

Study finds moderate weight loss reduces levels of sex hormones linked to breast cancer risk

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Even a moderate amount of weight loss can significantly reduce levels of circulating estrogens that are associated with an increased risk of breast cancer, according to a study by researchers at Fred Hutchinson Cancer Research Center – the first randomized, controlled clinical trial to test the effects of weight loss on sex hormones in overweight and obese postmenopausal women, a group at elevated risk for breast cancer.

The findings by Anne McTiernan, M.D., Ph.D., and colleagues are published online ahead of the May 21 issue of the *Journal of Clinical Oncology*, a publication of the American Society of Clinical Oncology.

"Based on previous research, our results suggest that losing just 5 percent or more of one's weight could cut by a quarter to a half the risk for the most common, estrogen-sensitive breast cancers," said McTiernan, director of the Hutchinson Center's Prevention Center and a member of its Public Health Sciences Division. McTiernan cautions that these findings only apply to overweight or obese women who are not taking hormone-replacement therapy.

Epidemiologists have long noted a link between obesity and increased risk of postmenopausal [breast cancer](#). A relationship between body fat and estrogen production is thought to contribute to this risk.

The study was based on data from 439 overweight-to-obese, sedentary,

Seattle-area women, ages 50 to 75, who were randomly assigned to one of four groups: exercise only (mainly brisk walking), [diet](#) only, exercise plus diet and no intervention. At the end of the study, participants on the diet-only and diet-plus-exercise arms lost an average of 10 percent of their starting weight, which was the goal of the intervention.

The study measured the effects of diet- and exercise-related [weight loss](#) on blood levels of several types of [sex hormones](#), including three forms of estrogen (estrone, estradiol and free estradiol); two types of testosterone (total testosterone and free testosterone); a steroid necessary for the production of sex hormones (androstenedione) and sex hormone binding globulin, or SHBG, a protein that binds to sex hormones and therefore makes them less biologically active. High levels of SHBG are associated with reduced breast cancer risk. Free estradiol and free testosterone are forms of the hormones that are not bound to SHBG and therefore are more biologically active.

At the end of the study, the researchers found significant reductions in hormone levels among the women who received the dietary weight loss intervention, with the most striking results among those who both dieted and exercised:

- Estrone levels decreased 9.6 percent with diet and 11.1 percent with diet plus exercise.
- Estradiol levels decreased 16.2 percent with diet and 20.3 percent with diet plus exercise.
- Free-estradiol levels decreased 21.4 percent with diet and 26 percent with diet plus exercise.
- SHBG levels increased 22.4 percent with diet and 25.8 percent with diet plus exercise.
- Free-testosterone levels decreased 10 percent with diet and 15.6 percent with diet plus exercise.

The researchers found that losing as little as 5 percent of one's total body weight had a beneficial impact on hormone levels, and the effect increased with the amount of weight lost.

"The amount of weight lost was key to changes in hormone levels," McTiernan said. "The biggest effect was through diet plus exercise; exercise by itself didn't produce much of a change in weight or estrogen." However, exercise has many important benefits for those on a weight-loss program, she noted. Exercise prevents loss of muscle and bone, and it helps keep off the weight long term. "I recommend women both diet and exercise, because in the long run that should help keep weight down and therefore keep estrogens down," she said.

This is the first study to show that losing weight through a healthy diet that included reducing calories, reducing fat and increasing vegetables, fruits and fiber significantly lowers blood estrogen levels in postmenopausal women, McTiernan said. "This shows that it's never too late to make lifestyle changes to reduce your risk for breast cancer."

The results of the study also could be relevant to overweight women who take breast cancer prevention drugs such as tamoxifen, raloxifene and exemestane, which either block the action of [estrogen](#) or stop its production. "None of these medications are recommended for use beyond about five years, and they can have significant side effects in some women. Therefore, women need long-term solutions for managing their risk," McTiernan said. "Weight loss represents an additional option for long-term breast cancer risk reduction without significant or bothersome side effects."

More information: "Reduced-calorie Dietary Weight Loss, Exercise and Sex Hormones in Postmenopausal Women: Randomized Controlled Trial," *Journal of Clinical Oncology*.

Provided by Fred Hutchinson Cancer Research Center

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