



Body Weight Changes in Obese Women and Menstruation

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In accordance with the dramatic increase in the obesity rate, around 20% of Korean women of reproductive age have been estimated to be obese (body mass index [BMI] ≥ 25 kg/m²) by the Korea National Health and Nutrition Examination Survey [1], a percentage that is similar to the American data [2]. Obese women tend to experience more menstrual irregularity than nonobese women, resulting in a higher rate of female infertility [3]. In previous data from the Korea National Health and Nutrition Examination Survey, metabolic syndrome was significantly associated with menstrual irregularity in reproductive-age women [4].

Ovulatory dysfunction takes place in obese women due to dysregulation of the hypothalamic-pituitary-ovarian axis [3]. Adiposity alters oocyte quality and endometrial receptivity via excess free fatty acids and adipokines [3,5]. Adipose tissue can be a source of estrogen through the aromatization of androgens, can decrease the capacity of estrogen to bind with sex hormone binding globulin, and stores steroid hormones [6].

Accordingly, interventions for weight loss in obese women have been attempted. However, the effect of weight loss in obese women on infertility is controversial. A recent large randomized controlled trial of 600 obese infertile women who underwent a 6-month lifestyle intervention showed that there was no difference in live birth rates compared with the control group [7]. Nonetheless, this study implied that weight loss before conception in obese women can ameliorate risks in pregnancy.

In this issue of *Endocrinology and Metabolism*, Ko et al. [1]

showed that BMI and waist circumference were larger in study subjects with menstrual irregularity than in those without menstrual irregularity, underscoring the findings of previous research. However, both participants who lost weight and those who gained weight were at a higher risk for menstrual irregularity, even after adjusting for covariates such as age, BMI, current smoking, heavy alcohol consumption, regular exercise, calorie intake, education, income, metabolic syndrome, age of menarche, parity, and stress perception (odds ratios, 1.74 and 1.45, respectively) [1]. A notable finding was that only subjects with obesity (BMI ≥ 25 kg/m²) and abdominal obesity (waist circumference ≥ 80 cm) presented significant associations. A weight loss of 3 to 10 kg for 1 year was associated with an increased risk of menstrual irregularity, which corresponds to the weight loss of 4.4 kg found in the 6-month intervention group in the previous RCT [7]. Although the study of Ko et al. [1] did not report any evidence regarding the putative mechanism by measuring female hormones, adiponectin, or leptin, an implication of this study is that abrupt weight change, regardless of weight loss or weight gain, can be harmful for menstrual health in the general population with obesity and abdominal obesity. Loss of adipose tissue shunts estrogen metabolism into a less potent inactivated form of estrogen [6]. Luteinizing hormone pulsatility is disrupted by acute nutritional deprivation [8]. Given the energetic aspects of reproduction, metabolic factors may play a fundamental role in mediating reproductive function [9].

The study population was derived from the Korea National

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Health and Nutrition Examination Survey, and an extreme low body weight group was not included. If a low body weight group (BMI <18.5 kg/m²) had been included in this study, weight loss would likely have been found to cause menstrual irregularity.

It is well-known that maintaining a healthy body weight is essential for a normal menstrual cycle. However, the effects of weight loss in obese women on menstrual irregularity and infertility remain to be determined.

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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