² Regular health care, including inflammatory bowel disease (IBD) care, was strongly reduced to establish sufficient capacity for COVID-19 care and to prevent COVID-19 spread by patients and healthcare workers.

IBD health care includes scheduled outpatient monitoring and endoscopic or surgical procedures. Because of decreased hospital capacity for non-COVID-19 care, many IBD-related appointments and procedures were canceled or postponed. In addition, initial confinement measures to prevent the spread of COVID-19 had an emphasis on safeguarding vulnerable populations, including IBD patients.³ Most consultations for general practitioners transitioned to tele-health or did not take place at all because of flooding of practices by COVID-19 care. Finally, fear of COVID-19 increased the risk of delayed care-seeking behavior by patients, leading to less hospital visits.⁴

The exact consequences of these factors on regular IBD health care are unknown. This information may provide guidance for patients and healthcare workers to prevent mortality and morbidity in the IBD population and could aid in improved healthcare management and prioritization during a new outbreak. Therefore, we aimed to determine the decrease in delivered IBD health care during the COVID-19 pandemic of 2020 in comparison with national data from 2018 to 2019 by using a pathology database with full nationwide coverage.

Methods

We conducted a search (starting August 28, 2020) in PALGA (the nationwide network and registry of histo- and cytopathology in the Netherlands) to identify IBD-related endoscopies or surgery, new diagnoses of IBD, or IBD-related dysplasia and colorectal cancer (CRC) in a nationwide retrospective cohort study.⁵ Incidences of these procedures and diagnoses were determined and displayed using graphs up to week 32 and compared with mean incidence data from 2018 to 2019. The COVID-19 pandemic in the Netherlands was defined as the

period from February 27, 2020 to August 9, 2020 (week 32).² More details are provided in the [Supplementary Methods](#).

Results

The PALGA search resulted in 66,684 IBD-related procedures, of which 61,097 procedures were eligible after exclusion of non-IBD diagnoses.

IBD-related Procedures

A decline in total incidence of IBD-related procedures (endoscopy and surgery) was seen during the COVID-19 pandemic. At the national peak of the pandemic in April 2020, a maximum decrease of 59.7% (310 procedures) was observed compared with the mean incidence in April 2018 to 2019. Although a relative increase of IBD procedures was seen in the subsequent weeks, an overall decrease of 14.2% (1476 procedures) was present for the total COVID-19 pandemic period compared with the same period in 2018 to 2019. Endoscopic and surgical procedures showed a net decrease of 14.7% (1443 procedures) and 5.5% (33 procedures), respectively ([Figure 1](#)).

New IBD Diagnoses and IBD-related Dysplasia or CRC

New IBD diagnoses during the COVID-19 pandemic decreased by 6.5% (125 diagnoses) compared with 2018 to 2019, with a maximum decrease of 46.3% (30 diagnoses). Indefinite and low-grade dysplasia diagnoses decreased by 25.5% (214 diagnoses). No decrease was seen for high-grade dysplasia or CRC diagnoses.

Abbreviations used in this paper: COVID-19, coronavirus disease 2019; CRC, colorectal cancer; IBD, inflammatory bowel disease; PALGA, the nationwide network and registry of histo- and cytopathology in the Netherlands.

Most current article

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0016-5085

<https://doi.org/10.1053/j.gastro.2020.10.032>

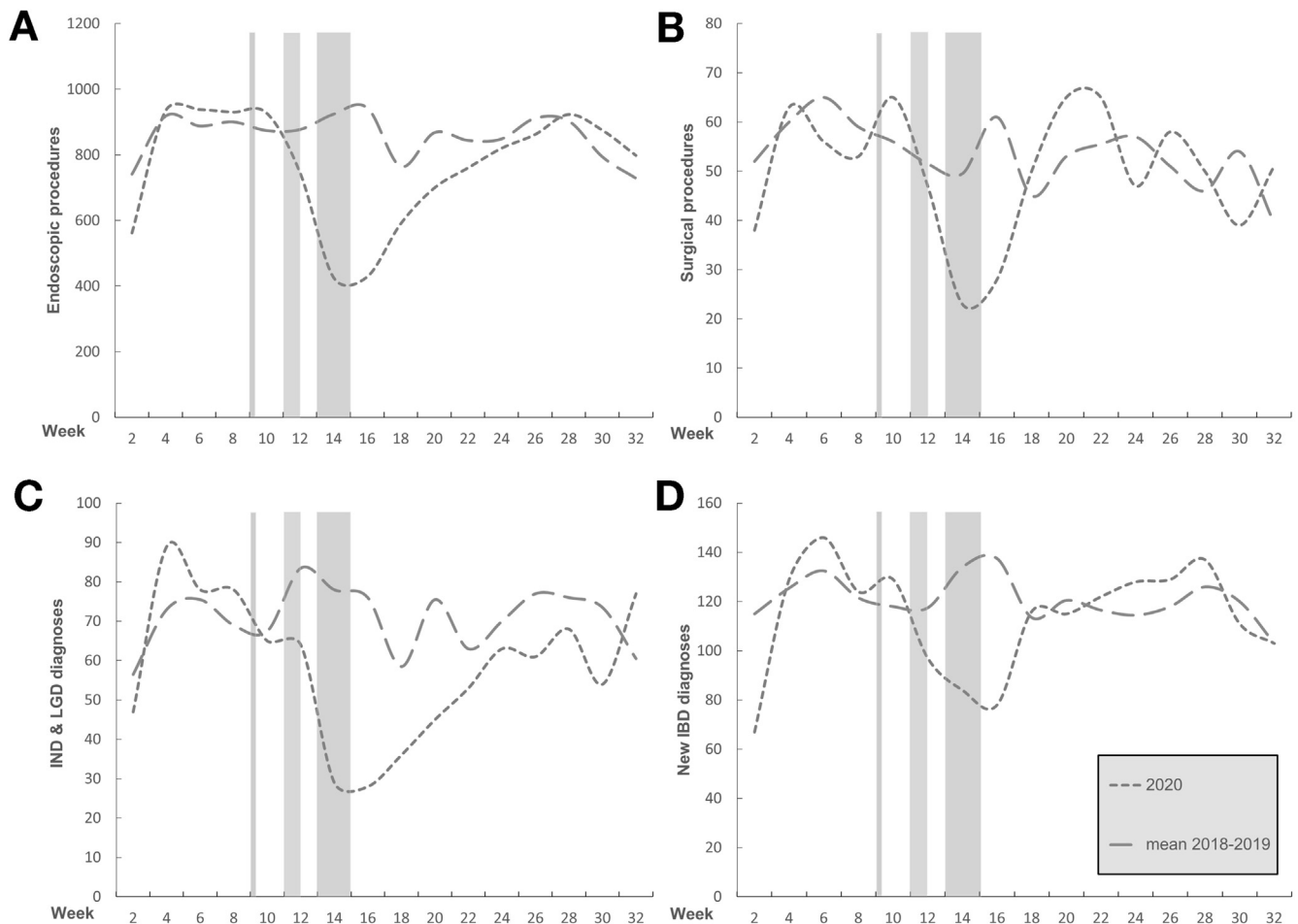


Figure 1. (A) Total IBD-related endoscopic procedures, (B) surgical procedures, (C) indefinite dysplasia and low-grade dysplasia (IND and LGD) diagnoses, and (D) new IBD diagnoses. Green bar, February 27, 2020, first case of COVID-19 in The Netherlands; yellow bar, nationwide confinement measures implementation; orange bar, peak of COVID-19-related hospitalizations in The Netherlands.

Discussion

In this nationwide retrospective cohort study we found a large reduction in IBD health care during the COVID-19 pandemic. At the height of the pandemic, almost 6 of 10 IBD-related procedures were canceled or postponed. Importantly, in the months of recovery after the peak of the pandemic this deficit was not fully compensated, leading to a net decrease in IBD-related procedures of approximately 14% compared with 2018 to 2019.

The decrease in IBD-related procedures was smaller for surgical procedures compared with endoscopic procedures (5.5% vs 14.7%). In addition, no decrease in high-grade dysplasia and CRC diagnoses was seen. Both can be explained by higher prioritization, because the indication for surgery is often based on high-grade dysplasia, CRC, or severe disease. Furthermore, these patients are more likely to present themselves with symptoms resulting from the underlying malignancy (anemia, rectal bleeding) than those with indefinite dysplasia or low-grade dysplasia, leading to timely referral.

Several clinical implications can be drawn from this study. First, the incomplete recovery of missed procedures and diagnoses implicates there are still patients with undiagnosed dysplasia at risk of progression to CRC. A recent study estimated that a 3-month delay in cancer surgery because of worldwide COVID-19 care reduces the benefit in life-years gained of all COVID-19 care by 19%.⁶ This implies that optimization of healthcare management is needed to prevent negative outcomes for patients because of insufficient regular health care, including IBD health care. Second, the decrease in IBD-related procedures during the COVID-19 pandemic will allow evaluation of the current CRC surveillance practice. Further research into mortality and morbidity after the COVID-19 pandemic will open opportunities for appraisal and possible improvement of stratification and surveillance strategies.

This study has multiple strengths, including the use of the nationwide PALGA database with excellent national coverage, with confirmed accuracy for IBD and IBD-related diagnoses.^{7,8} There are also limitations. First, our results

represent the procedures where histology was acquired, excluding endoscopic procedures without tissue sent for histologic evaluation. However, this might correlate with an absence of need to obtain a biopsy specimen (no suspicion of dysplasia/CRC or inflammation), likely limiting the consequences of postponement for these patients. Second, because of the nature of PALGA, no data on type of endoscopy (surveillance or not), therapy, or mortality were available. Nevertheless, the true consequences of the COVID-19 pandemic on effective surveillance, therapy, and mortality are likely not measurable yet, opening possibilities for future research in the upcoming years.

In conclusion, in this nationwide study we observed a decrease in IBD endoscopy and surgery during the COVID-19 pandemic. Although the use of procedures has returned to comparable levels with preceding years, a deficit remains while the strong decrease in dysplasia diagnoses is concerning. These data may help healthcare providers and hospitals in planning health care during a second peak of COVID-19 in the near future.

Supplementary Material

Note: To access the supplementary material accompanying this article, visit the online version of *Gastroenterology* at www.gastrojournal.org and at <https://doi.org/10.1053/j.gastro.2020.10.032>.

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Received October 13, 2020. Accepted October 20, 2020.

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Conflicts of interest

The authors disclose no conflicts.

Funding

None.

Supplementary Methods

Data Source

This study was approved by the nationwide network and registry of histopathology and cytopathology in The Netherlands' (PALGA) privacy commission and scientific council (Izv-2020-123). All data in this registry are pseudonymized with unique identifiers linked to individual patients. This registry has had complete national coverage since 1991. A search of the PALGA database is able to correctly identify 92% to 95% of all IBD patients, which was previously validated with individual patient records.^{7,8} The PALGA search was performed with the terms "ulcerative colitis," "Crohn's disease," "indeterminate colitis," and "chronic inflammatory bowel disease" for IBD, combined with a search of pathologists' report conclusions using similar terms.

Definitions

IBD diagnosis was based on histology results from biopsies or resection specimens. New IBD diagnoses were defined as absence of an historical PALGA report confirming IBD in combination with a present report with a PALGA diagnosis of IBD. IBD-related surgery and endoscopic procedures were defined by the type of PALGA report (eg, a resection specimen or intestinal biopsy). Reports of individual patients from a single date were considered to be from the same procedure.

Inclusion and Exclusion Criteria

All IBD patients (with an established diagnosis of ulcerative colitis, Crohn's disease, or IBD unclassified) were eligible for inclusion. Exclusion criteria were a missing PALGA diagnosis of IBD in combination with absence of an IBD diagnosis in the pathologists' conclusion of the reports.

Data Collection

Extracted variables from the PALGA database were date of biopsy or resection, type of dysplasia (indefinite, low-grade, or high-grade dysplasia) or presence of CRC and new IBD diagnosis. A screening of all individual histology records was performed to exclude any false-positive IBD-related diagnoses.

Statistical Analysis

Incidence rates were assessed with SPSS version 25 (IBM, Armonk, NY). Because we used complete nationwide data, sampling error is not an issue for interpretation of results for The Netherlands. In relation to other countries struck by COVID-19, sampling error is likely to be small in comparison with major incidence influencing factors like differences in confinement measures and healthcare policies. Therefore, we did not present confidence intervals or *P* values in this article because these only represent sampling error and could be misleading in this context.