

## **Carotid artery and ischemic heart disease have a bimodal association with aortic diameter**

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### **Background**

The relationship between atherosclerosis and abdominal aortic diameter, particularly abdominal aortic aneurysm (AAA) is not well understood. Recent work has suggested that there is a poor correlation between systemic atherosclerosis, as assessed in the carotid and femoral arteries, and abdominal aortic diameter. This study was undertaken to determine if carotid artery intimal-medial thickness or carotid plaque show any correlation with infra-renal aortic diameter.

### **Methods**

A total of 1512 participants of the Otago Vascular Genetics Study were examined by duplex ultrasound to assess common carotid artery intimal medial thickness (cIMT), carotid bifurcation stenoses and infra-renal abdominal aortic diameters. Concurrent vascular disease and other vascular risk factors were assessed by questionnaire, plasma lipids and anthropomorphic measures. Gender specific aortic diameter tertiles or presence of AAA was compared with carotid artery measures and vascular risk factors using logistic regression.

### **Results**

A total of 77 (5.1%) AAA were detected (median size 34.1mm, IQR 30.4-45.2), which is consistent with that observed in similar elderly, predominantly male, Caucasian cohorts. The largest, non-aneurysmal, aortic size group (3<sup>rd</sup> tertile) had the lowest rates of carotid stenosis and ischemic heart disease. Using this group as the reference population, carotid stenosis, but not cIMT, was independently associated with both smaller aortic size groups and AAA. Carotid stenosis (>50%) had an adjusted odds ratio of 2.6 (95%CI 1.7-4.0,  $p<0.0001$ ) and 5.2 (2.6-10.5,  $p<0.0001$ ) in association with the lowest tertile for aortic size and AAA respectively. A similar relationship was observed between aortic diameter and ischemic heart disease.

### **Conclusion**

Small aortic size or presence of AAA are significant independent risk factors for other forms of atherosclerosis, such as carotid artery stenosis or ischemic heart disease.