**Understanding Fertility Medications**

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As couples make the decision to seek advanced fertility treatment, they may often become quickly overwhelmed with all the different medications they will need to take. Before treatment begins, fertility patients will likely learn about their treatment protocol, which may include taking drugs that provide or suppress hormone activity. Throughout the treatment protocol, patients are scheduled to visit their IVF center so their physician can monitor the effects of the medications and make necessary adjusts where needed to optimize treatment outcome.

Obviously physicians practicing in this area of medicine understand all the medications and the best protocols for patients, but may not always have the time to explain in great detail all the drugs and why they are being used. This article is being written for fertility patients who desire to know more about fertility medications, including simple explanations about their mechanism of action and timing at which they are being prescribed.

**The Natural Female Menstrual Cycle**

Probably the best way to begin understanding fertility medications is to first have a solid understanding of the natural female menstrual cycle. The cycle begins when both estrogen and progesterone drop in the blood stream. We will talk more about estrogen and progesterone later but for now it is important to understand that it is the drop of these two hormones that trigger the start of the menstrual cycle. When these hormones fall in the blood stream, two main things will occur including:

1. The uterine lining will shed and menstrual bleeding will begin. Note: the first day of bleed marks the first day of the cycle.
2. Low levels of estrogen and progesterone in the blood trigger organs in the brain (hypothalamus and pituitary gland) to begin producing two hormones called FSH (follicle stimulating hormone) and LH (luteinizing hormone).

FSH and LH travel through the blood stream and activate the ovaries to begin growing follicles. Each follicle is sphere shaped and contains one egg. FSH and LH will continue to be produced in the brain for approximately the next 14-15 days, and follicles will continue to grow and eggs to mature. Throughout this time period, also known as the follicular phase of the cycle, growing follicles will produce the hormone estrogen. Estrogen in turn acts on the uterus to grow the uterine lining in preparation for embryo implantation.

At the tail end of the follicular phase (approx. day 14 or 15 of the cycle), the pituitary gland in the brain will produce a large amount of LH, also known as the LH surge. The LH surge acts to final maturate the eggs and causes the largest follicle on the ovary, also known as the graafian follicle to rupture.

The rupturing follicle will then release a mature egg (ovulation) into the fallopian tube, where it may or may not become fertilized. The remaining ruptured follicle itself found on the ovary then becomes a short lived endocrine organ called the corpus luteum. The corpus luteum’s funtion is to produce both progesterone and estrogen. Progesterone acts on the uterine lining to create a sticking environment for potential embryo implantation. The act of ovulation and the creation of the corpus lutuem mark the beginning of the luteal phase (approx. 16-28), the last phase of the cycle.

If fertilization takes place, the fertilized egg will become an embryo, and travel down into the uterus, where it may or may not implant onto the uterine wall. If embryo implantation (pregnancy) occurs, the implanted embryo begins to produce the hormone HCG (human chorionic gonadotropin). The production of HCG will direct the corpus luteum to continue to produce the hormone progesterone, which allows the pregnancy to continue. If a pregnancy does not occur, HCG is never produced and eventually the corpus luteum will degenerate and stop producing the hormones estrogen and progesterone. As a result, estrogen and progesterone will drop in the blood stream, and a new menstrual cycle will begin.

The above overview of the natural menstrual cycle provides us a good foundation for understanding the various fertility medications used in fertility treatment protocols today.

**FSH and LH Medications**

Just like the natural FSH produced by the brain described above, commercially produced FSH drugs also act on the ovaries to produce follicles and eggs. The following FSH drugs listed below are commonly prescribed today: Follistim, Gonal-f, and Bravelle.

Menopur and Repronex also act on the ovaries to produce follicles and eggs but contain equal amounts of both FSH and LH. Physicians often prescribe these medications because they have LH activity, and it is theorized that LH is essential to the follicles ability to produce the hormone estrogen. It is not uncommon for physicians to use both FSH only drugs and FSH andLH drugs in combination in the same treatment protocol.

**HCG Medications**

The next class of medications contains HCG (human chorionic gonadotropin) activity, and are prescribed to mimic the LH surge that occurs in the natural menstrual cycle. From the onset this may not make sense because HCG was described as a hormone being produced by the implanted embryo in the natural menstrual cycle.

To mimic the natural LH surge, physicians can prescribe a bolus dose of HCG to final maturate the eggs because HCG has the same biological activity as LH. In case you are wondering why physicians do not just use an LH hormone to mimic the natural LH surge, there are two reasons. The first is that there is no LH alone hormone available on the market today indicated for producing an LH surge, and the second reason deals with LH not having the pharmacological properties to efficiently deliver an effective LH surge.

HCG will cause your follicles to rupture, like an LH surge does in a natural menstrual cycle. However, your physician will schedule your egg retrieval well before follicle rupture will occur.

The following HCG drugs listed below are commonly prescribed today: Pregnyl, Novarel, Ovidrel, and

HCG (Generic).

**GnRH Agonist and antagonist Medications**

While the above HCG medications reflect naturally occurring hormones in the natural menstrual cycle, the next two medications we will discuss are hormones that impact the action of GnRH (gonadotropin releasing hormone). Naturally occurring GnRH is produced by the hypothalamus in the brain and works with the pituitary gland to produce both FSH and LH.

GnRH agonists are synthetic drugs that cause the release of FSH and LH initially but with continued use quickly suppress these hormones, thereby creating a clean slate on which to create a controlled ovarian hyperstimulation cycle for IVF. GnRH antagonists are used in controlled ovarian hyperstimulation cycles for IVF.

GnRH agonists and antagonists are prescribed by physicians during fertility treatment to essentially disable the pituitary gland from producing both LH and FSH. So if FSH and LH are so important to helping the ovary produce follicles and eggs, why would a physician want to disable the production of these two hormones during an IVF treatment protocol? Simply put the answer is control: This allows the physician to have control over the patient’s response to medications that are prescribed. If a physician prescribes hormones like FSH and LH and then allows the body to also produce its own hormones, the cycle may be become unpredictable and result it poor outcomes. For example if the pituitary gland is not disabled during an IVF treatment protocol, it is possible the pituitary gland could produce a naturally occurring LH surge. If this happened during a treatment cycle, it is likely that all the follicles would rupture and all eggs would be released, leading to spoiled treatment cycle because the physician would have no egg to retrieve.

The GnRH Agonist discussed above that is commercially available is Leuprolide Acetate Injection (Generic), the GnRH antagonistsunder the following drug names: Ganirelix Acetate Injection and Cetrotide

**Progesterone Products**

The last group of medications that we will discuss are the progesterone products. As you know from the natural cycle overview above, progesterone production is generated by the corpus luteum, and is essential for helping maintain a pregnancy. The vast majority of physicians will prescribe progesterone shortly after the egg retrieval to prepare the uterine lining for embryo implantation. If it’s discovered that the IVF treatment cycle resulted in a successful pregnancy, progesterone is often times continued for the first 6-12 weeks post pregnancy.

The progesterone products discussed above are commercially available under the following drug names: Crinone, Endometrin, Prometrium and Progesterone in Oil injection.

**Conclusion**

These medications are some of main drugs prescribed during fertility treatment, but do not represent by far all drugs being used to treat infertility today.

We have all heard the expression “Knowledge is Power”, and understanding your fertility medications before you seek treatment can only help your chances of achieving a pregnancy. In closing, I would like to wish anyone reading this article that might be seeking or considering fertility treatment the best of luck.

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*Disclaimer – this article was not written by a physician and should not in any way be considered as substitute for the medical advice of your healthcare provider.*

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