

New research links social stress to harmful fat deposits, heart disease

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A new study done by researchers at Wake Forest University School of Medicine shows that social stress could be an important precursor to heart disease by causing the body to deposit more fat in the abdominal cavity, speeding the harmful buildup of plaque in blood vessels, a stepping stone to the number one cause of death in the world.

The findings could be an important consideration in the way the United States and other Western countries try to stem the rapid rise of obesity, said Carol A. Shively, Ph.D., a professor of pathology and the study's principal investigator.

The study appears as the cover story of the current issue of *Obesity*, the peer-reviewed journal of the Obesity Society.

"We are in the midst of an obesity epidemic," Shively said. "Much of the excess fat in many people who are overweight is located in the abdomen, and that fat behaves differently than fat in other locations. If there's too much, it can have far more harmful effects on health than fat located in other areas."

She notes that [obesity](#) is directly related to lower [socioeconomic status](#) in Western societies, as is heart disease. So, the people who have fewer resources to buffer themselves from the stresses of life are more likely to experience such health problems, she said.

In this study of how the stress of low social status affects the

development of heart disease, female monkeys were fed a Western-style diet containing fat and cholesterol. The monkeys were housed in groups so they would naturally establish a pecking order from dominant to subordinate. Subordinate monkeys are often the target of aggression and aren't included in group grooming sessions as often as dominant monkeys.

Shively and colleagues Thomas C. Register, Ph.D., and Thomas B. Clarkson, D.V.M., all faculty of the Department of Pathology, Section on Comparative Medicine at the School of Medicine, found that these socially stressed subordinate monkeys developed more fat in the viscera, or abdominal cavity.

The researchers found that the stress of social subordination results in the release of stress hormones that promote the deposition of fat in the viscera. Visceral fat, in turn, promotes coronary artery atherosclerosis, the buildup of plaque in the blood vessels that leads to heart disease, the leading cause of death in the world today.

What is striking about that relationship, Shively said, is that women and female monkeys have a natural protection against heart disease - women typically develop heart disease, on average, 10 years later than men do. That protection seems to be lost when stress and visceral fat increase. Researchers found that the monkeys with high [social stress](#) and larger amounts of visceral [fat](#) also had ovaries that produced fewer protective hormones.

"Suppressed ovarian function is a very serious condition in a woman," Shively said. "Women who are hormone-deficient will develop more atherosclerosis and be at greater risk of developing coronary [heart disease](#) and other diseases such as osteoporosis and cognitive impairment."

Women whose bodies are not producing adequate amounts of hormones won't necessarily know it, Shively said. The researchers found that low hormone production doesn't always lead to fewer menstrual cycles. To diagnose serious health problems in obese women, doctors would have to investigate hormone levels.

"We need to take a closer look at the ovarian function of obese women," Shively said. "They might not be producing enough hormones to maintain adequate health."

The study's results also reinforce basic health advice, she said: watch what you eat, exercise regularly, and try to manage the stress in your life.

Source: Wake Forest University Baptist Medical Center ([news](#) : [web](#))

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