Objectives  Little is known about ventricular function in OSHAS (obstructive sleep apnoea hypopnoea syndrome) patients without clinical symptoms of cardiovascular disease. The aims of this study was therefore to evaluate whether dobutamine stress 99mTc-tetrofosmin quantitative gated SPECT (QGS) could find early cardiovascular complications.

Methods  The study included 29 OSAHS patients and 10 normal subjects with the resting electrocardiogram and echocardiography unremarkable. 29 OSAS patients were classified into three groups according to their apnoea-hypopnea index (AHI). QGS was performed in all subjects at rest and during dobutamine infusion (20 μg/kg/min). The left ventricular ejection fraction (LVEF), peak ejection rate (PER), peak filling rate (PFR), 1/3 filling rate (1/3FR) and regional ejection fraction values were calculated for each subject.

Results  Compared with the control group in the dobutamine stress QGS, the LVEF (Left ventricular ejection fraction), PER (Peak ejection rate), 1/3FR (1/3 peak filling rate) and PFR (Peak filling rate) were significantly different (53.77±6.11 vs 61.61±5.42, 4.33±1.04 vs 7.34±1.14, 3.47±0.82 vs 5.90±1.23, 3.14±1.42 vs 6.12±1.24; p<0.001, <0.001, <0.0001, <0.0001, respectively) in the moderate group. And LVEF, PER, 1/3FR and PFR were also significantly different (48.76±5.51 vs 61.61±5.42, 3.10±0.88 vs 7.34±1.14, 2.33 ±0.69 vs 5.90±1.23, 2.57±1.35 vs 6.12±1.24; p<0.0001, <0.0001, <0.0001, <0.0001, respectively) in the severe group. Correlation analysis between parameters of cardiac function in the dobutamine stress QGS and indicators of PSG (polysomnography) showed that the parameters of cardiac function are negative correlation with AHI, Tmax (The longest time of apnoea), T <90% (the time of saturation lower than 90%) (p<0.01) and positive correlation with the SaO2min (lowest oxygen saturation at night) (p<0.01).

Conclusions  The positive rate of damaged cardiac function is more than 50% in the severe group compared with the normal control group by performing D-QGS. These findings indicate that D-QGS can be used to predict early cardiovascular complications in OSHAS patients with the resting electrocardiogram and echocardiography unremarkable.