Assessment of Residual Aortic Stiffness in AF: The Role of Central Haemodynamic Response to Exercise

Kashif Khokhar  
Dennis Lau  
Martin K Stiles  
Rajiv Mahajan  
Adrian Elliott  
Christian Verdicchio  
Ricardo Mishima  
Dian Munawar  
Celine Gallagher  
Kadhim Kadhim  
Prashanthan Sanders

Introduction: Increased arterial stiffness is an independent predictor of poor outcomes in atrial fibrillation (AF). The evaluation of central haemodynamic response to moderate exercise can help identify sub-clinical aortic stiffness in individuals with AF.

Methods: Objective: To study the response of central blood pressure indices to moderate exercise in patients with a history of AF. Method: The response of central blood pressure indices to moderate exercise was recorded in 46 consecutive patients with AF. Additionally, 31 subjects without a history of AF were recruited to act as controls. SphygmoCor XCEL (AtCor Medical, Australia) was used to characterise central and brachial blood pressure indices at rest and during early recovery after moderate exertion, quantified as achieving 80-85% target heart rate (HR) on Bruce protocol. The change in blood pressure indices were compared by linear regression model between the two groups. The analysis was further adjusted for age, gender, left atrial volume, heart rate and medications.

Result: The characteristics of the study cohort are listed (Table). The resting central systolic BP (CSBP) was better controlled in patients with history of AF (123±13 vs 128±13mmHg, p=0.006). However, the mean change in CSBP during exercise was comparable between the two groups (24+/-13 vs 21+/-13mmHg, p=NS). Further, patients with history of AF have exaggerated response of central augmentation pressure with a mean difference of 5.7mmHg (95%CI, 1 to 11.7, p=0.04) to exercise, illustrating reduced central arterial compliance.

Conclusion: Conclusion: Assessment of the central haemodynamic response to moderate exercise can help expose central arterial stiffness in patients with AF.