FEMALE INFERTILITY: MODERN METHODS OF DIAGNOSIS AND TREATMENT

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Abstract: This thesis reviews modern methods for the diagnosis and treatment of female infertility. It discusses the major causes of infertility, current diagnostic techniques, and contemporary treatment approaches. Early diagnosis and individualized treatment strategies play a crucial role in improving reproductive outcomes and increasing the likelihood of successful pregnancy.

Keywords: Female infertility, reproductive health, diagnosis, treatment, ovulation, hysteroscopy, laparoscopy, in vitro fertilization, assisted reproductive technologies.

Introduction

Female infertility is one of the most significant reproductive health problems worldwide, affecting millions of women of reproductive age. It is defined as the inability to achieve pregnancy after 12 months of regular unprotected sexual intercourse. The causes of female infertility are diverse and include ovulatory disorders, tubal abnormalities, endometriosis, uterine pathology, hormonal imbalance, genetic factors, and lifestyle-related conditions. Early identification of the underlying cause is essential for selecting the most appropriate treatment strategy and improving reproductive outcomes. Recent advances in reproductive medicine have considerably improved the diagnosis and management of female infertility. Modern diagnostic methods, including hormonal evaluation, transvaginal ultrasonography, hysterosalpingography, hysteroscopy, laparoscopy, and ovarian reserve assessment, enable accurate identification of reproductive disorders. In addition, assisted reproductive technologies such as intrauterine insemination and in vitro fertilization have significantly increased pregnancy success rates. Therefore, the application of modern diagnostic and therapeutic approaches plays a crucial role in improving fertility outcomes and enhancing the quality of reproductive healthcare.

Relevance

Female infertility is a growing global health problem that affects the physical, psychological, and social well-being of women. Advances in modern diagnostic methods and treatment technologies have improved the identification of infertility causes and increased the chances of successful pregnancy. Therefore, the use of contemporary approaches for the examination and treatment of female infertility remains highly relevant in modern reproductive medicine.

Main part

Female infertility is diagnosed through a comprehensive evaluation of reproductive function aimed at identifying the underlying cause of infertility. The diagnostic process begins with a detailed medical and reproductive history, including menstrual characteristics, previous pregnancies, gynecological diseases, surgical interventions, and lifestyle factors. Physical and gynecological examinations provide important information regarding anatomical abnormalities and reproductive health. Hormonal assessment plays a central role in evaluating ovarian function and includes measurements of follicle-stimulating hormone,

luteinizing hormone, estradiol, progesterone, prolactin, anti-Müllerian hormone, and thyroid hormones. Transvaginal ultrasonography is widely used to assess ovarian reserve, follicular development, uterine abnormalities, and endometrial thickness. Hysterosalpingography remains an important imaging technique for evaluating fallopian tube patency and uterine cavity abnormalities. Hysteroscopy and laparoscopy allow direct visualization of intrauterine and pelvic pathology, including endometriosis and pelvic adhesions. Comprehensive evaluation using modern diagnostic techniques enables accurate diagnosis and facilitates individualized treatment planning.

The management of female infertility depends on the identified cause and individual reproductive characteristics of each patient. Medical therapy is frequently used for hormonal disorders and ovulatory dysfunction. Ovulation induction with pharmacological agents improves the probability of natural conception in selected patients. Hormonal therapy is also indicated for endocrine disorders affecting fertility. Surgical treatment may be required to correct uterine abnormalities, remove endometrial polyps, treat uterine fibroids, eliminate pelvic adhesions, or manage endometriosis. Minimally invasive laparoscopic and hysteroscopic procedures have significantly improved reproductive outcomes while reducing postoperative complications. Assisted reproductive technologies represent the most advanced therapeutic option for couples experiencing infertility. Intrauterine insemination and in vitro fertilization have substantially increased pregnancy success rates in patients with tubal disease, severe endometriosis, diminished ovarian reserve, and unexplained infertility. Individualized treatment strategies based on comprehensive diagnostic evaluation provide the highest probability of successful pregnancy.

Early diagnosis and timely treatment are essential for improving reproductive outcomes and preventing long-term complications associated with infertility. Delayed diagnosis may result in progressive reproductive dysfunction and reduced treatment success, particularly with increasing maternal age. Modern diagnostic technologies facilitate early identification of reproductive disorders before irreversible damage occurs. Individualized management based on the underlying etiology significantly increases the likelihood of conception while minimizing unnecessary interventions. Psychological counseling and emotional support also play an important role because infertility is frequently associated with anxiety, depression, and reduced quality of life. Multidisciplinary collaboration among gynecologists, reproductive endocrinologists, embryologists, and other healthcare professionals contributes to comprehensive patient care. Continuous advances in reproductive medicine continue to improve pregnancy rates and provide new therapeutic opportunities for women with infertility. Therefore, early diagnosis, evidence-based treatment, and individualized reproductive care remain the cornerstone of successful infertility management.

Conclusion

Female infertility remains one of the most important challenges in modern reproductive medicine. Early diagnosis using comprehensive clinical, laboratory, and imaging methods enables accurate identification of the underlying causes of infertility and facilitates individualized treatment planning. Contemporary therapeutic approaches, including medical treatment, minimally invasive surgery, and assisted reproductive technologies, have significantly improved pregnancy outcomes and reproductive success. Therefore, the integration of modern diagnostic techniques with evidence-based treatment strategies plays a key role in restoring fertility and improving the quality of life of women affected by infertility.

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