

Significance of Gonadotropins in Treating Infertility

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DESCRIPTION

Gonadotropins are injectable medications that are frequently used in fertility treatment. These medications are now primarily used in conjunction with *In Vitro* Fertilization (IVF) therapy. Gonadotropin therapy is essential in the treatment of infertility through ovarian stimulation. Gonadotropins are either recombinant (made in a lab) or purified versions of the naturally occurring hormones Follicle Stimulating Hormone (FSH) and Luteinizing Hormone (LH). These hormones promote follicle growth and as the follicles develop, the egg matures and prepares to accept a sperm through fertilization.

Over the last century, efforts have been made to improve gonadotropin preparations. Current gonadotropins have unquestionably higher quality and safety profiles, as well as clinical efficacy, than previous generations. The use of recombinant technology in the production of Follicle-Stimulating Hormone, Luteinizing Hormone, and Human Chorionic Gonadotropin (hCG) has been a significant accomplishment. Recombinant gonadotropins are purer than urine-derived gonadotropins, and using mass filling in vials virtually eliminated batch-to-batch variations and allowed for precise dosing. The introduction of prefilled pen devices for more patient-friendly ovarian stimulation has been stimulated by recombinant and fill-by-mass technologies. The fixed combination of follitropin alfa+lutropin alfa, long-acting FSH gonadotropin, and a new family of prefilled pen injector devices for recombinant gonadotropin administration are among the most recent developments. The production of orally bioactive molecules with selective Follicle-Stimulating Hormone and Luteinizing Hormone activity is the next step.

To stimulate ovulation, gonadotropins (follistim, menopur, and gonal-f) are used. Follistim and Gonal-F are only used to stimulate FSH. They are either derived from the urine of Italian postmenopausal nuns or synthesized in a laboratory. Although a minority of patients will benefit from the Luteinizing Hormone containing product, all products have the same expected pregnancy rates and the subcutaneous injections of gonadotropins are used. The response to the drug determines the dose and duration of treatment. When the eggs are mature,

a second hormone injection, Human Chorionic Gonadotropin (hCG), is administered subcutaneously. This hormone promotes egg production which is called ovulation. Injection of hCG determines the precise timing of egg release to time intercourse or artificial (intrauterine) insemination 36 hours later. Ovulation rarely occurs prior to hCG administration (and interfere with timing of insemination or intercourse).

Gonadotropins are extremely effective at inducing ovulation. Approximately 90% of HMG-treated women will ovulate. Pregnancy rates vary depending on the presence and response of other infertility factors. Gonadotropin treatment combined with Intra Uterine insemination (IUI) results in a pregnancy rate of 18%-19% per cycle for all-comers. For three completed treatment cycles, the cumulative pregnancy rate is around 30%. If timed intercourse is used instead of IUI, pregnancy rates are roughly half that.

Treatment with gonadotropins usually has no significant side effects, but it can occasionally cause headaches or mood changes. The main risks of HMG therapy are ovarian cyst formation and multiple pregnancy. Small ovarian cysts are not uncommon during treatment and usually do not pose a significant medical problem. The cysts will usually disappear by themselves within a month. Massive ovarian enlargement is a rare risk where the ovaries enlarge in this condition, causing a significant medical illness with loss of body fluid into the abdomen or chest and are associated with an increased risk of vascular thrombosis (blood clot forming in a vein or artery). This condition may necessitate hospitalization and is potentially fatal. The routine blood test for oestrogen is intended to prevent the development of massive ovarian enlargement. The level of oestrogen in the blood predicts the likelihood of ovarian enlargement during the treatment cycle. The medication dose is adjusted accordingly. If the blood oestrogen level rises above the safe level, the treatment will be stopped immediately. Ovarian enlargement will occur only if ovulation occurs. Ovulation usually does not occur unless a second hormone, Human Chorionic Gonadotropin (hCG), is administered. Again, the overall risk of massive ovarian enlargement is less than 1%, and our close monitoring is intended to assist in avoiding this problem.

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Received: 02-Mar-2023, Manuscript No. JFIV-23-21461; **Editor assigned:** 06-Mar-2023; PreQc No. JFIV-23-21461 (PQ); **Reviewed:** 20-Mar-2023, Qc No. JFIV-23-21461; **Revised:** 27-Mar-2023, Manuscript No. JFIV-23-21461 (R); **Published:** 03-Apr-2023, DOI: 10.35248/2375-4508.23.11.296

Citation: Ikeguchi A (2023) Significance of Gonadotropins in Treating Infertility. *J Fertil In vitro IVF World w Reprod Med Genet Stem Cell Biol.* 11:296.

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CONCLUSION

Because gonadotropins are essential hormones in the regulation of a woman's natural menstrual cycle, they are used for ovarian stimulation in assisted reproduction. As a result, administering gonadotropins to the patient exogenously will allow the specialist to better control the cycle, the maturation of a greater

number of follicles, and the timing of ovulation. All of this increases the likelihood of successful assisted reproduction treatments. It can be used to treat infertility and improve pregnancy chances as part of an Assisted Reproductive Technology (ART) or *In-Vitro* Fertilization (IVF) cycle. These medications have been in use for decades and are Food and Drug Administration (FDA) approved for this purpose.