

Different Needs or Treated Differently? Understanding Ethnic Inequalities in Coronary Revascularisation Rates



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Background

Several studies have reported major ethnic inequalities in cardiac revascularisation. This paper attempts to explain why in New Zealand, Māori and Pacific patients may be less likely to receive cardiac revascularisation interventions than Europeans.

Methods

Angiograms of 55 Māori, 45 Pacific and 100 age-sex matched European patients with ST elevation myocardial infarction were reviewed by two cardiologists blinded to the patients' ethnicity to determine ethnic differences in actual and recommended revascularisation likelihood.

Results

Māori and Pacific patients were 18% (95% C.I. 6%-29%) less likely to receive cardiac revascularisation procedures compared to European patients. If intervention had been based on the recommendation from blinded angiogram review they would have been 14% (2%-24%) less likely to receive revascularisation. Māori and Pacific were significantly more likely to be recommended for CABG (RR=2.9; C.I. 1.4-5.8) and less likely for PCI (RR=0.60; 0.48-0.75).

Māori and Pacific were at significantly higher risk of under-treatment overall (RR=5.0; 1.1-22.8) and for CABG (RR=8.0; 1.0-64.0), but not for PCI (RR=2.0; 0.2-22.1). However these relative risks became non-significant when cases not eligible for surgery due to comorbidities were excluded.

Conclusions

Māori and especially Pacific STEMI patients present with a pattern of ischaemic heart disease that is less amenable to PCI, even after allowing for differences in the number of diseased vessels and diabetes prevalence. The lower likelihood of Māori and Pacific patients receiving recommended CABG is largely explained by higher comorbidity prevalence.

Keywords

Māori • Pacific • Inequalities • Ethnic groups • Percutaneous Coronary Intervention • Coronary Artery Bypass Grafting

Introduction

In countries aspiring to equity in health outcomes, the existence of ethnic differences in cardiac revascularisation raises

concerns of institutional racism. Such ethnic inequalities are well documented in the United States, [1] but are absent in other countries with more egalitarian health systems such as the Netherlands. [2] In 2002 Tukuitonga and Bindman [3]

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showed that in New Zealand, Pacific and Māori ethnicity patients had much lower intervention rates for coronary artery revascularisation procedures in public hospitals than other ethnic groups, despite having much higher age-standardised mortality rates. Their analysis was based on data from 1990-1999.

More recent studies have shown that although these ethnic disparities in New Zealand have been reduced considerably, some inequalities persist. Kerr et al., analysing data from 2007-2012 in Counties Manukau District found that while Māori receiving angiography were as likely to get revascularisation as European/Others, they (and Pacific patients) were 5% less likely to get angiography. [4] In addition, Pacific patients were 13% less likely to be revascularised than European/Other.

Sandiford et al., on the other hand, examined intervention rates across the whole of New Zealand and when analysed using ST elevation myocardial infarction (STEMI) as a proxy for need, found that Māori men and women still have fewer PCI and total cardiac revascularisation procedures than expected based on their rate of STEMI than other non-Pacific ethnic groups.[5] Both studies noted that there are still conspicuous ethnic differences in the type of cardiac revascularisation received, with Pacific and Māori patients both less likely to receive PCI than other ethnicities and Pacific significantly more likely to receive CABG.

The difficulty in drawing conclusions from both of these studies lies in relating revascularisation to need. The use of overall STEMI rates as a proxy is rather crude and will not always reflect the consensus that revascularisation is appropriate within 12 hours of the onset of symptoms, or between 12 and 24 hours of the onset of symptoms where there is severe heart failure, persistent ischaemic symptoms, or the presence of haemodynamic/electrical instability. [6] A better way to assess the existence and extent of ethnic inequality in cardiac revascularisation would relate receipt of the procedure to need for it at the level of the individual patient. Specifically, ethnic differences in the need for revascularisation in patients diagnosed with STEMI who receive angioplasty, can be assessed by independent review of angiograms by expert cardiologists, blinded to the ethnicity of the patient.

Ethnic differences in recommended management (need) should reflect ethnic differences in the pattern of disease. If, for example, Māori and Pacific were more susceptible to diffuse multi-vessel disease which is less amenable to treatment by PCI, one might expect them to be more likely to need medical or CABG management. If so, then one would also expect that any ethnic difference in recommended treatment would be attenuated or eliminated after controlling for factors such as the prevalence of diffuse vessel disease as reflected in the number of vessels involved and the presence of diabetes. If observed ethnic differences in cardiac revascularisation rates do not reflect differences in need, it remains to be determined whether the difference is due to 'overtreatment' (in Europeans for example) or whether Māori and/or Pacific are being 'undertreated'; (or both).

This paper presents the findings of a blinded review of the management of 200 patients (55 Māori, 45 Pacific and 100 European) with STEMI diagnosis who received angiography. It attempts to determine whether observed ethnic differences in cardiac revascularisation are due to ethnic differences in need, or to differences in the willingness, ability or propensity to treat or be treated (on the part of the either clinicians or the patients).

Patients and Methods

Design

The study employed a retrospective matched cohort design comparing cardiac revascularisation probabilities in Māori and Pacific STEMI patients receiving angiography with European ethnicity controls matched by age group, sex, and the hospital where the angiogram was performed.

Eligibility Criteria

Index cases were identified from two large NZ District Health Boards' clinical databases (Auckland and Waitemata). All Waitemata domiciled Māori and Pacific patients aged 35 and over, discharged from North Shore, Waitakere or Auckland City Hospital between January 1st 2005 and December 31st 2009 with a diagnosis of transmural myocardial infarction (ICD 10 codes I21.0- I21.3) who also received a coronary angiogram, formed the index case group.^a

Outcome

Patients were classified according to whether they also received coronary revascularisation defined as PCI or CABG during or following the angiogram (and as a consequence of the procedure e.g. booked for CABG after the angiogram). If neither PCI nor CABG was received then the patient was classified as having no cardiac revascularisation (medical management). Cases that did not receive a revascularisation procedure after the index admission but did so following a later new acute event were not classified as having undergone revascularisation for the index admission. In addition, patient notes were reviewed to identify and reclassify the patients who had received PCI or CABG in private hospitals related to the index admission. Patient notes were reviewed to identify diabetes and other co-morbidities.

Exposure (Ethnicity)

Ethnicity was defined by the prioritised ethnicity code used in the National Minimum Data Set (NMDS). Patients with an 'unknown' ethnicity code were excluded from the analysis, however these comprise less than 2% of all discharges.

^aThe procedure codes used to define angiograms were: 3821500, 3821800-3821802. For angioplasty the following codes were used: 3530400-3530401, 3530500-3530501, 3531000-3531005, 3830000-3830001, 3830300-3830301, 3830600—3830605, 3831200. For CABG the codes were:3849700-3849707,

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