

## Comparison of IVF and Superovulation/IUI Treatments



IVF (In-Vitro Fertilization) and IUI/superovulation (intrauterine insemination with injectable fertility medications) are both treatments that are used in more complex fertility disorders. We first need to understand their similarities in order to understand their differences. Many fertility disorders can be treated by specific therapies which address the problem. These therapies include the treatment of hormone problems such as thyroid or prolactin disorders. Many ovulatory disorders such as PCO (polycystic ovary disease) can be treated with ovulation induction using Clomid (clomiphene citrate). Many sperm problems can be corrected with medical treatment while tubal disease in women can be corrected with surgery. When these treatments are insufficient for success or when the couple has male factor infertility that cannot be corrected then the use of IVF and IUI/superovulation becomes necessary.

Both treatments utilize injectable fertility medicines to create many extra eggs in a single ovulation cycle. These medicines (Gonal-F, Follistim, Bravelle and Menopur) have as their primary constituent the hormone FSH (Follicle Stimulating Hormone). FSH directly stimulates the ovaries to produce eggs. In a natural cycle FSH is very limited and only a small amount is released by the anterior pituitary gland to produce a single egg in each cycle. In both of these treatments the patient self administers FSH injections in amounts that are super-physiologic leading to the production of a larger amount of eggs per cycle. Both treatments require careful monitoring to assess the rise of the hormone estradiol (an estrogen) and to count the follicles (sacs containing eggs) on a nearly daily basis. This information facilitates the daily dose regulation to achieve a good but not excessive response. The treatments are begun with a menstrual flow and then continue for approximately 8 - 10 days. Once the leading follicles reach a size of approximately 18 mm a different injection, hCG (human Chorionic Gonadotropin) is administered to trigger ovulation. hCG is the pregnancy hormone which mimics LH (Leutinizing Hormone), the hormone usually leading to ovulation in a natural cycle. hCG is more effective in this situation because it has a longer half-life and better supports the production of Progesterone for the maintenance of the pregnancy. In any case, for IVF an oocyte retrieval is planned 35 1/2 hours later to obtain the eggs from the woman's ovaries. These eggs are then fertilized to create embryos which are subsequently transferred into the woman's uterus 2 to 5 days later. With IUI/superovulation an intrauterine insemination (filtering and placing the partner's sperm into the uterus) is planned 24 to 36 hours after the hCG injection. Both treatments then require some Progesterone support afterwards to maintain a successful pregnancy.

The obvious difference at the very end of the treatment is: 1) In IVF you retrieve the eggs from the woman's body and create embryos outside of the body, to then subsequently replace them into the uterus; and 2) In IUI/superovulation you augment the woman's fertility by increasing egg production and estradiol, but you rely on the woman's body, tubes and pelvis to orchestrate fertilization, transport the sperm to the egg and then transport the embryo from the tube into the uterus where it will implant to create a pregnancy. This difference has many implications which lead to a great variance in success and effectiveness. Overall, IVF is twice as successful as IUI/superovulation. In 30 to 35 year old woman IVF can have a success rate of greater than 50% per treatment and IUI/superovulation has a success rate of 20 - 25%. The latter will bring infertile patients to a normal success rate while IVF actually provides a better success rate than nature in normal couples. IVF is also absolutely necessary in cases of severe tubal disease where the tubes are blocked or will not transport the embryo. IVF is also necessary in cases of severe sperm defects when the sperm is unable to naturally enter the egg. A technique called ICSI (IntraCytoplasmic Sperm Injection) which is only available with IVF, is then used to inject a single sperm into the egg to achieve fertilization that would otherwise be impossible. With IVF the doctor and the patient can limit the amount of embryos placed into the uterus, but with IUI/superovulation the number of eggs ovulating and potentially implanting as embryos cannot be controlled as well. IVF also offers the opportunity to perform genetic testing on embryos prior to transfer into the uterus. This helps a couple avoid miscarriage, genetic diseases and facilitates sex selection.

In conclusion, IUI/superovulation can provide great improvement in fertility in couples who do not have severe tubal disease or severe male factor infertility. However, IVF can bypass these more severe conditions and can also more rapidly achieve success in less severe medical problems. IVF can decrease the risk of high order multiple pregnancy (triplets or higher) but still has a high risk of twins. Genetic testing is possible with IVF. IVF is considerably more expensive than IUI/superovulation due to the dependence and the laboratory and high end technology for its performance and often attempts to succeed with IUI/superovulation are required prior to IVF being covered by many health insurance plans in New Jersey.

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