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ORIGINAL ARTICLE

Clinical Characteristics and Burden of Risk Factors Among Patients With Early Onset Acute Coronary Syndromes: The ANZACS-QI New Zealand National Cohort (ANZACS-QI 17)

Q1 Nikki J. Earle [a*], Katrina K. Poppe [a], Robert N. Doughty [a], Anna Rolleston [b], Andrew J. Kerr [c], Malcolm E. Legget [a]

Q2 [a]Department of Medicine, The University of Auckland, Auckland, New Zealand
Q3 [b]Department of General Practice and Primary Healthcare, The University of Auckland, Auckland, New Zealand
Q4 [c]Middlemore Hospital, Auckland, New Zealand

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Background Cardiovascular (CV) risk factor profiles of people experiencing acute coronary syndromes (ACS) vary with age, and in New Zealand (NZ), Māori and people of Pacific Island descent typically present with ACS at a younger age. We aimed to explore age- and ethnicity-related differences in CV risk factors in a large NZ cohort with first-time ACS.

Methods The All NZ Acute Coronary Syndrome Quality Improvement programme (ANZACS-QI) registry collects comprehensive data for patients admitted with ACS at NZ hospitals. This analysis includes patients with no prior atherosclerotic CV disease enrolled from 01/07/2012 to 30/06/2015.

Results 14,190 patients had confirmed ACS, 8493 (60%) patients with no prior CVD comprised the study cohort. The mean age was 64 years, 25% were aged <55 years, and 66% were male. Those aged <55 years were more likely than older patients to be current smokers (48% vs 19%), have higher body mass index (BMI) (48% vs 34% with BMI ≥ 30), and higher total cholesterol:HDL ratios (≥4.0, 70% vs 50%), all $p < 0.001$. Sixteen per cent of those <55 years had diabetes; these patients often had a BMI ≥ 30 (67%) and higher median HbA1c than older patients with diabetes (69 mmol/mol vs 55 mmol/mol). Māori and people of Pacific Island descent were overrepresented in the younger age group; these patients had a very high risk factor burden.

Conclusions A quarter of NZ patients admitted to hospital with a first-time CVD event are aged <55 years. Younger patients have a very high risk factor burden: half are current smokers, half have a BMI ≥ 30, and 16% have diabetes.

Keywords Premature coronary disease • Acute coronary syndromes • Cardiovascular risk factors

Q5 *Corresponding author at: Heart Foundation Research Fellow, Cardiovascular Research Group, Department of Medicine, University of Auckland, Private Bag 92019, Auckland 1142, New Zealand., Email: n.earle@auckland.ac.nz

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Introduction

Q6 The patterns of cardiovascular risk factors for people experiencing acute coronary syndromes (ACS) vary with age. There is no clear definition of the age at which coronary artery disease is defined as "early onset". Although subclinical coronary artery disease may be prevalent in people of younger ages, the reasons why disease progresses and manifests as an ACS in a subset of these individuals remain uncertain. Dyslipidaemia, a positive family history, smoking, and obesity are risk factors associated with ACS at a younger age, whereas a history of hypertension is more frequently reported in older patients [1–4]. The overall effects of the burden of modifiable cardiovascular risk factors has been shown to be stronger in younger individuals Q7 with ACS [5].

Disparities in outcomes related to cardiovascular disease (CVD) differ between ethnic groups in many countries, particularly for indigenous populations where outcomes tend to be less favourable [6–9]. In New Zealand (NZ), despite decreasing mortality rates, coronary artery disease is still a major cause of morbidity and mortality and there are disparities between outcomes for Māori, the indigenous population of NZ, and non-Māori, with Māori typically presenting with disease at a younger age. In 2011, Māori males had an age-standardised rate of ischaemic heart disease (IHD) deaths 1.7 times higher than non-Maori males, and the rate for Māori females was more than twice that of non-Māori females [10]. People of Pacific Island descent living in NZ also have high rates of IHD, being 1.7 times more likely to be diagnosed with IHD than non-Pacific New Zealanders [11].

The All NZ Acute Coronary Syndrome Quality Improvement programme (ANZACS-QI) is an electronic registry facilitating the collection of comprehensive risk factor and inpatient data for patients admitted with ACS at all NZ public hospitals. Implementation of the registry nationwide began in 2012 and was used in all public hospitals by November 2013. In addition to quality improvement initiatives, the registry provides a valuable resource for research.

The purpose of this manuscript is to describe the cardiovascular risk factor profile and burden of New Zealanders presenting with first-time ACS below the age of 55 years in the ANZACS-QI national cohort and to compare this with older patients, with the aim of improving the understanding of the demographics and risk factor exposure of patients with early onset ACS in a contemporary NZ cohort.

Material and Methods

The ANZACS-QI registry registers patients with suspected ACS in NZ hospitals, including all ST-elevation myocardial infarction (STEMI), non-STEMI and unstable angina [12]. The government-mandated minimum is that all ACS patients undergoing coronary angiography are registered; many hospitals also capture other ACS patients but comprehensiveness varies. The registry acts as a quality improvement initiative to track hospital adherence to guidelines and targets, collects data for research, and provides a framework for clinical studies which use the core dataset and the electronic framework. Ethical approval for the ANZACS-QI program has been obtained through the national Health and Disability ethics committee (MEC/07/19/EXP). All patient data are anonymised before being sent to researchers, thus individual patient consent is not required, although patients may request to opt out of inclusion in the cohort. The ANZACS-QI registry cohort is part of the Vascular Informatics using Epidemiology & the Web (VIEW) research programme which was approved by the Northern Region Ethics committee Y in 2003 (AKY/03/12/314) and by the national Multi-Region Ethics Committee in 2007 (MEC/01/19/EXP).

Patients admitted to a hospital for a confirmed ACS with no prior atherosclerotic CVD and entered into the ANZACS-QI registry between 1 July 2012 and 30 June 2015 were included in this analysis, incorporating data from 44 NZ hospitals. Where a patient had more than one ACS admission during this time period, only the first episode was included.

Myocardial infarction was defined as per the contemporary universal definition [13], and unstable angina was diagnosed if one of the following occurred in the absence of any biochemical evidence of myocardial necrosis: 1) Prolonged angina at rest, usually lasting ≥10 minutes; 2) New onset angina of at least Canadian Cardiovascular Society Class III severity; 3) Recent acceleration of angina to at least Canadian Cardiovascular Society Class III [14]. Prior atherosclerotic CVD was defined as prior diagnosis or history of angina, myocardial infarction, percutaneous coronary intervention, coronary artery bypass grafting, transient ischaemic attack or ischaemic stroke, peripheral vascular disease, or radiological evidence of vascular disease.

Statistical Analysis

Baseline characteristics were compared for patients aged <55 years and ≥55 years using the chi-squared or Fisher's exact test for categorical variables and the t-test or Wilcoxon rank sum test for continuous variables. Logistic regression was used to assess the relationship between ethnicity and early onset ACS, adjusted for key clinical factors. There is no standard age threshold to define early onset ACS, therefore 55 years was used, based on prior studies [15,16]. All analyses were carried out using R version 3.2.2 [17].

Results

Between 1 July 2012 and 30 June 2015, 14,190 patients with confirmed ACS were admitted to hospital and enrolled in the ANZACS-QI registry. There were 8493 patients without prior atherosclerotic CVD who comprised the study cohort. This cohort included 6294 (74%) European/Other, 978 (12%) Māori, 574 (7%) Pacific, 400 (5%) Indian, and 247 (3%) Asian patients (Table 1). Patients were predominantly male (66%) with a mean age of 64 years (range 19–99 years), and the most common discharge diagnosis was non-STEMI (58%), followed by STEMI (30%) and unstable angina (13%).

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