TISSUE DOPPLER IMAGING, AS A SCREENING TOOL FOR SUBCLINICAL CARDIAC ABNORMALITIES IN OBESE ADOLESCENTS

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Objective: The objective of this study was to detect structural and functional early changes in the left and right ventricles in Egyptian obese adolescents.

Methods: Anthropometric, and echocardiographic parameters, using conventional and tissue Doppler imaging (TDI) were obtained in 70 obese adolescents their body mass index (BMI) (34 ± 3.8), compared with 50 age and sex matched controls their BMI (21.6 ± 1.9). Cardiac dimensions, stroke volume, left ventricular (LV) and right ventricular (RV) systolic and diastolic functions were evaluated.

Results: The obese group had higher end-diastolic septal and posterior wall thickness and LV mass index (LVMI), than non-obese. BMI, midarm and hip circumference values showed significant correlations with these echocardiographic variables ($p < 0.0001$). Systolic and diastolic functions of the LV were normal in both groups, although stroke volume was high the obese one. The RV tissue Doppler parameters were similar in both groups. However, S wave of septal/lateral tricuspid valve annulus was reduced in the obese group, but not to the level reflecting systolic dysfunction. This was inversely correlated with hip, waist and midarm circumference. Stepwise multiple regression analysis showed that the mid-arm and the hip circumference have significant impact on most of the echocardiographic measurements, while the BMI was not the predominantly significant parameter in the model.

Conclusion: Left ventricular hypertrophy is present in obese children although both systolic and diastolic functions are normal. TDI revealed a minor, but still significant, reduction in the RV systolic function. The mid-arm and hip circumferences and BMI are significant predictors of early cardiac abnormalities.