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# Obesity, larger waist size associated with better outcomes in heart failure patients

July 3 2012

A slim waist and normal weight are usually associated with better health outcomes, but that's not always the case with heart failure patients, according to a new UCLA study.

Researchers found that in both men and women with advanced heart failure, obesity — as indicated by a high body mass index (BMI) — and a higher waist circumference were factors that put them at significantly less risk for adverse outcomes.

The study findings are published in the July 1 online issue of the *American Journal of Cardiology*.

Heart failure affects 5.8 million people, including 2.5 million women. Approximately one-half to two-thirds of heart failure patients are overweight or obese.

Women and men are known to have differences in body composition and body-fat distribution, and this study is one of the first to specifically assess the impact of BMI and waist circumference on women and compare it with men.

The findings also offer further insight into an observed phenomenon in chronic heart failure known as the "obesity paradox": Obesity is a known risk factor for developing heart disease and heart failure, but once heart failure has manifested, being overweight may provide some protective benefits.

"The study provides us with more insight about how both genders of heart failure patients may be impacted by the obesity paradox," said senior author Dr. Tamara Horwich, an assistant professor of cardiology at the David Geffen School of Medicine at UCLA. "Heart failure may prove to be one of the few health conditions where extra weight may prove to be protective."

For the study, researchers analyzed data on advanced heart failure patients treated at UCLA Medical Center from 1983 to 2011. The team assessed 2,718 patients who had their BMI measured at the beginning of heart failure treatment and 469 patients who had their waist circumference measured at the beginning of treatment.

Using standardized measures, the researchers identified men or women as having a high BMI if they were greater or equal to 25 $kg/m^2$ — this included both overweight patients (25 to 29.9 $kg/m^2$) and obese patients (30 $kg/m^2$ or greater).

For men, a high waist circumference was considered 40 inches (102 cm) or greater, and for women, 37 inches (88 cm) or greater. This assessment also included patients who were either overweight or obese.

At the two-year follow-up, researchers used statistical analysis and found that in men, a high waist circumference and high BMI were associated with event-free survival from adverse outcomes like death, the need for a heart transplant, or the need for ventricular assist device placement.

Women with a higher BMI also had better outcomes than their normal-weight counterparts, and women with a high waist circumference also trended toward improved outcomes.

Both men and women with a normal BMI and waist circumference were at a substantially higher risk for these adverse outcomes. In fact, a

normal BMI was associated with significantly worse outcomes — a 34 percent higher risk in men and a 38 percent higher risk in women —than a high BMI.

Normal waist circumference was also associated with an increased risk of adverse outcomes in both genders, with men's risk doubling and women's risk tripling.

"We knew that obesity might provide a protective benefit for heart failure patients, but we didn't know whether this obesity paradox applied specifically to women with heart failure, as well as men — and it does," Horwich said.

BMI measurement has been used for years as a surrogate measure of body fat. Since it measures all mass — including lean muscle, which weighs more than fat — the measurement may not be specific for total body fat. Waist circumference is a newer addition that may provide a more direct connection to body fat, since it measures the fat accumulated around the belly.

"The study also demonstrates how BMI and waist circumference can be used together to provide a more accurate measure of fat in the body to help determine obesity and assess risk," said the study's first author, Adrienne L. Clark, a resident in the department of medicine at the Geffen School of Medicine.

According to Horwich, no one knows exactly why the obesity paradox exists for heart failure patients, but there are several possible explanations.

Being underweight is traditionally associated with a poorer prognosis in heart failure patients. Obesity may be at the other end of the spectrum, and patients may thereby benefit from increased muscle mass, as well as

metabolic reserves in the form of fatty tissue. In addition, increased levels of serum lipoproteins that are associated with increased body fat may play an anti-inflammatory role, neutralizing circulating toxins and inflammation-related proteins.

Obese patients also present at an earlier stage of heart failure due to increased symptoms and functional impairment caused by excess body weight, so they may be getting help sooner, which also could improve outcomes, the researchers said.

The next steps in research will include larger studies with longer follow-up times, as well as a closer look at the physiology behind the obesity paradox.

**More information:** The study was funded by the National Heart, Lung and Blood Institute, part of the National Institutes of Health (grant 1K23HL085097).

Provided by University of California, Los Angeles