006. The Australian perspective on premature coronary artery disease: prevalence and risk factors
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Purpose

Cardiovascular disease (CVD) is the leading cause of morbidity and mortality in the world as reported by the World Health Organisation. CVD is a group of disorders encompassing Coronary Artery Disease (CAD), cerebrovascular disease and peripheral arterial disease. Shifting our attention to CAD, in 2012 CAD claimed the lives of over 20,000 Australians. Not only is the incidence of CAD on the rise, it is also estimated that about 4-10% of individuals with documented CAD are below the age of 45, referring to this phenomenon as Premature Coronary Artery Disease (PCAD).

Whilst there is a relatively good understanding of CAD in Australia, there is very limited amount of research conducted in the field of PCAD. The reported prevalence of PCAD ranges from 25% to 31% in other countries and as far as we know there is no study in Australia that elaborates on the prevalence of PCAD let alone the risk factors for PCAD. Furthermore, the true prevalence of PCAD is also believed to be underestimated as symptomatic CAD at a young age is relatively uncommon.

The primary outcome of this study was to gain a greater understanding of the prevalence and risk factors for PCAD. The secondary outcomes included the development of a prediction model that could be used to predict the outcome of the coronary angiogram based on an individual's risk factor profile. Furthermore, to also determine the factors that correlate to a normal coronary angiogram or in other words to determine the protective factors against PCAD.

Methods

Inclusion criteria: Patients who underwent coronary angiography at the Cairns Hospital between 1st of January, 2014 and 31st of December, 2016. The patients had to be equal to or less than the age of 50 at the time of the procedure.

Exclusion criteria: Patients were excluded from the study if they had multiple coronary angiograms conducted in the time frame (between 1st of January, 2014 and 31st of December, 2016). Only the first coronary angiogram done on a particular individual in the given time frame was included in the study.

Ethics: A National Ethical Application Form (NEAF) was applied to the Far North Queensland Human Research Ethics Committee (HREC). The HREC approval number is as follows: HREC/16/QCH/4-1022. Furthermore, a Public Health Act application (PHA) and Site Specific Application (SSA) was also completed and approved.

A total of 635 coronary angiograms were conducted at the Cairns Hospital between 1st of January, 2014 and 31st of December, 2016 on patients who were ≤ age of 50 at the time of the procedure. 82 cases were excluded from the study due to repeated angiograms during this time frame. A final number that was included in the study was 553 patients.

Demographic factors included in this study were age, gender and ethnicity. Clinical risk factors included were history of Diabetes Mellitus (DM), hypercholesterolemia, smoking, hypertension, family history of

CAD and Body Mass Index (BMI). The biochemical or laboratory risk factors that were included were blood glucose levels, red blood cell count, white blood cell count, neutrophil to lymphocyte ratio, haemoglobin and creatinine levels.

Results

We identified a high prevalence of 64% of PCAD amongst Australian patients undergoing coronary angiography at the Cairns Hospital. Half of the recruited individuals were of Aboriginal and/or Torres Strait Islander background. Furthermore, 57% of the individuals with PCAD in the study were of Aboriginal and/or Torres Strait Islander background. However as per the 2011 census only 9% of the population in the Cairns region was represented by people with an Aboriginal and/or Torres Strait Islander background.

We investigated for protective factors against PCAD and identified factors such as Increasing age (5 year intervals) (OR 0.67[0.55-0.81]. p0.000026), male gender (OR 0.40[0.25-0.65]. p0.00023), Aboriginal and/or Torres Strait Islander background (OR 0.49[0.29-0.81]. p0.005), hypercholesterolemia (OR 0.41[0.25-0.66]. p0.00027), smoking (OR 0.45[0.28-0.73]. p0.001), white cell count (OR 0.92[0.86-0.99]. p0.042) and blood glucose levels (OR 0.91[0.83-0.99]. p0.032) to be statistically significant after multivariate forward stepwise logistic regression.

Furthermore, we identified that when comparing the group with pathological coronary angiogram results with the group with normal coronary angiogram results there was a mean age difference of 2 years with the pathological group being 2 years older. Similarly, when comparing mean glucose levels within the two groups the pathological angiogram results group had a mean glucose level of 8.6mmol/L as compared to a lowly 6.7mmol/L in the normal results group. The pathological results group also had worse renal function with a mean creatinine level of 110umol/L as compared to 85umol/L in the normal angiogram group. Lastly, the mean neutrophil to lymphocyte ratio, a marker for systemic inflammation, was also higher in the pathological coronary angiogram results group, 8.6 as compared to 6.7 in the normal coronary angiogram results group.

Conclusions

We concluded that there is a high prevalence of PCAD within the Cairns region and also amongst the Australian Indigenous patients undergoing coronary angiography at the Cairns Hospital. Other strongly associated risk factors with PCAD include increasing age, male gender, hypercholesterolemia, smoking, white cell count and blood glucose levels.