Fat collections linked to decreased heart function

November 13 2009

Researchers from Boston University School of Medicine (BUSM) have shown that fat collection in different body locations, such as around the heart and the aorta and within the liver, are associated with certain decreased heart functions. The study, which appears on-line in *Obesity*, also found that measuring a person's body mass index (BMI) does not reliably predict the amount of undesired fat in and around these vital organs.

The prevalence of obesity is rising rapidly in the United States. Recent estimates suggest that approximately 30 percent of the adult population meets this criterion. Past studies have shown that fat accumulation in the liver and around the heart are linked to cardiovascular disease and type 2 diabetes.

BUSM researchers compared fat volumes in obese persons (BMI over 30), all of whom had high blood pressure and/or diabetes, and lean healthy persons (average BMI of 22). All subjects underwent magnetic resonance imaging (MRI) and proton MR spectroscopy to quantify pericardial and peri-aortic lipid volumes, cardiac function, aortic compliance and intra-hepatic lipid content. Fasting plasma lipoproteins, glucose, insulin, and free fatty acids were also measured among the subjects.

The researchers found fat collections in anatomically separate locations, such as within the liver and around the heart, to be associated to cardiovascular function - including a decrease in cardiac pumping

function - as fat around the heart increased. However, they also found that the amount of fat around the heart and aorta was not predicted by the BMI of the individual in this population.

"Our study found that fat collection around the heart, the aorta and within the liver is clearly associated with decreased heart functions and that an MRI can quickly and noninvasively measure fat volume in these areas. Our study also found that looking at BMI of the individual does not reliably predict the amount of undesired fat in and around organs," said James

Hamilton, PhD, senior author and project leader, and a professor of biophysics, physiology and biomedical engineering at BUSM.

According to the researchers, this method of measuring cardiac function and fat depots can be done in less than one hour, and may provide a basis for future individualized treatment.

Source: Boston University Medical Center