



Do Glucagon-Like Peptide-1 Receptor Agonists Have an Effect on Sperm Parameters?

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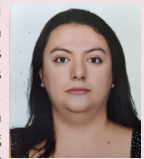
Obesity is a common metabolic health problem that affects male fertility, especially sperm parameters, due to hormonal effects and pathophysiological changes. In recent years, obesity is no longer considered a weight problem, but a chronic, relapsing and treatable disease. It is known that there is an interaction between high BMI (body mass index) and sperm parameters, especially concentration, in infertile men (1).

In addition to lifestyle modification for obesity, GLP-1 (glucagon-like peptide-1) receptor agonists (RA) can be used in patients with a high body mass index (BMI ≥ 30) or co-morbid conditions (BMI ≥ 27). GLP-1 receptor agonists stimulate the satiety centre, slow down gastric movements and increase postprandial insulin release. GLP-1 RA was primarily developed for the treatment of diabetes and has now also been approved by the FDA (Food and Drug Administration) for weight loss. GLP-1 receptor agonists can have a positive effect on the hypothalamic-pituitary-gonadal axis and spermatogenesis in male infertile patients by significantly reducing weight. In some studies, GLP-1 receptors have been detected in the Sertoli and Leyding cells of the male reproductive system (2-6). The study that demonstrated the presence of GLP-1 in Sertoli cells also found that high GLP-1 levels reduce mitochondrial membrane potential and oxidative damage by regulating glucose and energy metabolism, which affects spermatogenesis, while low GLP-1 levels increase the conversion of glucose to lactate (7).

In obese mice, proinflammatory cytokines (TNF- α , MCP-1 and F4/80) have been shown to negatively affect sperm quality by increasing mRNA expression in the testes. A single daily administration of the GLP-1 receptor agonist exenatide (over a period of about 8 weeks) reduced the expression of proinflammatory cytokines (8).

In a study conducted in healthy male volunteers investigating the effect of GLP-1 RA on LH (luteinizing hormone) and testosterone secretion, continuous GLP-

Canan Tapkan, a surgeon, studied at Eskişehir Osmangazi University from 2004 to 2010 and completed her specialization in obstetrics and gynecology at Dr. Zekai Tahir Burak Obstetrics and Gynecology Hospital from 2011 to 2015. Since 2016, she has been working at Ankara Keçiören Training and Research Hospital, where she served as an administrative assistant for two years. In 2020, she actively participated in the pandemic response. Starting in 2022, she established the Pregnancy School, where she actively trained participants and continued her work at Ankara Atatürk Sanatorium Training and Research Hospital. In 2025, she received training in assisted reproductive therapies at Ankara Bilkent City Hospital.



1 infusion led to a reduction in LH levels but had no significant effect on testosterone, FSH (follicle stimulating hormone) and leptin levels (9).

In a study of men with metabolic hypogonadism, liraglutide was shown to increase testosterone and SHBG (sex hormone-binding globulin), improve the quality of erectile function and provide metabolic protection for reproductive and sexual function (10).

Recent clinical studies suggest that weight loss with GLP-1 RA has a positive effect on male infertility and improves sperm count, concentration and motility. However, further studies are needed to clarify the effect of GLP-1 and its receptor agonists on male reproductive hormones.

Competing Interests

None.

Ethical Issues

Not applicable.

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