Blocking opioid receptors could reduce hormone-therapy-fueled increases in sugar intake

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Estradiol is a commonly prescribed estrogen therapy. Previous research has found that rats treated with the hormone experience an increase in sugar consumption. But according to new research, blocking the body's opioid receptors can reverse this effect. The findings will be presented today at the American Physiological Society's (APS) annual meeting at Experimental Biology 2019 in Orlando, Fla.

Estradiol is a naturally occurring estrogen hormone and common medication used in various hormone treatments, such as menopausal hormone therapy and birth control. Previous studies by this research team found giving estradiol replacement in a rat model of menopause caused the rats to consume more of an offered sugar solution.

Because the opioid system is known to contribute to overindulgence of highly palatable foods, the researchers decided to examine its role in estradiol's impact on sugar intake. Rats were assigned to either estradiol treatment or a control. Researchers then continuously infused rats with either naltrexone, which blocks opioid receptors, or saline. In a second experiment, the research team injected naltrexone or DAMGO, a synthetic compound that stimulates the opioid system, into an area of the brain associated with reward (the nucleus accumbens). In the first experiment, naltrexone treatment reversed the estradiol-related increase in sugar consumption. Injection of DAMGO stimulated sugar intake in both treated and control rats, but the effect was smaller in estradiol-treated rats than in control rats. These suggests that the opioid system plays a role in the estrogen-induced enhancement of sugar intake, but opioid receptors in the nucleus accumbens is not likely to be directly involved in the estrogen-induced enhancement of sugar intake.

Lead author Kurumi Iida noted that these findings suggest that extra sugar intake caused by estradiol "is possibly mediated by the opioid system." However, a potential site of the action for this phenomenon remains unknown.

More information: Kurumi Iida, an undergraduate student at Nara Women's University in Nara, Japan, will present "Involvement of the opioid system in the 17?-estradiol-induced enhancement of sucrose intake in ovariectomized rats" Sunday, April 7, at a poster session in West Hall B of the exhibit hall of the Orange County Convention Center.

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