

## INFERTILITY: CAUSES, DIAGNOSIS, AND TREATMENT METHODS

Sultonbekova Ruxshona Xushnudbek kizi

Kokand University Andijan branch

Faculty of Medicine treatment direction group 24-34

+998949490211 Davronovhushnut @gmail.com

Senior lecture: Tillaeva Xamro Xudoyberdievna

**Abstract:** Infertility is a reproductive health disorder characterized by the inability of a male or female to conceive, which is a widespread issue worldwide. This article provides a comprehensive overview of the types of infertility, its main causes, diagnostic methods, and modern treatment approaches. Additionally, the psychological and social impact of infertility, along with preventive measures, are discussed.

**Keywords:** infertility, reproductive health, male infertility, female infertility, diagnosis, treatment, artificial insemination, genetic factors, hormonal imbalance.

**Аннотация** Бесплодие — это расстройство репродуктивного здоровья, которое характеризуется неспособностью мужчины или женщины зачать, являющееся широко распространенной проблемой по всему миру. В статье представлен всесторонний обзор видов бесплодия, его основных причин, методов диагностики и современных подходов к лечению. Также рассматриваются психологические и социальные последствия бесплодия, а также профилактические меры.

**Ключевые слова:** бесплодие, репродуктивное здоровье, мужское бесплодие, женское бесплодие, диагностика, лечение, искусственное оплодотворение, генетические факторы, гормональный дисбаланс.

Having children is one of the most significant events in a person's life. However, not all couples can achieve this joy. Globally, one in six couples faces infertility-related problems. This issue affects both men and women equally, requiring active participation from both partners in the treatment process. Although infertility has been extensively studied in medicine, identifying its precise causes remains challenging in some cases. Numerous medical and biological factors, lifestyle choices, and environmental conditions can contribute to infertility. This article thoroughly examines these factors, diagnostic methods, and modern treatment options.[5]



**Infertility** is defined as the inability of a couple to conceive after one year of regular, unprotected sexual intercourse.

Infertility is categorized into two main types:

1. Primary infertility – when a male or female has never achieved pregnancy before.
2. Secondary infertility – when a person has had a previous pregnancy but is unable to conceive again naturally.

Additionally, infertility can be classified into the following forms:

>Male infertility – the inability to conceive due to dysfunction in the male reproductive system.

>Female infertility – the inability to conceive due to pathologies in the female reproductive system.

>Unexplained infertility – cases where medical examinations show no abnormalities, but pregnancy does not occur.

Furthermore, infertility can be absolute or relative:

Absolute infertility – occurs when congenital or acquired reproductive organ defects make conception impossible.

Relative infertility – results from temporary conditions that may be corrected through treatment.

### **Causes of male infertility**

Male infertility can develop due to various factors. The main causes include:

Sperm quality disorders

Oligospermia – a low sperm count in semen. Oligospermia is a medical condition characterized by a lower than normal number of spermatozoa in men, as detected in spermogram tests. There are various degrees of oligospermia, and it is one of the most common causes of infertility.[1]

There are several main causes of oligospermia:

1. Hormonal imbalances A decrease in the levels of testosterone and other sex hormones (LH, FSH) can disrupt the normal functioning of the hormonal system, reducing sperm production.
2. Genetic factors . Some men may experience oligospermia due to genetic disorders. For example, Klinefelter syndrome (XXY chromosomal structure) or Y-chromosome microdeletions (loss of certain parts of the Y chromosome) can disrupt the sperm production process.
3. Congenital abnormalities  
Congenital defects in the male reproductive system, such as underdeveloped testes or defects in the epididymis, can lead to oligospermia.
4. Lifestyle factors . Smoking, alcohol consumption, poor nutrition, excessive heat exposure (from saunas or hot baths), and lack of physical activity can reduce sperm count.
5. Inflammatory diseases infections such as orchitis, epididymitis, and prostatitis can harm the male reproductive system and reduce sperm production.
6. Stress. Chronic psychological stress can disrupt hormone production and decrease both the quality and quantity of sperm.
7. Environmental factors . Exposure to harmful chemicals, heavy metals, or other environmental toxins can lead to oligospermia.

Diagnosis of oligospermia. To diagnose oligospermia, a spermogram test is performed, where the number, motility, and shape of sperm are evaluated. Typically, a normal sperm count should be over 15 million sperm per milliliter. If the number is lower than this, the

man is considered to have oligospermia.

Additionally, hormonal tests, ultrasound examinations, genetic tests, and tests for infections may be necessary to fully assess the condition.

Asthenospermia – reduced sperm motility.

Teratospermia – abnormal sperm morphology.

Azoospermia – the complete absence of sperm in semen.[6,7]

**Hormonal imbalance** A crucial factor in male infertility is testosterone deficiency or dysfunction of the hypothalamic-pituitary system, which disrupts testosterone synthesis and sperm production. Inflammatory diseases infections such as prostatitis, orchitis, and epididymitis can significantly impair sperm quality and male reproductive function.

**Genetic Factors** Some congenital genetic disorders lead to male infertility, including: Klinefelter syndrome (XXY chromosome pattern) – testicular failure. Y-chromosome microdeletions – sperm production impairment.

**Lifestyle factors** . Alcohol consumption, smoking, stress, poor diet, and a sedentary lifestyle contribute to decreased sperm quality and overall reproductive health.

#### **Causes of female infertility .**

Ovulation is a natural process in a woman's reproductive system where an egg is released from the ovaries and travels into the fallopian tubes. Ovulation is a crucial phase for pregnancy to occur, as the egg must be fertilized by sperm to result in conception. Ovulation is the central part of a woman's menstrual cycle.

Ovulation happens in several stages:

1. **Follicular Development:** During the first phase of the menstrual cycle (follicular phase), multiple follicles in the ovaries start to develop. Each follicle contains an egg. During this phase, levels of follicle-stimulating hormone (FSH) and estrogen increase.[1]
2. **Egg Growth:** Within each follicle, the egg grows, but only one follicle (dominant follicle) fully matures and is ready to release the egg.



3. Ovulation: The process of ovulation occurs when the dominant follicle releases the egg into the fallopian tube. This is triggered by a rise in luteinizing hormone (LH). Ovulation typically occurs around the 14th day of a 28-day menstrual cycle, though this may vary depending on cycle length.[1,2,3]

4. Egg Release into the Fallopian Tubes: The egg leaves the ovary and enters the fallopian tube. The egg's viability lasts for a short period, usually 12 to 24 hours. If sperm fertilizes the egg, pregnancy can occur.

5. Luteal Phase: After ovulation, the ruptured follicle transforms into the corpus luteum, which secretes progesterone. This hormone prepares the uterus for possible implantation of a fertilized egg.

#### Types of ovulation

1. Natural Ovulation: Most women experience natural ovulation, which occurs without medical intervention.

2. Induced Ovulation: Some women may require medical assistance to induce ovulation, especially those with ovulatory dysfunction. Ovulation may be stimulated using medications like clomiphene citrate or gonadotropins.

3. Polycystic Ovary Syndrome (PCOS): Women with PCOS often experience irregular ovulation or anovulation (lack of ovulation) due to multiple small cysts in the ovaries that prevent the development of a mature egg.

Ovulation is crucial for conception, as without the release of an egg, fertilization by sperm cannot occur. Knowing when ovulation takes place is vital for pregnancy, as the egg's lifespan is brief – only 12-24 hours.[2,5]

#### Common signs of ovulation include:

1. Cervical Mucus Changes: During ovulation, cervical mucus becomes more fluid, clear, and stretchy, which facilitates sperm movement.

2. Ovulation Pain: Some women experience mild abdominal pain or cramping during ovulation, known as "mittelschmerz."

3. Temperature Changes: Basal body temperature (BBT), measured consistently in the morning, rises after ovulation and remains elevated during the luteal phase.

4. Breast Tenderness: Hormonal fluctuations during ovulation may cause breast tenderness or swelling.

5. Vaginal Discharge Changes: Ovulation often leads to an increase in vaginal discharge, which is clear and stretchy, providing the ideal environment for sperm to travel.

#### Conditions related to ovulation



1. Polycystic Ovary Syndrome (PCOS): This hormonal condition often leads to irregular ovulation or anovulation due to numerous small follicles within the ovaries.

2. Hypothalamic-Pituitary Dysfunction: This condition affects the normal functioning of the hypothalamus and pituitary gland, which can disrupt the ovulation process.[5,6]

3. Infections or Inflammation: Infections like salpingitis or endometriosis can impair the ovulation process and affect fertility. Several methods are used to determine ovulation:

1. Basal Body Temperature Monitoring: A slight increase in basal body temperature after ovulation can indicate that ovulation has occurred.

2. Ovulation Predictor Kits: These test urine for an increase in LH, which typically occurs just before ovulation.

3. Ultrasound Monitoring: Ultrasound is used to monitor follicle development and predict the timing of ovulation.

Pathologies of the uterus and fallopian tubes

>Endometriosis

>Uterine fibroids

>Congenital defects

Tubal obstruction due to inflammation

Autoimmune factors. The immune system may produce antibodies against sperm or egg cells, leading to infertility.

Lifestyle and environmental factors

Obesity, stress, harmful habits, and environmental factors play a significant role in infertility.

4. Diagnostic methods .The following methods are used to diagnose infertility:

For men: sperm analysis, hormonal tests, ultrasound, genetic tests.

For women: ovulation tests, hormonal tests, hysterosalpingography, laparoscopy.

Modern treatment methods

Hormonal therapy

Artificial insemination (IVF, IUI)

Surgical procedures[1,6,8]

## Conclusion

Infertility is not only a medical challenge but also a psychological and emotional burden for individuals and couples. It affects millions of people worldwide, impacting both men and women. To effectively address infertility, it is crucial to understand its diverse causes, which can range from hormonal imbalances to genetic factors and lifestyle choices. Treatment options are available, including medical interventions such as hormonal therapy, assisted reproductive technologies (e.g., IVF and IUI), and surgical procedures. However, these treatments must be tailored to the specific needs and conditions of each individual. A comprehensive approach to infertility involves early diagnosis and intervention. Routine health check-ups, regular monitoring of reproductive health, and a focus on maintaining a healthy lifestyle can significantly reduce the risk of infertility. In addition to medical treatments, psychological support is also essential for managing the emotional strain that often accompanies infertility struggles. It is important for couples to work together and seek

professional guidance to navigate through this difficult journey. Ultimately, with advancements in reproductive medicine, many couples who once thought they could never have children are now finding hope through various treatment options. Ongoing research into the causes and treatment of infertility holds promise for even more effective and accessible solutions in the future. Preventative measures, lifestyle changes, and early medical intervention will continue to play vital roles in addressing and reducing infertility cases globally.

## References

1. World Health Organization (WHO). (2021). Infertility: A Growing Global Health Issue. Retrieved from <https://www.who.int>
2. Zegers-Hochschild, F., Adamson, G. D., Dyer, S., et al. (2009). The International Committee for Monitoring Assisted Reproductive Technologies (ICMART) and the World Health Organization (WHO) revised glossary of ART terminology. *Human Reproduction*, 24(11), 2683-2688.
3. Kovu, G., & Rege, J. (2018). Male and Female Infertility: Current Trends in Diagnosis and Management. *Journal of Reproductive Medicine*, 63(4), 102-109.
4. Liu, Z., & Wei, D. (2016). The role of genetic factors in infertility. *Journal of Genetics and Genomics*, 43(1), 25-36.
5. Stewart, A., & Oliver, J. (2017). Psychosocial aspects of infertility: Coping and the emotional impact on couples. *Journal of reproductive Health*, 44(2), 165-170.
6. ACOG (American College of Obstetricians and Gynecologists). (2020). Infertility Treatment Guidelines. Retrieved from <https://www.acog.org>
7. Dahan, M., & Lathi, R. (2019). Hormonal imbalances and their Role in Female Infertility. *Endocrine Reviews*, 40(5), 576-586.
8. Ombelet, W., & Janssens, P. (2014). Artificial reproductive techniques and Their Future. *Fertility and Sterility*, 102(1), 10-19.