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Hospitalisation, surgical and medical recurrence rates in inflammatory bowel disease 2003–2011—A Danish population-based cohort study

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Abstract

Objective: The aim of this study is to evaluate the cumulative probability of recurrence and admission rates in an inflammatory bowel disease (IBD) inception cohort diagnosed in 2003–2004.
Methods: Data on medications, phenotypes and surgery for 513 individuals with ulcerative colitis (UC, *n* = 300) and Crohn's disease (CD, *n* = 213) were obtained from medical records and linked to population-based health administrative database information. The admission rates and cumulative probability of recurrences were estimated, and the association with the baseline factors and medication was tested.

Abbreviations: 6-MP, 6-Mercaptopurine; Anti-TNF, Anti-tumour necrosis factor alpha; AZA, Azathioprine; CD, Crohn's disease; CE, Capsule endoscopy; CPR, Central person registration; CT, Computed tomography; ECCO, European Crohn's and Colitis Organisation; EC-IBD, European Collaborative Study Group on Inflammatory Bowel Disease; NPR, The National Patient Registry; MRI, Magnetic resonance imaging; IBD, Inflammatory bowel disease; IBDU, Inflammatory bowel disease unclassified; IMM, Immunomodulators; RCT, Randomised clinical trial; SMI, Small bowel imaging; UC, Ulcerative colitis; US, Ultra sonography.

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Results: The cumulative risk of first recurrence after 1, 5 and 7 years was 40%, 63%, and 66% in CD patients and 51%, 75%, and 79% in UC patients, respectively. The cumulative risk of first surgical relapse was 6%, 18%, and 23% at 1, 5 and 7 years in CD respectively. One hundred and CD patients (66%) and 142 UC patients (47%) had at least one IBD-related hospitalisation. The hospitalisation rate decreased from 7.0 days/person-year in year one to 0.9 day at year 5 in CD, and from 4.7 days to 0.4 days for UC patients. Age above 40, current smoking, stricturing behaviour, and disease localisation (colonic, ileocolonic, and upper-GI) at diagnosis were predictors of recurrence in CD. In UC, age above 40 and former smoker status were predictors of recurrence and left-sided and extensive colitis were predictors of first-time hospitalisation.
Conclusion: In an era of improved treatment options, the recurrence rates, but not the surgery or hospitalisation rates, have decreased for CD but not for UC. The phenotypic characteristics at diagnosis predict the risk of recurrence and hospitalisation.

1. Introduction

Ulcerative colitis (UC) and Crohn's disease (CD) are inflammatory bowel diseases (IBDs) of unknown aetiology. The clinical course is often unpredictable, although continuous effort has been made to identify the factors that predict outcome.[1,2] The disease course ranges from indolent with prolonged periods of remission to a chronic continuous course with incapacitating symptoms. Severe cases may lead to medical refractory disease and surgery. In the late 1990s biological therapy (i.e., anti-TNF agents) was introduced in the treatment of IBD and treatment with immunomodulators (IMM) is now more frequently used.[3,4] A recent meta-analysis showed that the surgical rates over the last decades have been declining[5]; however, a causal relationship with the altered treatment regimens could not be demonstrated. Several population-based studies from Europe and North America have addressed the clinical course of CD over decades and have focused on trends in medication use and surgery rates,[3–7] whilst fewer studies describe the clinical course of UC in this way.[8,9] However, all of these studies were developed before the introduction of biological therapy and in a period where immunomodulators were offered to fewer patients. Furthermore, the relapse rates prior to this new treatment era were reported to be rather high (69%–86% in CD and 78% in UC) after 5 years of follow-up in population-based studies.[10–12] Patients with IBD are mainly treated in outpatient clinics and only hospitalised during serious and incapacitating flare-ups.[13] More recent studies indicate that hospitalisation rates have declined, whilst outpatient visits have increased.[14] This change is most likely a consequence of institutional changes although a lowered need of hospitalisation could potentially be associated with improved remission rates.

The aim of the present study was to assess the recurrence and admission rates in a Danish population-based cohort in the new treatment era after 7 years of follow-up. Additionally, we assessed the association of baseline factors and IBD treatment with the recurrence rates, admission rates and surgery.

2. Methods

2.1. Study population

From January 1, 2003 to December 31, 2004, all patients diagnosed with UC, CD and IBD-unclassified (IBDU) in a well-defined Copenhagen area from a reference population of 1,211,634 residents (23% of the total population of Denmark) were included in an inception cohort.[15] Registration was carried out at 28 specialist practitioners (gastroenterologists and surgeons) and in 10 departments of gastroenterology and internal medicine, including 2 paediatric units, covering all 8 hospitals in the region. Medical records were reviewed from November 1, 2011 to November 30, 2012. In all cases the diagnosis was re-evaluated according to the Copenhagen criteria[16,17]. The follow-up period was from the date of diagnosis to December 31, 2011. Data on medical treatment, disease localisation and behaviour, diagnostic procedures (endoscopy, MRI-/CT-scans, ultrasound, capsule endoscopy) and surgical procedures were registered prospectively. Phenotypic classification was recorded by the use of the Vienna classification in CD.[18] In UC, the extent of disease was defined as proctitis, left-sided colitis (inflammation with maximum extent to the splenic flexure) and extensive colitis (inflammation beyond the splenic flexure). Details on the inclusion, exclusion and phenotypic definitions have been described previously and can be assessed in the supplementary material.[15,19]

The unique 10-digit personal identification number (CPR-number) allocated to all Danish citizens at birth enabled us to perform complete follow-up in the Danish National Patient Registry[20] with respect to hospital admissions and surgical procedures.

2.2. Definitions

In Denmark an admission is registered with a primary code (diagnosis of action) and a secondary code(s), referring to conditions or diseases that are relevant to the primary diagnosis. An admission was defined as IBD-related when the primary codes were CD (DK50.x), UC (DK51.x) or pre-defined conditions related to IBD (see supplementary material).

Recurrences were recorded as 'all type', 'non-surgical', or 'surgical' as previously described by Romberg-Camps et al.[7] and in earlier publications of the European Collaborative Study Group on Inflammatory Bowel Disease (EC-IBD)[10,21] with modifications. Non-surgical (medical) recurrence was defined as an episode of increased disease activity, leading to an increased dose of current medication or the addition of a new medication. Surgical recurrence was defined as an