Lean Body Mass and Adiposity Increase the Risk of Atrial Fibrillation

Ricardo Sadashi Mishima
Dominik Linz
Dennis Lau
Kadhim Kadhim
Christopher Wong
Celine Gallagher
Mehrdad Emami
Melissa Middeldorp
Jeroen Hendricks
Prashanthan Sanders
Adrian Elliott

**Introduction**: Obesity increases the risk of atrial fibrillation (AF), although there is uncertainty regarding whether this risk is driven through elevated fat mass, lean body mass, or both.

**Methods**: Anthropometric measures were assessed amongst 492,132 UK Biobank participants aged 40-69 years. Body mass index was subsequently derived from height and body mass measures. Body composition analysis was performed using 8-electrode bi impedance analysis. Body fat percentage was directly assessed, with fat mass and lean body mass subsequently computed. Physical activity was assessed using a validated questionnaire. AF incidence was identified through linkage to electronic medical records covering hospital admissions, operative procedures and death reports.

**Result**: There were 12933 AF events over 6.9±1.2 year follow-up. All anthropometric measures were associated with AF risk with evidence of non-linearity for all variables. High lean mass, remained significantly associated with AF, following adjustment for measures of adiposity (HR for 1 SD above mean 1.37, 95% CI: 1.32-1.43). Conversely, fat mass was significantly associated with AF risk following adjustment for lean mass (HR for 1 SD above mean 1.16, 95% CI: 1.11-1.20). We noted a significant interaction between lean mass and physical activity on AF risk. Greater physical activity was associated with lower AF risk only in the lower ranges of lean mass.

**Conclusion**: Both lean and fat mass are associated with AF risk, with a greater contribution from lean mass. Physical activity is associated with lower AF risk only in participants across the lower ranges of lean body mass.