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OBESITY AND OVARIAN INSUFFICIENCY

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Abstract:

Overweight and obesity are one of the most pressing medical problems of the 21st century. According to 2016 data, 39% of the world's population over 18 years old (39% of men and 40% of women) is overweight. Obesity and excess body weight, among other problems, negatively affect a woman's reproductive function. Root cause Infertility in obesity is chronic anovulation. Today, assisted reproductive technologies are used to treat infertility in obese patients. However, a disease that contributes significantly to the number of unsuccessful attempts at artificial insemination is obesity. The results of the study showed that Treatment of infertility in overweight and obese women is the most important problem.

Keywords: *reproductive health, overweight, obesity, infertility, assisted reproductive technologies, preconception care.*

Introduction

INTRODUCTION. Overweight and obesity are the result of abnormal or excessive fat deposits, which can be harmful to health. According to the World Health Organization (WHO), in 2016, more than 1.9 billion adults over 18 years of age were overweight (39% of adults over 18 years of age: 39% of men and 40% of women).

Of these, over 650 million were obese (about 13% of the world's adult population: 11% of men and 15% of women). Body mass index (BMI) is a simple parameter often used to diagnose obesity and overweight in adults. The index is calculated as the ratio of body weight in kilograms to the square of height in meters (kg/m2) (Quetlet A., 1871). According to WHO, the diagnosis of "overweight" or "obesity" in adults is based on a BMI ≥25 kg/m2 or ≥30 kg/m2.

In addition to BMI, the most important indicator for determining the distribution of fat tissue and assessing health is waist circumference (WC), which is measured with a tape measure between the lower edge of the ribs and the upper edge of the pelvic bone (midway between the hypochondrium

and the pelvic bone along the mid-axillary line). The distribution of fat tissue is determined by the ratio of WC to hip circumference (WC/HC) – normally <0.85 for women and <1.0 for men.

Obesity is often combined with hormonal ovarian insufficiency. It has been shown that 45% of women with severe obesity develop reproductive dysfunction. The frequency of infertility in obese women is 33.6%, while in women with normal weight it is 18.6%. Women with obesity are 2-5 times more likely to develop various forms of menstrual cycle disorders, the frequency of uterine bleeding and endometrial pathology increases.

DISCUSSION: The causal role of obesity in the pathogenesis of reproductive system dysfunction is confirmed by the restoration of the ovulatory menstrual cycle after a decrease or normalization of body weight. An important role in the pathogenesis of ovarian hormonal insufficiency is played by the adipose tissue itself. For various species of animals and humans, there is a “critical” body mass necessary for the onset of sexual development.

In girls, the age of menarche coincides with an increase in body weight to an average of 47 kg. The most important factor for the onset of puberty is not so much body weight as the amount of subcutaneous fat and its ratio to body weight. In girls in the early puberty period, there is a significant increase in adipose tissue, by an average of 10 kg (120%), while the total body weight increases by only 44%. A minimum level of easily mobilized energy is necessary for the establishment of the menstrual cycle. An increase in the mass of adipose tissue leads to an increase in the peripheral conversion of androgens into estrogens, which occurs with the participation of the aromatase enzyme. In obese women, aromatase activity is several times higher than in women without obesity. The ratio of estrone/androstenedione, reflecting aromatase activity, in healthy women is 33 and increases with obesity to 50. The average level of estrone in the blood of obese women is 2 times higher than that of women with normal weight. Estradiol stimulates the replication of adipocyte precursors and thereby increases estrogen synthesis. Elevated estrone levels in the blood of patients with obesity and ovarian hormonal insufficiency support the hypothesis that hyperestrogenemia is one of the leading causes of anovulation in overweight women. Hyperestrogenemia sensitizes pituitary gonadotrophs to endogenous gonadotropin-releasing hormone of the hypothalamus. The threshold level of estradiol required for the onset of the ovulatory surge of LH, which occurs under physiological conditions when the follicle reaches a certain degree of maturity, decreases. Hyperstimulation of immature follicles probably underlies their cystic degeneration. Increased levels of insulin in the blood increase the sensitivity of the ovaries to gonadotropic stimulation and simultaneously inhibit the aromatization of androgens into estrogens.

Polycystic ovary syndrome (PCOS) is the most common endocrine disorder among women. It is closely associated with obesity - it is diagnosed in approximately 5-10% of obese women of reproductive age. However, these data are inaccurate: for example, according to the Rotterdam criteria, this figure reaches 20%. According to the ultrasound criterion, the frequency of detection of PCOS among patients with menstrual cycle disorders reaches 41%. PCOS is directly related to excess androgens in a woman's blood, which is mediated by impaired LH synthesis and insulin resistance. PCOS is manifested by chronic anovulation (in 80% of patients), amenorrhea, infertility, hirsutism and acne. Obesity, which occurs in the majority of patients with PCOS, increases the frequency of detection of hormonal and metabolic dysfunction. It is worth noting that the average BMI and the prevalence of obesity can be comparable among infertile women with and without PCOS. In the infertile population, the percentage of obese women is high, and obesity is similarly associated with infertility.

RESULTS: Weight loss in obese patients by 10-15% leads to restoration of the ovulatory menstrual cycle in 50-60% of women. They do not need further therapy with drugs that induce ovulation. It has been shown that against the background of weight loss pregnancy occurs in 29-35% of women.

The basis of obesity treatment is the use of a hypocaloric diet and increased physical activity. Non-drug therapy is carried out for 3-4 months. If attempts to lose weight with a low-calorie diet or with a BMI of more than 30 kg/m2 are unsuccessful, the use of drugs is recommended. A peripheral drug is orlistat, which reduces the absorption of fats in the gastrointestinal tract. Orlistat does not affect the central nervous system. Its mechanism of action is associated with the formation of a covalent bond in the lumen of the stomach and small intestine with the active serine site of gastric and pancreatic lipases. The inactivated enzyme loses its ability to break down fats, thereby preventing the absorption of about 30% of fat coming from food. Our study showed that the use of orlistat in combination with a hypocaloric diet in obese women with ovarian hormonal insufficiency resulted in a decrease in body weight by an average of 13.6 kg over 6 months, which was 15% of the initial body weight. During the weight loss, the waist circumference decreased by 16 cm and the hip circumference by 11 cm, which is consistent with the literature data on the decrease in abdominal-visceral fat mass with the use of orlistat. This contributes to an increase in insulin sensitivity and a decrease in hyperinsulinemia. The ovulatory menstrual cycle was restored in 52% of patients, in 42% of patients the menstrual cycle with NLF or anovulation was restored. Restoration of a full ovulatory cycle was confirmed by a reliable increase in the progesterone content in the blood. In patients with obesity and PCOS, the effectiveness of Xenical in relation to restoration of the ovulatory cycle was significantly lower.

CONCLUSION. Obesity (the epidemic of the 21st century, which has affected 13% of the adult population of the planet) is one of the factors associated with the disruption of reproductive function and menstrual cycle in women. And its frequency is only growing from year to year. The mechanisms of dependence of decreased fertility due to obesity are complex and multifactorial. Serious problems for the onset of pregnancy in women with obesity are the frequent development of PCOS and insufficiency of the luteal phase of the menstrual cycle, insulin resistance, hyperandrogenism.

All of this can lead to anovulation. Obesity also increases the risk of developing some complications and serious health problems during pregnancy, childbirth and after them. Most studies on infertility focus on women, while the male factor in diagnosing infertility in a couple is present in 51% of cases. Management of patients with obesity should consist of a correct and individual approach to treatment.

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