



HAL
open science

Obesity has divergent effects on aortic stiffness in young and old adults

Ben Corden, Niall Keenan, Antonio de Marvao, Tim Dawes, Alain de Cesare, Tamara Diamond, Giuliana Durighel, Alun Hughes, Stuart Cook, Declan O'Regan

► To cite this version:

Ben Corden, Niall Keenan, Antonio de Marvao, Tim Dawes, Alain de Cesare, et al.. Obesity has divergent effects on aortic stiffness in young and old adults. *Journal of Cardiovascular Magnetic Resonance*, 2013, 15 (Suppl 1), pp.P229. inserm-00782657

HAL Id: inserm-00782657

<https://inserm.hal.science/inserm-00782657>

Submitted on 30 Jan 2013

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

POSTER PRESENTATION

Open Access

Obesity has divergent effects on aortic stiffness in young and old adults

Ben Corden^{1*}, Niall G Keenan², Antonio de Marvao¹, Tim Dawes¹, Alain De Cesare³, Tamara Diamond¹, Giuliana Durighel¹, Alun D Hughes⁴, Stuart A Cook¹, Declan P O'Regan¹

From 16th Annual SCMR Scientific Sessions
San Francisco, CA, USA. 31 January - 3 February 2013

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, hypercholesterolemia and diabetes. Aortic arch PWV was calculated from the three dimensional vessel length and the transit time between the flow waveforms in the ascending and descending aorta, assessed using Magnetic Resonance Imaging (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 blood pressure were adjusted for, higher body fat percentage 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 fat interaction). Further analysis revealed a significant age by body fat interaction ($p < 0.001$, see figure 1) such that, in young adults obesity predicted a lower PWV whereas in older adults obesity predicted a higher PWV.

Conclusions

The effect of obesity on aortic stiffness is age-dependant: in older adults being overweight predicts stiffer central arteries but in younger adults it predicts less stiff arteries. This finding helps explain the previously inconsistent findings within the literature and may relate to morphological and physiological differences between similar levels of obesity at different ages.

Funding

Medical Research Council.

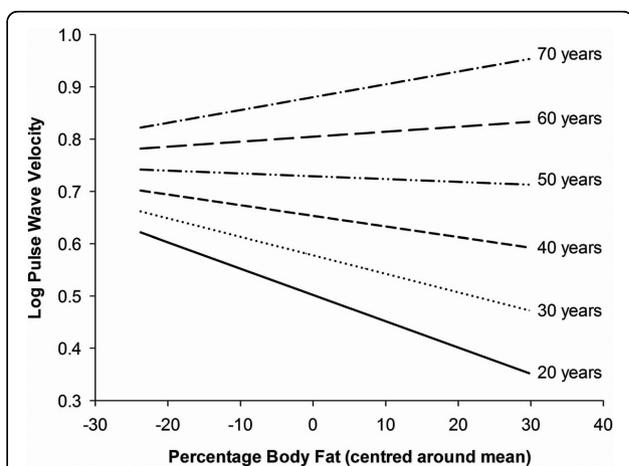


Figure 1 Simple plots illustrating the interaction between age and body fat. As age increases, body fat has an increasingly positive association with PWV. Each slope's gradient represents the effect size and direction of the relationship between body fat and aortic PWV for the age specified, with all co-variants held constant.

¹Robert Steiner MRI Unit, Imperial College London, London, UK
Full list of author information is available at the end of the article

Author details

¹Robert Steiner MRI Unit, Imperial College London, London, UK. ²Department of Cardiology, Imperial College London, London, UK. ³INSERM, Paris, France. ⁴International Centre for Circulatory Health, Imperial College London, London, UK.

Published: 30 January 2013

doi:10.1186/1532-429X-15-S1-P229

Cite this article as: Corden *et al.*: Obesity has divergent effects on aortic stiffness in young and old adults. *Journal of Cardiovascular Magnetic Resonance* 2013 **15**(Suppl 1):P229.

**Submit your next manuscript to BioMed Central
and take full advantage of:**

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at
www.biomedcentral.com/submit

