

Subclinical Changes in Cardiac Functional Parameters as Determined by Cardiovascular Magnetic Resonance (CMR) Imaging in Patients with Sleep Apnea and Snoring: Findings from UK Biobank

Thursday 11:50-12:00 PM | SSQ02-09 | Room: S404AB

PURPOSE

Obstructive sleep apnea (OSA) is a common disorder that shows an increased risk for left ventricular (LV) and, more rarely, right ventricular (RV) dysfunction. Most studies to date have examined populations with manifest cardiovascular disease and have used echocardiography to analyze ventricular dysfunction, with little or no reference to ventricular volumes or myocardial mass. We hypothesized that there would be stepwise increase in LV mass and RV volumes from the unaffected, to the snoring and the OSA group.

METHOD AND MATERIALS

We analyzed cardiac MRI data from 4493 UK Biobank participants free from cardiovascular disease. Participants were allocated into three cohorts: (i) with OSA; (ii) with self-reported snoring; and (iii) without OSA or snoring (n=38; 1919; and 2536 respectively). We determined ventricular volumes, ejection fraction and LV mass from balanced cine-SSFP sequences.

RESULTS

Trend analysis showed a stepwise increase for LV mass in both genders ($p < 0.001$) and for LV and RV ejection fraction (EF) and stroke volume (SV) as well as LV end diastolic volume in males ($p < 0.02$). There was no significant difference when comparing the OSA group to the unaffected group but we found a significant difference when comparing snoring to unaffected in LV mass of females ($\beta = 1.45 \pm 0.55\text{g}$; $p = 0.009$) and in LVEF and RVEF as well as LVSV and RV end systolic volume of males ($\beta = 0.80 \pm 0.28\%$; $p = 0.005$, $\beta = 1.17 \pm 0.28\%$; $p < 0.001$, $\beta = 1.68 \pm 0.76\text{ml}$; $p = 0.027$ and $\beta = -2.41 \pm 0.90\text{ml}$; $p = 0.008$) respectively.

CONCLUSION

Our study suggests that the transition from snoring to OSA is an evolving process which is associated with LV hypertrophy. The different results based on the gender in the pilot data point to a gender specific progression. Separate prospective studies are needed to further explore the direction of causality.

CLINICAL RELEVANCE/APPLICATION

Sleep apnea and snoring lead to gender specific alterations in cardiac function which may require diversified prevention and treatment strategies.