Cancer, Care and Comorbidity

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Why do we care?

Comorbidity:
• is common among cancer patients.
• has a major impact on patients.
• has a major impact on health services.
• Is an important driver of inequities.
• the effects of comorbidities are modifiable.
Talk in three parts

1. Background
   – Cancer and comorbidity

2. Recent research findings

3. Implications and ways forward
How does cancer interact with comorbidity

• How does comorbidity impact on:
  – Treatment for cancer?
  – Outcomes from cancer?
  – Inequalities in outcomes from cancer?
How does comorbidity impact on treatment?

Those with comorbidity are less likely to receive curative treatment for cancer than those without.
Impact on treatment

• Why?
  – Concern by clinician that treatment may be less effective among those with comorbidity
  – Concern by clinician or patient that comorbidity will increase toxicity of treatment.
  – Life expectancy is insufficient to justify treatment
  – Patient more likely to decline treatment
Impact on treatment

– 190 patients with stage III colon cancer
– Those with comorbidity were considerably less likely to receive chemotherapy
  • 84% without comorbidity (Charlson comorbidity score=0) cf
  • 19% with comorbidity (Charlson comorbidity score of 3+)
– Among those with highest comorbidity there was around a 60% reduction in excess risk of death if offered chemotherapy.

What a clinician needs to know...

• Is treating my patient going to cause more harm than good?
Benefits and harms of treatment

• Studies generally show that those with comorbidity who are treated do better than those who are not treated.

• Best evidence is from RCTs or observational studies that use special methods to ‘mimic’ RCTs (e.g. propensity scores)
Impact on outcomes

- Comorbidity has been found to have an adverse impact on survival in every cancer site investigated.
- Quality of life
- Costs of care
- Complexity of care
- Impact of cancer on comorbidity outcomes
Not all good news… (inequities)

Ethnic inequities in colon cancer survival

Comorbidity and treatment/health service factors each accounted for a third of the survival difference.

Why does comorbidity affect survival?

– Direct effect
– Indirect effect because of reduced cancer treatment
– Effect of comorbidity on cancer progression
  • Recurrence more likely in those with diabetes even in context of RCT (Meyerhardt et al 2003)
Cancer, Comorbidity and Care (C3) projects

Cancer, Comorbidity and Care: Key findings from the C3 (Quantitative) Study

As people age, their chances of being diagnosed with a serious chronic illness such as heart disease or diabetes increase — so does the probability that they will be diagnosed with cancer.

Because of this, people diagnosed with cancer may also be living with one or more other chronic conditions, or comorbidities. Comorbidity may interfere with the usual care a cancer patient might expect to receive, and may also reduce their chance of surviving their cancer.

Research in New Zealand has shown that Māori patients with cancer have poorer cancer survival than non-Māori patients even if the extent of the disease is about the same. Māori suffer higher rates of many cancer types, and are also known to have higher rates of many chronic diseases including heart, respiratory, and kidney diseases, and diabetes.

The Effect of Comorbidity on Care and Cancer Survival Inequalities Study — known as the C3 (Quantitative) study — is one of two Cancer, Care and Comorbidity (C3) studies. This study aimed to investigate the impact of comorbidity and ethnicity on cancer care and outcomes in New Zealand. To do this, we identified a sample of 14,996 patients who had been diagnosed with one of nine cancers (bladder, breast, colon, kidney, liver, ovarian, rectal, stomach or uterine).

We used information from 1) the New Zealand Cancer Registry, 2) the administrative hospital discharge database (NMDS), 3) databases held by the main cancer treatment centres in New Zealand, and 4) the mortality database. For a subset of patients with rectal, stomach and liver cancer we also carried out a manual hospital notes review. From these sources, we collected information about the cancer (such as its extent at diagnosis), the patient (such as their age, sex, ethnicity and whether or not they had comorbidities), their cancer treatment (including surgical chemotherapy and radiotherapy) and their outcomes.


Cancer Control and Screening Research Group Wellington HRC Health Research Council of New Zealand
Improving cancer survival; and Reducing inequalities between Māori and non-Māori

C3: Effect of comorbidity on cancer and cancer survival inequalities (Quantitative study)

Community and clinical engagement

C3: Cancer care journeys and clinical decision-making (Qualitative study)

Intervention development
The ‘C3’ Studies: Cancer, Comorbidity and Care

MoH National Health Board

- Cancer Registry (n=14,096)
- Hospitalisation and other Databases
- Mortality Database

Notes Review (Upper GI & Rectal, n=718)

Study Cohort
- Ethnicity

Demographics
- Tumour Comorbidity
- Health Care

Survival
Measuring Comorbidity

1. No gold standard exists.

2. Measure depends on:
   1. Specificity vs generalisability requirements
   2. Data availability
   3. Resource availability
   4. Study questions

3. Recommendations:
   1. Administrative data (large populations)
   2. Inclusive of conditions
   3. More than one data source
The C3 Index: is a cancer-specific compilation of comorbid conditions, weighted according to their association with non-cancer death.

Sarfati, Gurney, et al. J Clin Epi. 2013 (font sizes = condition weights)
Two approaches to measuring comorbidity in cancer populations

**Hospitalisation data**
- for 5 years prior to diagnosis
- Identification of all important concurrent conditions that were likely to have an impact on function or length of life
- n=50 conditions
- C3 Index

**Pharmaceutical data**
- in year* prior to diagnosis
- Identification of all important concurrent conditions that were likely to have an impact on function or length of life
- n=19 conditions
- PBCI

*excl 3 months immediately prior


Comorbidity is **highly prevalent** among cancer patients...

...but prevalence **varies** by cancer type.
Hypertension (Primary)

Diabetes (Any)

COPD/Asthma

Cardiac Arrhythmia

Māori cancer patients tend to have a greater comorbidity burden.
Hypertension (Primary)

- Stomach
- Bladder
- Liver
- Breast
- Rectal
- Colon
- Uterine
- Combined Sites
- Kidney
- Ovarian

Crude Prevalence (%)

Non-Māori
Māori
Diabetes (Any)

- Kidney
- Uterine
- Stomach
- Colon
- Bladder
- Combined Sites
- Ovarian
- Rectal
- Liver
- Breast

Crude Prevalence (%)

Non-Māori
Māori
Hepatitis (Chronic Viral)

Liver
Combined Sites
Kidney
Stomach
Rectal
Ovarian
Colon
Breast
Uterine
Bladder

Crude Prevalence (%)

Non-Māori
Hepatitis (Chronic Viral)

- Liver
- Combined Sites
- Kidney
- Stomach
- Rectal
- Ovarian
- Colon
- Breast
- Uterine
- Bladder

Crude Prevalence (%)

- Non-Māori
- Māori
A high comorbidity burden increases likelihood of mortality...

...but the extent of this varies by cancer.
C3 Index Category

Adjusted* All-Cause Excess Mortality (%)

- **Breast**
- **Urological**
- **Colorectal**
- **Gynaecological**
- **Upper GI**

*For age, sex, site, stage
Upper GI – Stage I-III Surgery

Adjusted* Odds Ratio: 0.50 (0.24-1.02)

*For age, sex, site, ethnicity, deprivation
What is happening?

• Improving our evidence base
  – Propensity score analysis of CRC patients to assess impact of specific conditions on treatment and outcomes

• ‘De-siloing’ cancer care
  – Feasibility study to assess active identification and treatment of comorbidity in acute cancer setting

• Developing novel models of care
  – Pilot study of incorporating the Flinders model into acute cancer setting

• Skill development for clinicians
  – Development of clinical tools e.g. polypharmacy, life expectancy calculators

• Building research collaborations
  – NHMRC funded CoRE: Discovering Indigenous Strategies to improve Cancer Outcomes Via Engagement, Research Translation and Training (DISCOVER-TT); led from Queensland Institute of Medical Research.
  – Proposed CoRE on cancer and comorbidity led from Flinders University under consideration.
  – Across NZ collaborations developing for C3 ‘programme’ of work.
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Recent publications on cancer and comorbidity


http://annonc.oxfordjournals.org/content/early/2015/01/20/annonc.mdv025.full.pdf