Role of Tissue Doppler and Strain/Strain Rate Imaging in the Assessment of the Effects of Obesity on Left Ventricular Structure and Myocardial Systolic Function

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Aim: Obesity is a major contributor to the global burden of disease and disability. Objectives: Assessment of subclinical effects of obesity on left ventricular structure and systolic function by strain and strain rate tissue Doppler imaging. Patients and methods: Fifty obese patients with body mass index >30 kg/m² and without cardiovascular disease were included. Twenty five patients of this group were severely obese (BMI>35 kg/ m²) and another 25 were mildly obese (BMI 30-35 kg/m²). Another 50 age-and sex-matched healthy volunteers (BMI <25 kg/m²) were included as a control group. Conventional echodopplercardiography and tissue Doppler strain/strain rate imaging were done. Results: Obese persons have a larger LV mass and LV mass index and a significant direct correlation was found between body mass index and left ventricular mass index there was significant reduction in the mean systolic myocardial velocity in the obese group versus non obese groups. Mean systolic strain was significantly lower in the obese group versus non obese. Mean systolic strain rate was significantly lower in obese group versus non obese groups. Global longitudinal strain & average peak systolic strain rate was lower in obese versus non obese groups and a significant inverse relation was found between body mass index and the peak systolic velocity of strain and strain rate. Conclusions: strain and strain/rate tissue Doppler imaging can predict sub-clinical cardiac functional and structural changes in obesity.