Anti-MDA-LDL antibody levels indicate protection from coronary CT-derived valve calcification in the SCOT-HEART Trial

A. Hartley¹, M. Williams², M. Caga-Anan¹, A. Kaura¹, D. Dey³, M. Dweck², D. Newby², R. Khamis¹

¹Imperial College London, London, United Kingdom of Great Britain & Northern Ireland
²University of Edinburgh, Edinburgh, United Kingdom of Great Britain & Northern Ireland
³Cedars-Sinai Medical Center, Los Angeles, United States of America

Funding Acknowledgements: Type of funding sources: Public Institution(s). Main funding source(s): Wellcome Trust

Introduction: Coronary CT-derived valve calcification is becoming increasingly important in the multi-modality assessment of valvular disease, especially in aortic and mitral stenosis, where trans-catheter structural heart interventions may be indicated. Separately, natural antibodies targeted against malondialdehyde-modified LDL (MDA-LDL), an important subset of all oxidised low-density lipoproteins, are related to less coronary atherosclerosis and freedom from cardiovascular events.

Purpose: To investigate possible relationships between coronary CT-derived valve calcification and anti-MDA-LDL antibodies.

Methods: In a substudy of the multicentre randomised controlled SCOT-HEART trial (Scottish COmputed Tomography of the HEART), we investigated the association between manually assessed presence or absence of mitral and aortic valve calcification and IgM/ IgG anti-MDA-LDL antibodies. Serological biomarkers were measured using laboratory-developed enzyme-linked immunosorbent assays and assessed in tertiles versus imaging parameters, with adjustment for the ASSIGN cardiovascular risk score.

Results: In 830 patients (53% male, 57.6±9.8 years) with a heavy burden of cardiovascular risk factors (36% hypertension, 12% diabetes mellitus and 55% history of current or ex-smoking), the highest tertile of IgM anti-MDA-LDL related to a lower incidence of aortic valve calcification (odds ratio [95% confidence interval], 0.59 [0.36 – 0.96], p=0.04, p=0.07 for trend across tertiles) and mitral valve calcification (0.26 [0.07–0.72], p=0.02, p=0.05 for trend). There was also a trend for the highest tertile of IgG anti-MDA-LDL antibodies relating to a lower incidence of aortic valve calcification (0.36 [0.10–0.99], p=0.05, p=0.25 for trend), but not for mitral valve calcification.

Conclusions: Anti-MDA-LDL antibody levels were associated with a lower incidence of aortic and mitral valve calcification. Assessment of these novel biomarkers, which are known to relate to freedom from cardiovascular events, may be useful in screening patients prior to coronary CT for planning suitability for trans-catheter structural heart interventions.