Overweight male teens with normal blood pressures showing signs of heart damage

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This is MCG Endocrinology Fellow Dayal D. Raja. Credit: Medical College of Georgia

Even while their blood pressures are still normal, overweight male teens may have elevated levels of a hormone known to increase pressures as well as early signs of heart damage, researchers say.

Medical College of Georgia researchers looking at 126 healthy 15-to17-year-olds in high school in Augusta, Ga., found the hormone aldosterone highest among the overweight males. Early intervention could help these young people avoid growing up to be adults with cardiovascular disease, the number one killer in the United States.

"These associations give us reason to question whether we should be

screening for and treating high aldosterone in obese males with normal pressures, particularly those with a family history of cardiovascular disease," MCG Endocrinology Fellow Dayal D. Raja says of the collaborative study with the Department of Pediatrics.

"Our failure to halt the progression of heart damage is attributed to late detection, because early heart damage is usually asymptomatic," Dr. Raja says. "We have evidence that we could identify individuals early and stop or even reverse that damage. We need more study to confirm our findings and a plan for whom and how to screen."

This first evidence of elevated aldosterone levels and early heart damage in a pediatric population with normal blood pressure earned Dr. Raja first place in the poster session at the recent American Association of Clinical Endocrinologists 18th Annual Meeting and Clinical Congress in Houston.

Aldosterone, a hormone produced by the adrenal gland, is known to increase blood pressure by increasing sodium and water retention. Despite normal blood pressures, the overweight males had thickened heart walls and an increase in the size of the pumping chamber of the heart, Dr. Raja says. Structural changes in the young hearts can be linked to a lesser-known aldosterone fact: it also promotes inflammation and formation of fibrous tissue in the heart muscle.

Overweight females in the group did not have elevated aldosterone levels or the associated heart damage, Dr. Raja says, noting that estrogen's cardioprotective effect may have made the difference.

Blood and urine test are available to measure aldosterone levels, but they typically aren't measured unless a patient on multiple medications still has uncontrolled blood pressure. By then, Dr. Raja says, significant cardiovascular damage may have been done.

It's more likely, young, overweight people would be told to lose weight, but that isn't working for most, Dr. Raja says. "We are trying weight loss but we are failing miserably," he says, noting the worldwide obesity epidemic. In fact, since that's today's standard, losing weight is just what these researchers told their study participants to do. Losing weight - if it happens - will decrease aldosterone levels.

Although the exact relationship between increased fat and increased aldosterone is still being sorted out, the latest research suggests that fat cells stimulate the adrenal glands to make more aldosterone, says Dr. Gregory Harshfield, director of MCG's Georgia Prevention Institute and a hypertension researcher.

As a follow up to Dr. Raja's study, Dr. Harshfield wants to block aldosterone levels in overweight teens with a family history of cardiovascular disease to determine if it can prevent or reverse dangerous heart changes and forestall hypertension. The GPI already is doing similar studies blocking the kidney's production of the powerful blood vessel constrictor angiotensin in young people with an impaired ability to secrete sodium.

The landmark 1999 RALE trial illustrated the potential benefit of reducing aldosterone levels even in people already suffering from heart failure. The study of 1,663 patients was halted early because of significantly reduced death rates in those taking the aldosterone-lowering, anti-hypertensive spironolactone. Patients on other anti-hypertensives failed to show as impressive results.

Source: Medical College of Georgia