Abstract: P971

Association of sleep-disordered breathing severity with cardiac structural remodelling in patients with atrial fibrillation

Authors:
K Kadhim¹, D Jones², AD Elliott¹, M Middeldorp¹, J Hendriks¹, R Mahajan¹, RD Mcevoy³, D Lau¹, P Sanders¹, D Linz¹, ¹University of Adelaide, Centre for Heart Rhythm Disorders - Adelaide - Australia, ²University of Adelaide - Adelaide - Australia, ³Flinders Medical Centre and Flinders University, Adelaide

Topic(s):
Atrial Stressors Causing Atrial Fibrillation

Citation:

Background: Sleep-disordered breathing (SDB) is prevalent in patients with atrial fibrillation (AF). Patients with SDB experience more frequent and more severe episodes of AF, and the treatment of concomitant SDB in AF patients enhances the likelihood of maintaining sinus rhythm. Atrial structural remodelling is an integral part of AF substrate development. We sought to assess the association between SDB severity and structural and functional echocardiographic parameters in patients with AF.

Methods: Prospectively-collected registry data for 442 consecutive patients with AF and SDB were analysed. All patients underwent formal overnight polysomnography. SDB severity was classified using the apnoea-hypopnoea index (AHI) as follows: <5/hr, no SDB; 5-14/hr, mild SDB; =15/hr, moderate-to-severe SDB. Further, apnoeic episodes were classified as central or obstructive depending on chest wall movement and detected airflow. Contemporaneous echocardiographic data was recorded and included left atrial diameter (cm), bi-plane left atrial volume (cm³), left ventricular internal diameter in diastole (LVIDd), and ejection fraction (EF%).

Results: Mean age for the population was 60±11 years, mean CHADs2Vasc score was 1.8±1.2 and 69% were men. Paroxysmal AF was present in 61.8% of the population and 16.3% had previous AF ablation. Left atrial diameter was significantly increased as the severity of SDB increased: 3.8 [IQR: 3.4-4.3] cm for no SDB, 4 [IQR 3.6-4.3] cm for mild SDB and 4.2 [3.8-4.5] cm for moderate-to-severe SDB (p<0.001). Additionally, left atrial volume also increased as the severity of SDB increased: 61 [47-86] cm³, 63 [49-79.5] cm³ and 73 [56-91] cm³ for no, mild, and moderate-to-severe SDB respectively, p<0.001. There was no significant differences in left ventricular diameter (p=0.08) or EF% (p=0.5). AHI correlated significantly but modestly with left atrial diameter (r=0.2, p<0.001) and left atrial volume (r=0.13, p=0.008). Within the components of the AHI, each of total apnoea index, obstructive apnoea index and hypopnoea index had significant correlation with left atrial volume (p=0.01, 0.01 and 0.02 respectively) and left atrial diameter (p=0.01, 0.01 and <0.001, respectively). However, central apnoea index had no correlation with either measurements (p=0.28 for both).

Conclusion: SDB severity is associated with increased left atrial dimensions in patients with AF. Obstructive, but not central apnoeas contributed to this association. Whether pathophysiological processes mainly present in obstructive apnoeas, such as intrathoracic pressures swings, contribute to arrhythmogenic atrial structural remodelling in AF requires further study