

Student: Callum Davidson

Title: Outcomes of Colorectal Cancer in Christchurch: A Four Cohort Study

Supervisor(s): Professor Frank Frizelle

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Introduction:

Bowel cancer (colorectal cancer) is a major health problem in New Zealand as we have one of the highest rates in the world. The Ministry of Health reported in 2009 that bowel cancer was the 2nd most commonly diagnosed cancer for women, men and overall, with 2787 patient diagnosed that year. There were 1219 deaths due to bowel cancer during 2009, the 2nd highest number of deaths of any cancer.

In 2013, a study looked at previous cohorts of patients diagnosed with colorectal cancer - 355 from Jan 1993 to Dec 1994, 317 from Jan 1998 to Jun 1999 and 419 from Jan 2004 to Dec 2005. This recorded diagnostic and treatment variables and found that patients had both earlier stage disease and were more likely to receive adjuvant treatment (radiotherapy or chemotherapy) in the 2004/05 cohort compared to earlier cohorts.

Aims:

Our aim was to replicate the 2013 study comparing the previous cohorts 1993, 1998 and 2004 cohort. The purpose of this was to identify trends and changes between the four cohorts' disease characteristics, management and survival time.

Methods:

The methods used in the 2013 study were replicated in this study to ensure consistency in data collection and analysis.

The new cohort of patients included those who had been diagnosed for the first time with adenocarcinoma, the most common type of bowel cancer, in 2009 (1-1-09 to 31-12-09), and had also received at least part of their treatment at Christchurch Hospital. Patients who had surgery at a private hospital were also included if they were referred to the oncology department for further treatment. Patients were identified from Christchurch Hospital discharge records, oncology records and pathology records, to form a study population of 300 (229 colonic and 71 rectal patients).

Data was collected using electronic medical records. Demographics such as gender and age were collected as well as dates of surgery, the date last seen or of death, type of operation, features of the cancer such as stage, location and spread, as well as oncological treatment. A statistical analysis was undertaken comparing a variety of the variables to the survival of the patients over time.

Results:

The data from the 2009 cohort was of 296 patients, of which 150 were male and 146 female. The median age was 71 with an age range from 32 to 94.

Initial results from the comparison of cohorts show that the proportions of each surgical procedure (type of operation) used is similar in each cohort. The first two cohorts show a decrease in the number of permanent stomas with 50% in the initial cohort, dropping to 37%, then 33%, and now 32% in patients with rectal cancer.

There has been an increase in the proportion of both colonic and rectal cancer patients referred to oncology, with colon cancer referrals increasing from 32% of patients to 70% over the 4 cohorts and rectal cancer referrals increasing from 54% to 92 over the same period.

With this increased referral rate to oncology there has been an increase in use of oncology services, with an increase in the number of patients with colon cancer receiving chemotherapy over the 4 cohorts from 8% to 40%. Levels of pre-operative radiation for rectal patients have also steadily increased from 27% in the first cohort to 82% in the latest.

Survival appears to be improving over the 4 cohorts. Overall, 56% of patients in the 2009 cohort were alive at 5 years. There was no significant ($p>0.05$) improvement in survival related to gender. However, the 5 year survival was related to the disease stage, with stage 1 (early stage) 5 year survival being 80%, stage 2 being 66%, stage 3 being 56%, and stage 4 (advanced and metastatic disease) being 14%.

Surprisingly patient with rectal cancer had a significant ($p<0.05$) better 5 year survival than those with colon cancer 52.4% of patients were colon cancer were alive at 5 years while for patients with rectal cancer it was 66.2%.

Survival curves are being developed to compare survival outcome between cohorts, and how this is related to stage of disease.

Conclusion:

To conclude, the proportion of bowel cancer patients being referred and utilizing oncology services is increasing. Survival appears to be improving overall, however further analysis is required to compare the outcomes of comparative stages over the 4 cohorts.