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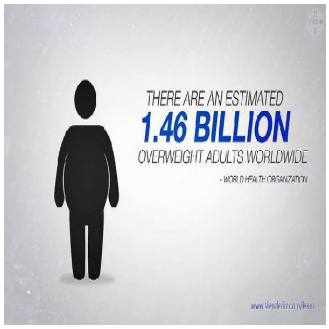
Study: Obesity Fuels Silent Heart Damage



New research has found that obese people without overt heart disease experience silent cardiac damage that fuels their risk for heart failure down the road. The findings, published in the *Journal of the American College of Cardiology: Heart Failure* , challenge the current belief that much of the cardiovascular disease amongst overweight people is caused by diabetes and hypertension, both well-known cardiac risk factors and both occurring frequently amongst the obese.

Using an ultrasensitive blood test to detect the presence of a protein that heralds heart muscle injury, researchers from Johns Hopkins and other institutions discovered that obese people had high levels of a heart enzyme known as troponin T, released by injured heart muscle cells. Increases in troponin T levels equated to increases in people's body mass index (BMI) — a measure of body fat based on a person's weight-to-height ratio. Levels of the enzyme rose proportionally as BMI went up.

Troponin T is the gold standard for diagnosing acute or recent heart attacks and is commonly used in emergency rooms to test patients with chest pain and other symptoms suggestive of a heart attack. The test used in the Johns Hopkins-led study works in much the same way, but is calibrated to detect troponin levels way below the ranges of the clinical test for diagnosing a heart attack.

For the study, the researchers measured the BMIs and troponin T levels of more than 9,500 heart disease-free men and women, aged 53 to 75, living in Maryland, Mississippi, North Carolina and Minnesota. The researchers then tracked the participants' health for more than 12 years. During the follow-up, 869 people developed heart failure. The researchers reported these key findings:

- Severely obese people (with a BMI above 35) had more than twice the risk of developing heart failure, compared with people of normal weight.
- That risk rose incrementally with BMI, growing by 32 percent for every five-unit increase in BMI. Thus, a 6-foot tall, 225-pound man with a BMI of 30 was 32 percent more likely to develop heart failure than a 6-foot tall, 188-pound man with a BMI of 25.
- All people with elevated troponin levels, regardless of BMI, had higher risk of developing heart failure over a decade. In other words, extra weight and high troponin each independently signalled higher heart disease risk.

"Obesity is a well-known 'accomplice' in the development of heart disease, but our findings suggest it may be a solo player that drives heart failure independently of other risk factors that are often found amongst those with excess weight," says lead investigator Chiadi Ndumele, MD, MHS, an assistant professor at the Johns Hopkins Ciccarone Center for the Prevention of Heart Disease.

When Ndumele's team evaluated the combined effects of elevated troponin and severe obesity, the predictive power was striking. Severely overweight people with elevated troponin levels were nine times more likely to develop heart failure than people with normal weight and undetectable troponin levels. The elevated risk persisted even after factoring in other possible causes of heart damage, including diabetes, hypertension and high cholesterol, the team noted.

"The direct relationship we found between obesity and subclinical heart damage is quite potent and truly concerning from a public health standpoint given the growing number of obese people in the United States and worldwide," Dr. Ndumele pointed out. Public health experts consider heart failure — a condition in which the heart muscle does not pump efficiently — a looming epidemic. The disease has been on a steady rise and is expected to affect one in five adults by 2030.

"These results are a wake-up call that obesity may further fuel the growing rate of heart failure, and clinicians who care for obese people should not be lulled into a false sense of security by the absence of traditional risk factors, such as high cholesterol, diabetes and hypertension," said Roger Blumenthal, MD, director of the Johns Hopkins Ciccarone Center for the Prevention of Heart Disease. "Obese people, even when free of cardiovascular symptoms, should be monitored for the earliest signs of heart failure and counselled on ways to improve their lifestyle habits."

According to the team, the next step is to study the precise mechanism by which obesity causes subclinical heart muscle damage, and whether reduction in weight would lower the risk for heart failure.

Other Johns Hopkins researchers involved in the study were Josef Coresh, Mariana Lazo and Elizabeth Selvin. Other institutions involved in the study included Baylor College of Medicine, the University of Minnesota, the Houston Methodist DeBakey Heart & Vascular Center, and the Michael E. DeBakey VA Medical Center in Houston.

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