THE EFFECT OF OBESITY ON AORTIC STIFFNESS IS AGE DEPENDANT

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doi:10.1136/heartjnl-2013-304019.107

Background Aortic pulse wave velocity (PWV), a measure of central arterial stiffness, is an independent predictor of cardiovascular and all-cause mortality and has been associated with numerous cardiovascular risk factors. However, data on the association between obesity and aortic stiffness have been mixed, with some studies showing a positive association, others a negative association and others apposing effects between the sexes.

Methods 221 adult volunteers (127 female, age range 18–72 years, mean 40.3 years) were recruited via advertisement. Exclusion criteria included a history of cardiovascular-related disease, including hypertension, hypercholesterolaemia or diabetes. Central PWV was measured in the thoracic aorta using MRI. Total body fat mass was measured with multi-frequency bioelectrical impedance analysis.

Results Multiple linear regression analyses showed that, when age, sex and systolic BP were adjusted for, higher body fat composition was associated with lower aortic PWV (p=0.004). These effects were similar for both men and women (p=0.60 for a sex by body composition interaction). Further analysis revealed a significant age by body fat interaction (p<0.001) such that, in young adults obesity predicted a lower PWV whereas in older adults obesity predicted higher PWV.

Conclusions These results show that the effect of obesity on aortic stiffness is age-dependent and are able to consolidate some previously inconsistent findings within the literature. These findings may reflect morphological and physiological differences in obesity at different ages.