RSNA Press Release

‘Beer Belly’ Linked to Heart Damage in Men

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At A Glance

- Abdominal obesity may be silently harming the heart, even in otherwise healthy people.
- Belly fat is linked to thickening of the heart muscle and smaller heart chamber volume, which can lead to heart failure.
- These associations are more common and more pronounced in men than in women.

CHICAGO – A large new study using advanced imaging found that abdominal obesity, sometimes referred to as a “beer belly,” is associated with more harmful changes in heart structure than overall body weight alone, especially in men. The findings, being presented this week at the annual meeting of the Radiological Society of North America (RSNA), also point to actions patients and doctors can take to identify potential risks and intervene earlier to protect the heart.

Jennifer Erley, M.D.

“Abdominal obesity, a high waist-to-hip ratio, is associated with more concerning cardiac remodeling patterns than high body mass index (BMI) alone,” said study lead author Jennifer Erley, M.D., radiology resident at University Medical Center Hamburg-Eppendorf, Germany. “It appears to lead to a potentially pathological form of cardiac remodeling, concentric hypertrophy, where the heart muscle thickens but the overall size of the heart doesn’t increase, leading to smaller cardiac volumes. In fact, the inner chambers become smaller, so the heart holds and pumps less blood. This pattern impairs the heart’s ability to relax properly, which eventually can lead to heart failure.”

Taking into account BMI, a measure of general obesity calculated from a person’s weight and height, and waist-to-hip ratio (WHR), a measure of abdominal obesity, the researchers studied cardiovascular MRI images of 2,244 adults aged 46 to 78 (43% female) without known cardiovascular disease. Abdominal obesity reflects an accumulation of visceral fat, which is stored deep around internal organs and strongly linked to harmful cardiovascular effects. All of the study participants are part of the ongoing Hamburg City Health Study, a long-term population study in Germany.

According to BMI, 69% of males and 56% of females in the study were overweight or obese. Using WHR, 91% of the males and 64% of females met the World Health Organization (WHO) criteria for obesity.

General obesity based on BMI was more often linked to enlarged heart chambers across all participants. Abdominal obesity

was associated with thickening of the heart muscle and smaller heart chamber volumes. These changes were more prominent in men, particularly in the right ventricle, which pumps blood to the lungs. This may reflect early cardiac stress on the heart related to how abdominal fat affects breathing and lung pressure.

Obesity also was linked to subtle heart tissue changes in men, detectable only with advanced cardiac MRI, potentially signaling early heart stress before symptoms or diagnosable disease. These associations persisted even after accounting for other cardiovascular risk factors, including arterial hypertension, smoking, diabetes and cholesterol.

“The sex-specific differences suggest that male patients may be more vulnerable to the structural effects of obesity on the heart, a finding not widely reported in earlier studies,” Dr. Erley said. “Rather than focusing on reducing overall weight, middle-aged adults should focus on preventing abdominal fat accumulation through regular exercise, a balanced diet and timely medical intervention, if necessary.”

The more extensive heart damage seen in men could be due to an earlier onset of more severe abdominal obesity, or the cardioprotective effect of estrogen in women, Dr. Erley said, though more research is needed.

With a tape measure, anyone can calculate their WHR at home by dividing their waist circumference at its narrowest point by their hip circumference at its widest point. A ratio above 0.90 for men and 0.85 for women is an indicator of abdominal obesity and is associated with increased risk of cardiovascular disease, according to the WHO.

The authors also encourage clinicians to be proactive in checking and flagging abdominal obesity early on to improve health outcomes.

“From the perspective of a radiologist, when we see this cardiac remodeling pattern, we currently think of cardiomyopathy, hypertensive heart disease or some other form of disease, but we don’t clinically draw the line to obesity in our reports,” Dr. Erley said. “This study should alert radiologists and cardiologists to be more aware that this remodeling could be attributed independently to obesity.”

Co-authors are Jonas H. Lund, M.D., Isabel Molwitz, M.D., Ersin Cavus, M.D., Gerhard B. Adam, M.D., Peter Bannas, M.D., Enver G. Tahir, M.D., and Mathias Meyer M.D.

Note: Copies of RSNA 2025 news releases and electronic images will be available online at *RSNA.org/press25*.

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For patient-friendly information on cardiac MRI, visit *RadiologyInfo.org*.

Video (MP4):

B-Roll
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Video. Jennifer Erley, M.D., discusses her research on abdominal obesity being associated with more harmful changes in heart structure than overall body weight alone, especially in men.
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Images (JPG, TIF):

Jennifer Erley, M.D., presenting her research at RSNA 2025.

Infographic

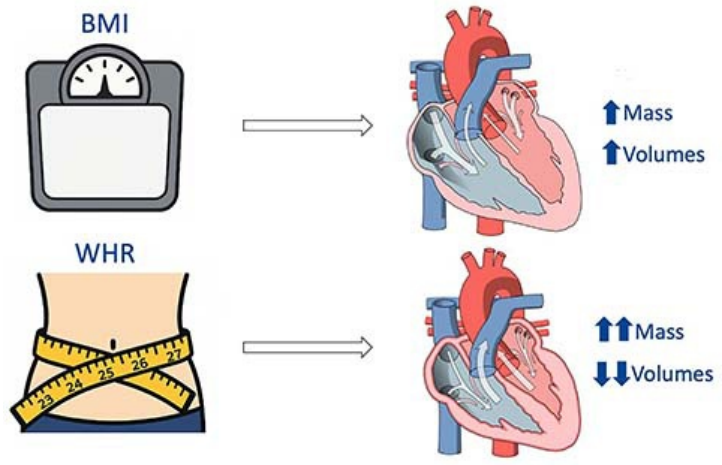

Figure 1. Pictogram showing the results of the research. An increase in waist-to-hip ratio (WHR) is associated with a higher left ventricular (LV) mass and lower ventricular volumes. Its association with right ventricular (RV) volumes is weaker in women than in men. An increase in body mass index (BMI) is associated with ventricular dilatation and a higher LV mass, although this relationship is also weaker in women.

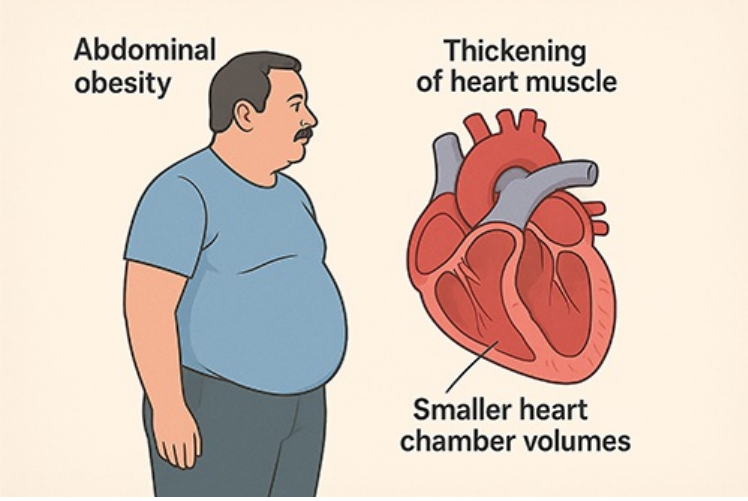

Figure 2. AI-generated illustration

Resources:

Abstract