

Fit rats can stomach menopause

Women enter menopause when their ovaries stop making the hormone estrogen. The longer a woman is postmenopausal (without estrogen), the more likely she is to gain weight and fat storage moves from the hips and thighs to the belly. This belly fat can increase the risk of postmenopausal women developing type 2 diabetes and diseases of the heart and blood vessels. Recent studies have shown that the bacteria that live in the gut may help control body weight and where fat is stored. The level of physical fitness of a woman as she enters menopause may affect body and fat gain as well as the numbers and types of bacteria in the colon.

To study this, we removed the estrogen-producing organs (ovaries) from two groups of rats to mimic menopause. One group was physically fit and the other group was overweight and unfit. The menopausal rats were compared to fit and unfit rats whose ovaries we did not remove. We measured body weight, food intake, and the amount of fat in the legs, belly and liver. We also measured the numbers and types of bacteria in the stool of the rats. The unfit 'menopausal' rats weighed more and had more belly fat and fat in their livers than both the unfit non-menopausal rats and the fit menopausal rats. The unfit menopausal rats also had more bacteria that are associated with disease, whereas the fit rats had less liver and belly fat, and they had more bacteria that are thought to be helpful. In addition, removal of estrogen from both groups of rats caused an important group of bacterial byproducts (short chain fatty acids) to decrease. These products are important for maintaining food intake, body weight and fat gain, and healthy blood glucose. These findings are exciting because we can change the types and numbers of gut bacteria by being physically active and eating a diet high in fruits, vegetables, whole grains and fermented foods like yogurt and kombucha. Women may be able to prevent or delay development of serious disease by taking care of their whole body, including the bacteria living in the gut.

Publication

[Ovariectomy results in differential shifts in gut microbiota in low versus high aerobic capacity rats.](#)

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