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# ASSESSMENT OF LEFT VENTRICULAR STRUCTURE AND FUNCTION IN SLEEP APNOEA SYNDROME PATIENTS WITH ECHOCARDIOGRAPHY

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**Objectives** It is well known that sleep apnoea syndrome (SAS) is associated with various medical problems that have an impact on cardiovascular mortality and morbidity. But it is seldom reported that two-dimensional speckle tracking imaging (2D-STI) and real-time 3-dimensional echocardiography (RT-3DE) were used for cardiac assessment in patients with sleep apnoea syndrome (SAS). The aim of this study is to explore the left ventricular structural and functional abnormality by echocardiography in patients with SAS, and assess the applicability of RT-3DE for cardiac measurement in SAS.

**Methods** 35 SAS and 31 non-SAS adults were enrolled according to apnoea-hypopnea index (AHI). Left ventricular structure and function were assessed by echocardiography techniques. Left ventricular volumes and EF were measured by both two-dimensional echocardiography (2DE) and RT-3DE, left ventricular mass (LVM) by RT-3DE, left ventricular Tei index by Tissue Doppler imaging (TDI), and longitudinal strain by 2D-STI.

**Results** There was higher LVM in individuals with SAS than those without SAS ( $183.39 \pm 57.06$  vs  $153.96 \pm 32.89$ ,  $p=0.012$ ), and there were no significant differences in left ventricular volumes between two groups. The left ventricular Tei index was increased in SAS group compared with non-SAS group ( $0.48 \pm 0.10$  vs  $0.41 \pm 0.07$ ,  $p=0.003$ ). Left ventricular longitudinal strains of all segments were decreased in SAS group compared with non-SAS group, including basal anterolateral segment (BAL) ( $-17.50 \pm 4.87$  vs  $-21.24 \pm 3.87$ ,  $p=0.001$ ), mid anterolateral segment (MAL) ( $-18.55 \pm 4.78$  vs  $-21.97 \pm 3.85$ ,  $p=0.002$ ), apical lateral segment (ApL) ( $-19.60 \pm 4.81$  vs  $-22.97 \pm 3.86$ ,  $p=0.003$ ), basal interseptum segment (BIS) ( $-16.66 \pm 5.07$  vs  $-20.62 \pm 3.10$ ,  $p=0.001$ ), mid interseptum segment (MIS) ( $-17.41 \pm 4.95$  vs  $-21.17 \pm 3.94$ ,  $p=0.001$ ), apical septum segment (ApS) ( $-18.19 \pm 4.88$  vs  $-21.79 \pm 3.87$ ,  $p=0.002$ ), whereas the left ventricular EF had no significant difference between two groups. There were good correlations between 2DE

and RT-3DE for measurement of left ventricular end diastolic volume ((93.35±20.43) ml, (95.74±23.42) ml, respectively (r=0.866, p<0.001)), end systolic volume ((37.81±11.29) ml, (39.95±15.09) ml, respectively (r=0.783, p<0.001)), and EF ((59.93±5.09) %, (58.76±5.82)%, respectively (r=0.595, p<0.001)). And the two measurements consist well.

**Conclusions** SAS is associated with left ventricular structural and functional changes. Combined use of TDI, 2D-STI, and RT-3DE can detect early abnormality of left ventricular structure and function in patients with SAS. RT-3DE is feasible to evaluate LV structure and function in SAS due to its good correlation and consistence with 2DE, which may have important significance in patients with SAS.