

Intrauterine Insemination

Intrauterine insemination (IUI), also known as artificial insemination, is one of the earliest and simplest assisted reproductive technologies (ART). With this technique, sperm from either a partner or donor (such as from a sperm bank) is inserted with a syringe into the woman's vagina during ovulation to increase the probability that fertilization will occur and lead to pregnancy. This procedure is most effective for couples with male fertility problems, such as impotence, though it is also used to treat idiopathic (of unknown cause) infertility, vaginismus (wherein the female involuntarily constricts her vagina), and hostile female cervical mucus that rejects sperm. In the 1940s and 1950s cryopreservation facilitated the preservation of sperm through freezing methods for later use, such as in IUI.

IUI has a long history, first in animals and later in humans. The use of this procedure in animals dates back to the fourteenth century when Arabs used it to breed stallions. Lazzaro Spallanzani is known as the first to use the technique to breed dogs in late 1784. In London in 1793, John Hunter was the first person reported to achieve a successful human pregnancy using IUI. Although Hunter received credit for the first human pregnancy using the procedure, it is likely there were earlier successful attempts.

Hunter began by collecting semen from a husband who had hypospadias, an inability to ejaculate sperm, by making an incision into the man's testis. He then inseminated the wife by placing the husband's semen in her cervix with a tool similar to a turkey baster, resulting in a successful pregnancy. James Marion Sims later attempted IUI in the United States with six women in 1866, but had a low success rate because he did not fully understand a woman's menstrual cycle—he mistook menstruation for the ovulation period.

For IUI, the physician collects semen from the partner or a donor either through masturbation or a collection condom, and the semen is then manually placed in the woman's cervical canal during ovulation. If the male has trouble ejaculating, physicians can surgically remove sperm from the testis.

IUI is a good option to combat male infertility when the cause is oligozoospermia (too few sperm) or if a portion of the sperm is abnormal. For oligozoospermia, the sperm is concentrated before insemination by removing some of the seminal plasma, which is the liquid portion of the semen. For men whose sperm have low motility or some that are abnormally shaped, physicians can treat the sperm with drugs to aid motility or select out the healthy sperm for insemination.

If a male's infertility problems cannot be resolved, donor sperm from another male is a possibility. Donor sperm, often from a sperm bank, is also a common option for single women who desire children without a husband or a partner. Sperm donations at sperm banks are treated as anonymous, and donors are stringently checked for sperm viability, sexually transmitted diseases, and genetic disorders, with 38% or more of potential donors rejected for any of those reasons.

The physician collects sperm from the male or defrosts preserved sperm just prior to the woman's ovulation period. The time of ovulation can be determined through a blood test to detect a surge of luteinizing hormone in the blood. If necessary, the semen is treated with drugs to increase motility or the sperm concentration if either of these is a fertility problem. The semen is then placed into the cervix with a large pipette, the location depending on whether she has cervical problems that could cause rejection of the sperm.

Recently, the popularity of IUI has decreased dramatically with the introduction of newer and better techniques such as in vitro fertilization, that offer a greater chance of achieving pregnancy.

However, IUI remains a viable and lower-cost option for many women seeking pregnancy.

Sources

1. Brody, Steven A., and Robert G. Edwards. Principles and Practice of Assisted Human Reproduction. Philadelphia: W.B. Saunders Company, 1995.
2. Burfoot, Annette, ed. Encyclopedia of Reproductive Technologies. Boulder: Westview Press, 1999.