Medical Xpress

Where college students live can impact their weight, eating and exercise habits

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Endometriosis is a poorly understood condition that incapacitates and affects the productivity and lifestyle of millions of women around the world. In the US, it affects approximately six million women and adolescents at a cost of some $1.6 billion per year. It is a chronic painful disease which occurs when endometrial tissue grows as lesions outside the uterus, mainly in the area of the ovaries and fallopian tubes, but can also affect the intestinal tract. The condition results in chronic pelvic pain, painful menstrual periods and pain during intercourse.

Many patients report suffering from high levels of stress due to the impact that painful symptoms have on all aspects of their life, including work, family and personal relationships. For example, the physical pain they experience during intercourse can disrupt a healthy sexual relationship, thus causing anguish and discord which leads to further stress.

Circumstantial evidence suggests that a variety of stress management techniques can help women handle stressful situations related to the disease. However, it is not yet known whether stress affects the prevalence or progression of the disease.

A new study investigating the relationship between stress and the painful symptoms of the disease is currently underway. It offers, for the first time, evidence of the negative consequences of stress in the progression of endometriosis, most likely through an effect on the immune system.

The study was conducted by an interdisciplinary team of investigators with expertise in endometriosis, animal physiology and behavior. Marielly Cuevas, Olga I. Santiago, Kenira J. Thompson and Caroline B. Appleyard, Department of Physiology and Pharmacology, Ponce School of Medicine, Ponce, Puerto Rico, and Idhaliz Flores of the Department of Microbiology. Dr. Appleyard and her graduate student, Marielly Cuevas, will present the team's findings, entitled The Pathophysiology of Intestinal Endometriosis is Exacerbated by Uncontrollable Stress during the 121st annual meeting of The American Physiological Society, part of the Experimental Biology 2008 scientific conference.

Seven female rats were induced with endometriosis. Of the total, half were subjected to stressful swim tests for ten consecutive days, a chronic and stressful situation the animals could not control. The "endo-stress" group (n=3) was subjected to the swim trials. The "endo-control" rats (n=4) had endometriosis but did not swim. The sham-stress group (n=3) did not have the disease nor did they swim.

Sixty days after the induction of the endometriosis the rats were sacrificed and examined for the presence of endometriotic vesicles (small structures inside cells used to transport liquids such as proteins), and damage to the adjacent organs (including the colon and small intestine). The presence of the enzyme myeloperoxidase (MPO), which is linked to inflammation, was also assayed.

The researchers found that:

-- none of the sham-stress animals developed vesicles.

-- the endo-control group developed a total vesicle length that averaged 6.57±0.96mm per animal.

-- the endo-stress group developed a total vesicle length that averaged

11.26±5.27mm per animal.

-- the endo-control rats had higher colonic damage scores than sham-stressed animals, which was increased further by stress.

-- the endo-stress rats had the shortest colon length, the highest levels of MPO, the greatest number of colonic mast cells, and an increase in peritoneal fluid immune cell infiltration, all indicative of activation of inflammatory mechanisms.

According to the senior researcher for the study, Dr. Appleyard, “These findings contribute to our understanding of how stress may affect the severity of endometriosis. We think there is likely a connection with the immune system because of the observed levels of mast cells in the colon and the increased levels of inflammatory cells in the peritoneum of the affected rats, since this has also been observed in patients with endometriosis.” Appleyard continued, “The results offer a jumping off point to help identify stress-management interventions that will help those women who are affected by the disease.”

Source: American Physiological Society

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