Student: Vikesh Gupta

Title: IBD Incidence in Canterbury, New Zealand

Supervisor(s): Associate Professor Richard Gearry and Professor Andrew Day

Sponsor: Christchurch Gastroenterology Research Trust

Introduction:

Inflammatory Bowel Disease (IBD) is a complex collection of disorders which present with inflammation of the bowel. The bowel wall becomes red, swollen and ulcers may be present, all of which lead to disruption of the normal digestive processes. Patients diagnosed with IBD often suffer from diarrhea, abdominal pain, abdominal bleeding and may have severe weight loss.

Crohn's disease (CD), ulcerative colitis (UC) and IBD unclassified (IBDU) are all encompassed under the definition of IBD. Although CD and UC share common features, both have unique characteristics that are used to differentiate between them. CD can occur anywhere from the mouth to the anus, whereas UC is found only in the colon. IBDU represents a form of IBD where initial findings do not distinguish between CD and UC.

IBD are increasingly significant health problems worldwide, with many studies showing increasing rates in recent years. A landmark study completed in 2004 found that Canterbury, New Zealand, had one of the highest incidence rates in the world. The incidence (number of new cases per population in a given time period) of CD in Canterbury in 2004 was 16.5/100,000 population. However, there are no longitudinal data concerning IBD incidence from any population based centre in the southern hemisphere.

Canterbury is well positioned to perform population based epidemiological studies due to the geography and nature of healthcare delivery. The timing of this study is also opportune given a national census was performed in 2013. This is an essential piece of data due to population changes that may have occurred in Canterbury following the 2010/2011 earthquakes.

Aims:

We aimed to identify all new diagnoses of IBD in the CDHB catchment between 1 January and 31 December 2014. In addition, we aimed to characterize these patients further in terms of key factors such as age at diagnosis, gender, and disease location to enable the analysis of trends in incidence changes over the decade since the initial study was performed in 2004.

Methods:

The Canterbury region was defined using the Canterbury District Health Board (CDHB) boundaries as stipulated by the territorial authorities' in the 2013 census from Statistics New Zealand. Because the New Zealand health system has no diagnostic or therapeutic registry data, patients attending both public and private clinics and hospitals need to be identified for epidemiologic studies. To accumulate all new cases in the public system, all colonoscopy reports from the endoscopy database, *Provation*, were read. Those indicative of a new IBD diagnosis were followed up through examination of the histology reports to confirm if a diagnosis had been given. Furthermore, all capsule endoscopy reports were viewed in the public system. Those patients being considered for new IBD diagnoses had their clinic letters followed up to determine if a diagnosis had been finalized.

Computer records from all private clinics in Canterbury were screened using text searches for the words "Crohn" and "colitis". Case notes were reviewed and those with new IBD diagnoses were included in the study.

To help with recruitment of incident cases prospectively, gastroenterologists and surgeons were informed of the study both by letter and meetings. Any patient with a new IBD diagnosis would have their details forwarded onto investigators so specific clinical information could be extracted.

The diagnosis was confirmed according to recognized and accepted criteria. Other diagnoses were rigorously excluded. Participants who did not live in Canterbury were excluded from the study, as were participants who did not have IBD confirmed by standard criteria. If there was doubt as to the diagnosis or if insufficient data was available to confirm the diagnosis, the case was discussed with the patient's clinician. All results were reviewed before a final decision on inclusion in the study. If there was still doubt concerning the diagnosis, then the patient was excluded. In addition to fulfilling these diagnostic criteria, patients were phenotyped according to the Montreal Classification.

Incidence rates were calculated for CD, UC, and IBDU for the period January 1 2014 to December 31 2014. Projected population data for age and sex were obtained from the Department of Statistics. Annual incidence rates for 2014 for both sexes were calculated based on the number of patients diagnosed and the population size. Incidence rates were then age standardized using the World Health Organization (WHO) Standard Population to allow comparison with other regions..

Results:

Overall 205 patients were diagnosed with IBD in Canterbury in 2014. 134 patients were diagnosed with CD, 69 with UC and 2 with IBDU. 100 (49%) of the patients were male. For 2014, the crude incidence rate for IBD per 100,000 was 39.8 (95% CI, 34.4 – 45.3), for CD 26.0 (95% CI, 21.6 – 30.4), for UC 13.4 (95% CI, 10.2 – 16.6), and for IBDU 0.39 (95% CI, -0.15 – 0.93). There was a peak of incidence for both CD and UC between 20 and 54 years of age. The age specific IBD incidence rates were standardized, peaking in the 20-24 year old age bracket, and remaining relatively stable up to 54 years old before gradually declining with age. The majority of patients diagnosed with Crohn's disease had ileocolonic disease that was non-stricturing and non-penetrating. Most patients diagnosed with Ulcerative Colitis had pancolonic disease.

Conclusion:

Overall, this study has prospectively defined the descriptive epidemiology of IBD in the Canterbury region of New Zealand in 2014. IBD, CD and UC incidence rates were 39.8, 26.0, and 13.4/100,000 respectively. These results indicate substantial increases in the incidence of these chronic conditions in the Canterbury region. Rates of IBD have risen by approximately 150% over the last decade. This Canterbury IBD Project will be a valuable tool for future population based IBD epidemiology and outcomes research.