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Obese adolescents have heart damage

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Obese adolescents with no symptoms of heart disease already have heart damage, according to new research.

The findings were presented at the Heart Failure Congress 2012, 19-22 May, in Belgrade, Serbia. The Congress is the main annual meeting of the Heart Failure Association of the European Society of Cardiology.

Obesity is a risk factor for cardiovascular disease, and previous research has shown that obese adults have structural and functional changes to their hearts. The current study (abstract P843) investigated the relationship between body mass index (BMI) and cardiac function in overweight and obese adolescents with no symptoms of heart disease.

For the study, 97 healthy adolescents had their weight, height, waist circumference and hip circumference measured. BMI and waist/hip ratio were calculated. Blood and biochemistry tests and an echocardiogram were performed. Based on their BMI, patients were divided into three groups: lean (L=32 patients), overweight (Ov=33 patients) and obese (Ob=32 patients).

Several measures of heart size were made using information from the echocardiogram. Interventricular septal and left ventricular posterior wall thickness increased as BMI increased (L: 0.84+0.1 cm, Ov: 0.88+0.1 cm, Ob: 0.96+0.1cm, p=0.001; and L: 0.78+0.1 cm, Ov: 0.8+0.1 cm, Ob: 0.94+0.1cm, p=0.001, respectively).

Relative wall thickness and left ventricular mass index also increased in

parallel to BMI (L: 0.34+0.05, Ov: 0.34+0.05, Ob: 0.40+0.04, p=0.001; and L: 47.7+8.4 g/m2, Ov: 51.9+8.3 g/m2, Ob: 65.2+13.3 g/m2, p=0.001, respectively).

Measures of heart function were also performed. Left ventricular early diastolic lateral and septal velocities were reduced only in obese adolescents (L: 15.3+3.9cm/s, Ov: 13.6+4 cm/s, Ob: 10.5+3.4 cm/s, p=0.001; and L: 12.2+2.3 cm/s, Ov: 11.1+2.4 cm/s, Ob: 9.8+3.1 cm/s, p=0.003, respectively).

Systolic velocities were also only reduced in obese adolescents (L: 9.2+1.4cm/s, Ov: 9.3+2.3 cm/s, Ob: 8.04+1.5 cm/s, p = 0.018; and L: 9.05+2.3 cm/s, Ov: 9+2.4 cm/s, Ob: 7.6+1.1 cm/s, p=0.014, respectively).

Left ventricular lateral diastolic (r=-0.44, p=0.001) and systolic (r=-0.29, p=0.005) velocities correlated with BMI.

Obese adolescents with no symptoms of heart disease had damaged hearts with thicker walls. The systolic and diastolic function of their hearts was also impaired. Both structural and functional measures correlated with BMI. These findings may explain why obesity is a risk for heart disease.

"Education on healthy food and exercise is needed in schools to prevent obesity and early cardiovascular disease in adolescents," says lead author Professor Gani Bajraktari, professor of internal medicine and cardiology at the University of Pristina in Kosovo. "This is an important step in preventing obesity and cardiovascular disease in adults."

More studies are needed to show whether the heart damage in obese adolescents can be reversed if they lose weight.