

Meeting abstract

Open Access

1046 Acute elevation of plasma free fatty acid levels reduces aortic distensibility

Oliver J Rider*, Yaso Emmanuel, Kieran Clarke and Stefan Neubauer

Address: University of Oxford, Oxford, UK

* Corresponding author

from 11th Annual SCMR Scientific Sessions
Los Angeles, CA, USA. 1–3 February 2008

Published: 22 October 2008

Journal of Cardiovascular Magnetic Resonance 2008, **10**(Suppl 1):A171 doi:10.1186/1532-429X-10-S1-A171

This abstract is available from: <http://jcmr-online.com/content/10/S1/A171>

© 2008 Rider et al; licensee BioMed Central Ltd.

Introduction

Decreased aortic distensibility (AD) is recognized in a range of different pathologies including hypertension, coronary artery disease, diabetes and obesity and has been proposed as an independent predictor of adverse outcomes. Studies in obesity show that the decrease in AD is most pronounced distally and is associated with elevated plasma free fatty acid (FFA) levels. Acute elevation of plasma FFA levels has been shown to reduce peripheral arterial compliance, but the effect on central AD in normal weight subjects is unknown. Our hypothesis was that elevations in plasma FFA levels would reduce AD in a pattern similar to that seen in obesity.

Methods

Seven subjects (3 male, 4 female) with no identifiable cardiac risk factors, underwent MR imaging of the aorta before and during intralipid infusion to acutely elevate serum FFA levels (after 1 h and 4 h). AD was assessed at three levels; the ascending (Ao) and proximal descending aorta (PDA) at the level of the pulmonary artery and the distal descending aorta (DDA).

Results

FFA levels were significantly elevated after four hours (0.33 ± 0.16 vs. 1.81 ± 0.71 mM, $p < 0.004$). There was no change in AD after one hour of intralipid infusion at any level of the aorta. (Ao 9.2 ± 3.0 vs. 8.5 ± 2.0 mm/Hg⁻¹ × 10⁻³; $p > 0.99$, PDA 7.5 ± 1.8 vs. 7.3 ± 2.0 mm/Hg⁻¹ × 10⁻³; $p > 0.99$, DDA 11.4 ± 2.3 vs. 10.3 ± 2.1 mm/Hg⁻¹ × 10⁻³; $p > 0.99$). However, after 4 hours of intralipid infusion, there was a 26% decrease in AD at the level of the abdominal

aorta. (DDA 8.4 ± 1.8 vs. 11.4 ± 2.3 mm/Hg⁻¹ × 10⁻³; $p < 0.05$). (Figure 1.)

Conclusion

During acute elevation of FFA, more distal aortic regions were associated with reductions in aortic distensibility, which did not reach significance in more proximal regions. This predominantly distal pattern of distensibility decrease is similar to that seen in obesity. Elevation of FFA is associated with oxidative stress and has been shown to impair endothelium-dependent relaxation in isolated rabbit aorta and human studies of leg blood flow in obese subjects using a similar infusion to our study. The observed aortic distensibility changes may be due to similar mechanisms.

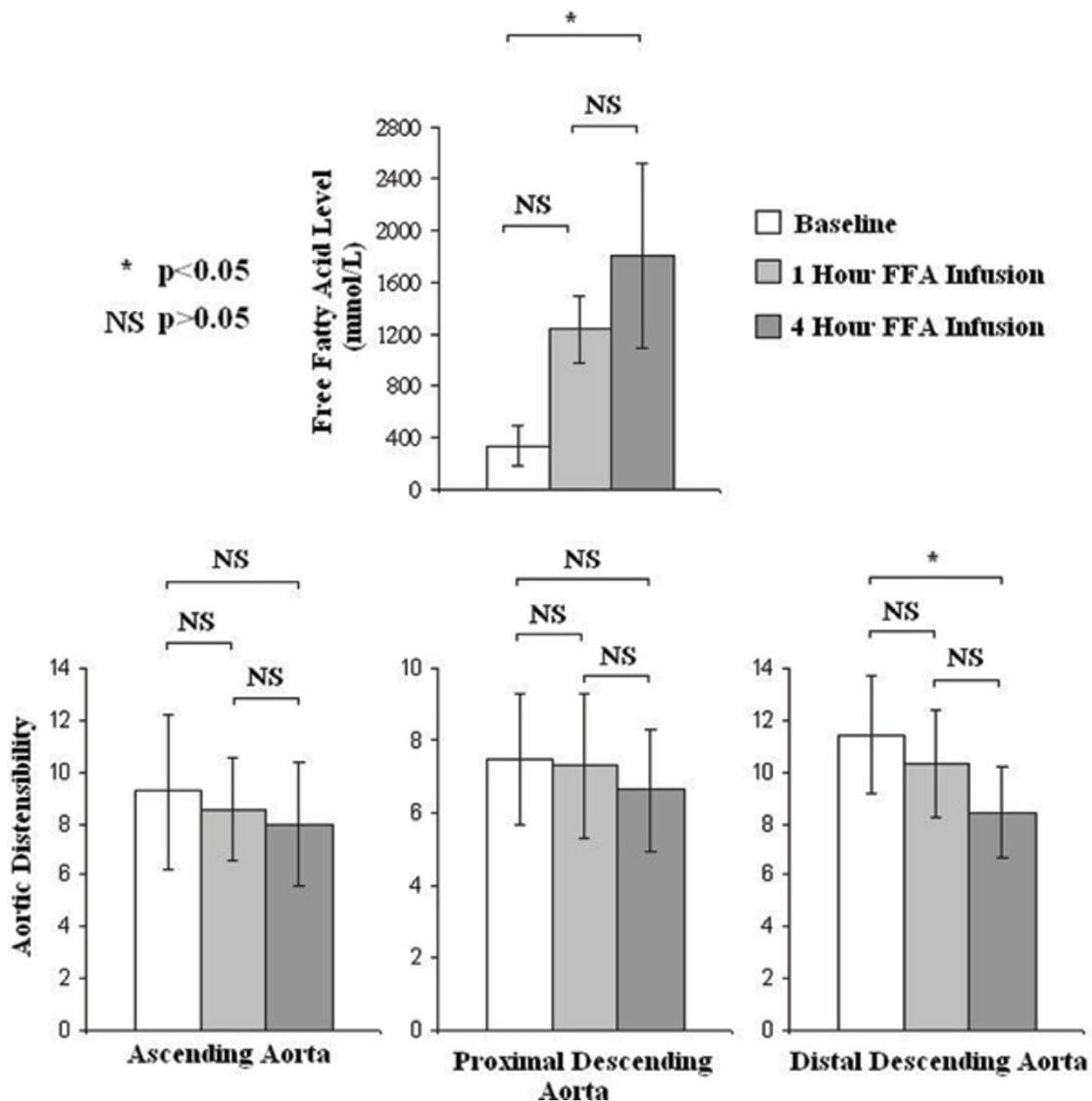


Figure 1
 During acute elevation of plasma free fatty acid levels, reductions in aortic distensibility were seen in distal aortic regions.

Publish with **BioMed Central** and every scientist can read your work free of charge

"BioMed Central will be the most significant development for disseminating the results of biomedical research in our lifetime."
 Sir Paul Nurse, Cancer Research UK

Your research papers will be:

- available free of charge to the entire biomedical community
- peer reviewed and published immediately upon acceptance
- cited in PubMed and archived on PubMed Central
- yours — you keep the copyright

Submit your manuscript here:
http://www.biomedcentral.com/info/publishing_adv.asp