Student: Anshuman Gupta

Title: Determining the Prevalence of Normal and Sub Aneurysmal Aortic Diameters in Patients Undergoing CT Colonography

Supervisor(s): Dr Manar Khashram and Professor Justin Roake

Sponsor: Pacific Radiology Group

Introduction:

Abdominal aortic aneurysm (AAA) is a dilatation of the main artery in the abdomen. It is the most common site of aneurysms in the body, affecting 5% of men aged between 65 and 75 years old. As the AAA grows with time, the risk of rupture increases. The chance of death from AAA rupture is greater than 80% compared to less than 5% chance of death if AAA is repaired electively. This highlights the importance of early detection and intervention to prevent rupture.

Internationally, seven countries have started national AAA screening programmes to reduce the chance of AAA rupture. However, a national AAA screening programme does not exist in New Zealand. One of the main reasons for this is the lack of AAA population prevalence studies.

Currently no evidence relating the size of the aorta to mortality in patients exists in NZ. Although standardized cutoffs of 2.5-2.9cm, greater than 3cm and 5.5cm define the presence a sub- aneurysmal aorta, presence of an AAA and those patients requiring intervention respectively.

Aim:

The objective of this study was to determine the relationship between aortic size and mortality in patients with normal, sub aneurysmal, and aneurysmal aortic diameters.

Method:

In this study a database of all patients who underwent CT colonography (CTC) from 2009-2013 in the Canterbury region was retrieved. CT scans of all individuals were reviewed and measurements of the aorta were recorded and measured across 5 points; supraceliac, suprarenal, infrarenal, mid aorta and aortic bifurcation. A survival analysis was performed to determine the relationship between 1) presence of AAA and mortality and 2) size of aorta and mortality.

Results:

The scans of 2,964 individuals were reviewed during the study period. The average age was 72 years old and 64% were females. The average aortic diameter at the 5 different points was 2.5cm at the supraceliac level, 2.13cm at the suprarenal level, 1.94cm at the infrarenal level, 1.91cm at the mid aortic level and 1.81cm at the bifurcation point. Of the 2694 patients, 3.3% had an AAA. In terms of cardiovascular risk factors, 15.5% had cardiovascular disease, 38.9% had a high blood pressure, 30.9% were smokers and 9.4% individuals had diabetes.

At 5 years follow up, 80% of people with a normal aorta were alive, 60% of people with sub aneurysmal aortas were alive and 50% of people with an AAA were alive.

Conclusion:

Our results suggest that patients with AAA have a decreased chance of surviving, and when this data was broken down into categorical aortic measurements, it was shown that those with larger aortic measurements had a decreased chance at survival compared to individuals with a normal aortic diameter. This has implications for targeting cardiovascular risk factors if an abnormal aortic size was found on imaging.