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Project: Change in the age of presentation and site of colorectal cancer in New Zealand over the last 20 years

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Introduction:

New Zealand has one of the highest rates of bowel cancer (colorectal cancer) in the world and bowel cancer was the third most commonly diagnosed cancer in New Zealand in 2012 with 3016 cases, behind only breast cancer (3054) and prostate cancer (3129). It is the second most common cancer for both males and females in New Zealand, behind prostate and breast cancer respectively and had the second highest number of deaths from any cancer with 1283 in 2012, with only lung cancer leading to more deaths (1628).

Bowel cancer is cancer of the colon or rectum, which can be divided into 3 main areas - proximal bowel (nearest the small bowel), distal bowel and rectum (nearest the anus). Recent studies have suggested an increase in the number of proximal cancers relative to the number of rectal cancers. Other studies have shown the rate of young people diagnosed with bowel cancer is also increasing.

Aim:

To determine if any change in site or age of diagnosis of bowel cancer has occurred between 1995 and 2012.

1995 was chosen for reliability of the data, as it only became mandatory to report all cancer diagnoses to the New Zealand Cancer Registry in 1994.

Method:

First we conducted a review of literature to understand the international trends in bowel cancer rates. We identified 23 studies that looked at age-related incidence (rate) and the site distribution within the bowel, of bowel cancer. The majority of these reported a trend of proximal cancers becoming more common in older age groups, while describing an increase in the rate of rectal cancer in younger people.

New Zealand Cancer Registry (NZCR) data was obtained from the Ministry of Health along with New Zealand population data. This was organised into three age groups - under 50, 50 to 80 and over 80 years old.

Each of these age groups were divided into the three sites mentioned previously (proximal, distal and rectum), based on the location of each of the cancers.

We hypothesised that the proportion of proximal cancers in young people is increasing, accounting for the patterns of a proximal shift and an increase in the number of young people with bowel cancer and then carried out statistical analysis.

Results:

The initial analysis compared the trends in the three age groups (<50, 50-80 and 80+). We found in the under 50 group an increase of 0.05 cases of colorectal cancer per 100,000 people per year. Given there are approximately 5 cases per 100,000 people under 50 per year, this is a 1% increase each year.

In the 50 to 80 year group, there was a decrease in incidence rate of 3.06 per 100,000 per year and in the 80 and over group, an increase of 3.34 per 100,000 per year.

All of these trends were statistically significant ($p < 0.05$). Each age group was then divided by site in the bowel (proximal, distal and rectum) and the trends from 1995 to 2012 were again analysed. In the under 50 group, only the rectum showed a statistically significant trend ($p < 0.05$), with an increase of 0.03 per 100,000 people per year. This result did not support our initial hypothesis that proximal cancer is increasing in young people.

The 50 to 80 years age group produced the most interesting result, with a decrease of 1.05, 0.84 and 1.18 per 100,000 people per year for the proximal bowel, distal bowel and rectum respectively, each of which was statistically significant ($p < 0.05$).

This decrease is not understood but it may be due to increased awareness of bowel cancer in the community. More people are aware of symptoms and many people are even undergoing colonoscopies to view the bowel lining for growths before symptoms arise.

A study on the New Zealand milk-in-schools programme that ran from 1937 to 1967 showed greater milk consumption was associated with decreased risk of bowel cancer, so this may be another explanation.

Finally, the over 80 years group was subdivided and the results showed a significant ($p < 0.05$) increase in the rate of proximal cancers at 4.21 per 100,000 people per year. This equivalent to almost 80 more people a year diagnosed with bowel cancer for every 100,000 people over 80 in 2012 compared with 1995. Rates of both distal and rectal bowel cancer did not change significantly.

Conclusion:

The initial hypothesis that the rate of proximal bowel cancer is increasing in young was not supported by NZCR data, but the increase in rectal cancer rate in the <50 group is consistent with international literature.

Both this result and those from the 50-80 and over 80 years groups are not well explained and further insight into environmental factors that contribute to bowel cancer development and rates is necessary for more suitable explanations.

A comprehensive analysis is required to improve our understanding of this data.