

# Infertility Women: Causes, Modern Diagnosis and Treatment Methods

**Ro'zmetova Roziyajon Yoqubboyevna**

*Tashkent Medical Academy, Termez Branch, Faculty of General Medicine, Group 310-A*

**Sevinch Rustamova Shuxrat qizi**

*Tashkent International University of Chemistry, Faculty of General Medicine, Group Med-01U*

**Izzatova Risolat Bahriddin qizi**

*Tashkent Medical Academy, Termez Branch, Faculty of Pediatrics, Group 104-A*

**Rasulov Asadbek Azizqulovich**

*Tashkent Medical Academy, Termez Branch, Faculty of General Medicine, Group 205-B*

Primary infertility: The woman has never been pregnant.

Secondary infertility: The woman was previously pregnant (even if pregnancy did not result in childbirth), but is no longer able to conceive.

Prevalence and Key Statistics:

According to the World Health Organization (WHO): Globally, 186 million people experience infertility. In 10–15% of married couples, pregnancy is delayed. In highly developed countries, 1–3% of children are born via IVF. Causes: The causes are divided into 5 main groups: 1. Ovulation disorders (approximately 30%). Mechanism: The egg cell does not mature or is not released. This is usually caused by hormonal imbalance. Most common conditions:

Polycystic Ovary Syndrome (PCOS):

The ovaries enlarge and contain many small follicles. The altered LH/FSH ratio stops ovulation. Hyperprolactinemia:

Elevated prolactin hormone causes hypoeestrogenism.

Thyroid disorders: Hypothyroidism or hyperthyroidism disrupts hormonal balance. Age-related ovarian reserve reduction: After age 35–40, the number of follicles decreases.

Signs: Irregular menstrual cycle. Complete cessation or infrequent menstruation.

2. Fallopian tube damage and adhesions (approximately 25%).

Causes:

Chronic infections:

Chlamydia, gonorrhea causing acute and chronic salpingitis Previous surgical procedures (appendectomy, pelvic surgery) Complications after ectopic pregnancy. Outcome: The egg and sperm do not meet. Diagnostics: Hysterosalpingography (HSG): visualizes tubes with contrast dye. Laparoscopy: the most precise method.

3. Endometriosis (approximately 10–15%).

Mechanism: Endometrial tissue grows outside the uterus (on the ovaries, pelvic organs). Bleeding and inflammation lead to adhesions. This interferes with sperm-egg interaction. Signs: Severe menstrual pain. Chronic pelvic pain.

4. Uterine pathologies (approximately 10%).

Causes: Submucosal fibroids (growing into the uterine cavity).

Uterine polyps. Congenital anomalies (septum, bicornuate uterus). Asherman's syndrome (intrauterine adhesions).

5. Idiopathic and other causes:

Idiopathic: All tests are normal, but pregnancy does not occur.

Immunological: Antisperm antibodies, antiphospholipid syndrome.

Genetic: Turner syndrome, Fragile X premutation.

Metabolic: Obesity, insulin resistance.

Diagnosis: Diagnosis must be comprehensive: Hormonal tests: FSH, LH, Estradiol, Prolactin, TSH.

Ultrasound: Assessment of ovarian and uterine structure; Folliculometry; Hysterosalpingography: Tubal patency evaluation. Laparoscopy: Detection of adhesions and endometriosis.

Genetic and immunologic analyses: Karyotyping; Antisperm antibodies;

Semen analysis: Assessment of male factor infertility.

Modern Treatment Methods: Treatment is tailored to the underlying cause and individualized:

1. Ovulation stimulation. Indications: Ovulation disorders.

Medications: Clomiphene citrate – 50–150 mg for 5 days, Letrozole (Femara) – for PCOS, Gonadotropins (FSH, LH injections), Metformin – in cases of insulin resistance.

Monitoring: Ultrasound folliculometry.

2. Intrauterine Insemination (IUI): Indications: Adequate sperm quality, patent tubes.

Procedure: Sperm is specially washed and concentrated; Introduced into the uterus during ovulation;

3. In Vitro Fertilization (IVF): Indications: Tubal obstruction; Severe endometriosis; Age >35 and failure of other treatments.

Steps:

1. Ovarian stimulation

2. Retrieval of matured follicles (puncture)

3. Fertilization in laboratory

4. Monitoring embryo development

5. Transfer into the uterus

Success rates:

Up to ~45–50% pregnancy before age 35

~15–20% after age 40

4. ICSI (Intracytoplasmic Sperm Injection):

Indications: Severe male factor infertility.

Procedure: A single sperm is injected directly into the egg

5. Laparoscopic Surgery: Indications: Endometriosis; Tubal adhesions; Small fibroids;

6. Hysteroscopic Treatment of Uterine Pathologies:

Removal of polyps, septum, submucosal fibroids Lifestyle and Psychological Support: Normalize body weight (BMI <25); Stop smoking and alcohol; Reduce stress (psychotherapy, meditation); Innovative and Experimental

Methods: PRP therapy (injecting autologous plasma into the ovaries); Donor oocytes (egg donation); Preimplantation genetic screening of embryos; Mitochondrial therapies;

Conclusion:

Infertility in women arises from multiple factors. Accurate diagnosis is crucial.

Treatment should be individualized. Thanks to modern technologies (IVF, ICSI), thousands of families are now able to have children. Infertility in women is a complex issue requiring a comprehensive, personalized approach. Timely diagnosis and the application of modern treatment methods can restore reproductive potential. The development of medical technologies means infertility is no longer an endpoint, but a process that can be overcome.

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