Stress hormone, depression trigger obesity in girls

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(PhysOrg.com) -- Depression raises stress hormone levels in adolescent boys and girls but may lead to obesity only in girls, according to researchers. Early treatment of depression could help reduce stress and control obesity -- a major health issue.

"This is the first time cortisol reactivity has been identified as a mediator between depressed mood and obesity in girls," said Elizabeth J. Susman, the Jean Phillips Shibley professor of biobehavioral health at Penn State. "We really haven't seen this connection in kids before, but it tells us that there are biological risk factors that are similar for obesity and depression."

Cortisol, a hormone, regulates various metabolic functions in the body and is released as a reaction to stress. Researchers have long known that depression and cortisol are related to obesity, but they had not figured out the exact biological mechanism.

Although it is not clear why high cortisol reactions translate into obesity only for girls, scientists believe it may be due to physiological and behavioral differences -- estrogen release and stress eating in girls -- in the way the two genders cope with anxiety.

"The implications are to start treating depression early because we know that depression, cortisol and obesity are related in adults," said Susman.

If depression were to be treated earlier, she noted, it could help reduce

the level of cortisol, and thereby help reduce obesity.

"We know stress is a critical factor in many mental and physical health problems," said Susman. "We are putting together the biology of stress, emotions and a clinical disorder to better understand a major public health problem."

Susman and her colleagues Lorah D. Dorn, professor of pediatrics, Cincinnati Children's Hospital Medical Center, and Samantha Dockray, postdoctoral fellow, University College London, used a child behavior checklist to assess 111 boys and girls ages 8 to 13 for symptoms of depression. Next they measured the children's obesity and the level of cortisol in their saliva before and after various stress tests.

"We had the children tell a story, make up a story and do a mental arithmetic test," said Susman. "The children were also told that judges would evaluate the test results with those of other children."

Statistical analyses of the data suggest that depression is associated with spikes in cortisol levels for boys and girls after the stress tests, but higher cortisol reactions to stress are associated with obesity only in girls. The team reported its findings in a recent issue of the *Journal of Adolescent Health*.

"In these children, it was mainly the peak in cortisol that was related to obesity," Susman explained. "It was how they reacted to an immediate stress."

Provided by Pennsylvania State University

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