

# Exploring the thought of TCM prevention and treatment of small follicle ovulatory infertility from the theory of spleen and stomach

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**Abstract:** Small follicle ovulation is an abnormal ovulation pattern, which is often clinically manifested as ovulation occurs when the most dominant follicle is immature, and is classified as a type of ovulation disorder or follicular dysplasia syndrome. Chinese medicine believes that the spleen and stomach are "the source of qi and blood biochemistry, and the foundation of the day after tomorrow". The spleen and stomach take the function of transporting and transforming as the core, combining the innate essence from the two aspects of transporting and transforming water and grain, and transporting and transforming water and dampness, to provide the necessary subtle substances for the development of follicles and endometrium. The theory of the spleen and stomach is applied throughout the whole stage of the treatment of ovulatory infertility with small follicles, focusing on the influence of acquired factors on the function of the hypothalamus, regulating the spleen and stomach so that the whole body qi movement is normal, the function of the hypothalamic axis is normal, and the qi and blood of body fluids. On this basis, focus on tonifying kidney qi, regulating yin and yang, so as to achieve balance, uterine storage and diarrhea, improve endometrial receptivity, regulate the entire internal environment of the body, and promote "shen qi-tianguai" -Chongren-uterus" reproductive axis (ie "hypothalamus-pituitary-ovarian axis") functions normally, improves the body's endocrine, promotes the development and maturation of follicles and helps to conceive, which has positive clinical significance. Case 1 is attached as evidence.

**Keywords:** Spleen and stomach theory; small follicle ovulation; infertility; Chinese medicine prevention and treatment ideas

Small follicle ovulation refers to an abnormal ovulation pattern in which the largest dominant follicle has not yet reached the mature stage (average diameter, <18mm), and is classified as a ovulatory disorder or follicular dysplasia syndrome [1]. Small follicles after ovulation can lead to low fertilization ability of egg cells and decreased embryo quality, and the spontaneous abortion rate increases [2]. According to statistics, small follicle ovulation accounts for 16.7% of infertility patients and 64.8% of unexplained infertility patients, which is one of the important causes of clinical infertility [3]. At present, the pathogenesis of small follicle ovulation in Western medicine has not yet been fully clarified, and its main influencing factors include hormones, cytokines, genes, and signaling pathways [4]. Clinically, it is more common in hypothalamus, hypopituitary amenorrhea, hyperprolactinemia, polycystic ovary syndrome, premature ovarian failure, ovarian insensitivity syndrome and other diseases.

## 1. The etiology and pathogenesis of small follicle ovulation

### 1.1 Knowledge of TCM

There is no specific name for small follicle ovulation in traditional Chinese medicine, and there is no relevant record about "small follicle ovulation". However, Chinese medicine believes that most of the related diseases such as abnormal follicle development have something in common with "low menstrual flow", "no child", "uneasy fetal movement", "abortion" and "slippery baby". The main causes of female infertility are mainly kidney deficiency, and the pathogenesis can be seen in spleen deficiency, liver

depression, lack of nourishment of mind and spirit, qi and blood and imbalance of Chong and Ren. It is also related to pathological factors such as blood stasis and phlegm dampness. "Simple Questions: The Ancient Innocent Theory" states: "A woman is seven years old, her kidney qi is prosperous, her teeth are longer, and a woman is twenty-seven, when Tiangui arrives, Ren Maitong, Taichong pulse is strong, and the menstrual period is now and then, so there is a child... The Qiqi Ren pulse is deficient, the Taichong pulse is less attenuated, the Tian Gui is exhausted, and the tunnel is blocked, so the shape is broken and there is no child." The kidney is the foundation of the innate, the kidney stores the essence and controls reproduction, the kidney essence is sufficient, and the kidney qi is vigorous, then the "Tiangui" arrives, and the tongs are full, and the menstrual cramps come on time, so that the child can be born. "Nu Ke Jinglun Shiyumen": "A man's fetus is bred, and the yang essence is given, and the yin and blood can absorb it, the essence becomes his son, the blood becomes his spore, and the fetus is conceived. Today, women have no children. The lack of blood is not enough to take in the essence... thin women, irritable and fiery, irregular menstrual water, unable to conceive." The spleen controls the transportation and transformation, is the source of the biochemical qi and blood, and is the foundation of the day after tomorrow. The power of domination. If the body is weak, or eating improperly, or being tired or thinking too much, it can lead to spleen deficiency and infertility. "Women take the liver as their innate" and "take the blood as the foundation". The liver and the kidney are of the same origin, and the essence and blood are alternately produced. The two are physiologically related to each other, and together they maintain the entire process of reproduction and gestation. The heart stores the spirit, controls the blood vessels, and the activities of the heart are directly related to the sealing of the kidney essence. When the heart qi flows down to the kidneys, and the heart and kidneys intersect, the blood vessels flow smoothly and menstruation is normal. If the organs such as the kidney, liver, spleen and heart malfunction, or the pathogens of cold, dampness and heat invade, the Qi and blood of the Chong and Ren meridians are out of balance, and the phlegm coagulates and stasis, the kidney-Tiangui-Chongren-uterine reproductive axis cannot function normally, resulting in menstrual disorders and ovulation. dysfunction, which in turn leads to infertility.

### ***1.2 Understanding of Western Medicine***

A newborn is born with about 2 million follicles in the ovary. Most follicles degenerate in childhood, and only about 300,000 remain in puberty. After puberty, the process of follicle development from autonomous development to maturity depends on the stimulation of gonadotropins. A batch of follicles develop every month during the reproductive period, but generally only one dominant follicle matures and ovulates, and the rest of the follicles develop to a certain stage and degenerate by themselves through the mechanism of apoptosis, which is called follicular atresia. In a woman's lifetime, only 400 to 500 egg cells can develop to maturity and ovulate, accounting for only about 0.1% of the total.

The development and maturation of follicles go through several stages of primordial follicles, preantral follicles, antral follicles and mature follicles.

Typically, after 1 week of the fourth menstrual cycle of follicle development, only 1 follicle continues to develop, called the dominant follicle. The follicular development disorder in patients with follicular dysplasia occurs in the process of further development after the selection and dominance of the dominant follicle [5]. The occurrence of small follicle ovulation is due to the incoordination of some or some links on the hypothalamus-pituitary-ovarian axis, which affects the development of follicles, so that the average diameter of the follicles does not develop to 18mm before LH peak occurs, and ovulation occurs. In the normal menstrual cycle of women, with the gradual development of follicles, the body's estrogen secretion increases, while the pituitary secretion of follicle-stimulating hormone (FSH) decreases. At this stage, only the dominant follicle has strong estrogen secretion ability and high sensitivity to FSH, so it can continue to develop into a mature follicle. Other follicles do not have this property and eventually stop developing due to lack of sufficient FSH, that is, follicular atresia. Therefore, estrogen is an indispensable regulator of follicle growth and maturation. Relevant studies have shown that insufficient secretion of follicle-stimulating hormone (FSH) and estradiol (E2) may be one of the important reasons for abnormal follicle development [6]. FSH can regulate the selection and development of dominant follicles and the atresia of non-dominant follicles, while luteinizing hormone (LH) plays a very important role in follicle development, egg maturation and ovulation. When the ratio is too low or the ratio is abnormal, it will cause abnormal follicle development and ovulation disorders, resulting in small follicle ovulation.

## 2. Spleen and Stomach Theory

### 2.1 *The book of the day after tomorrow*

The theory of the spleen and stomach was first recorded in the "Huangdi Neijing". "Simple Questions: Meridians and Vessels" states: "Eat qi enters the stomach, disperses essence in the liver, and stagnates qi in the tendons. Eating qi enters the stomach, turbid qi returns to the heart, and stagnation and essence go to the pulse. Hundred pulses, insemination of sperm in the fur. The hair pulses are combined with the essence, and the qi flows in the house. The house spirit is bright, and it stays in the four stores. Essence and qi are transported up to the spleen, spleen and spleen dissipate essence, up to the lungs, to regulate the water channels, and down to the bladder, the water and essence are distributed in four, and the five meridians run in parallel" [7]. The spleen is located in the abdomen and is connected to the stomach. Its main function is to transport and transform blood, and the spleen controls the transport and transformation of food and water. The main function of the stomach is to accept decomposed grains. Food comes from the mouth, and is transformed into water and grain essence through the spleen, and transported to the whole body, nourishing the internal organs, limbs and bones, and at the same time replenishing the innate essence, promoting the growth and development of the human body, so the spleen is called "the foundation of the future". . . As the representative of the six fu-organs involved in digestion and absorption, the stomach should also include the stomach. Therefore, the spleen and stomach are often referred to as "the foundation of the day after tomorrow". "The spleen and stomach are the foundation of acquired", which can nourish qi and blood, nourish the zang-fu organs, and at the same time, the spleen and stomach belong to the earth. The mutual restriction and coordination can maintain the normal functioning of the five internal organs [8].

### 2.2 *The theoretical basis of the spleen and stomach theory in female infertility*

The pathogenesis of female infertility is complex and the etiology is diverse. The development and maturity of female reproductive function not only depends on the congenital kidney and Tiangui, but also on the nourishment of the acquired spleen and stomach. The spleen and stomach are strong and the qi and blood are biochemically active, so as to provide a certain material basis for the meridians, belts, fetuses and milk. Therefore, there is a saying that "a woman's meridian water and milk are both produced by the spleen and stomach". Gynecological diseases are closely related to the viscera of the whole body, and the viscera depends on the nourishment of the spleen and stomach, which shows the importance of the function of the spleen and stomach[9]. Chinese medicine believes that the cause of infertility is nothing more than congenital underdevelopment, or acquired disorders. Primary infertility is mostly caused by congenital insufficiency of kidney qi, deficiency of yin and blood, deficiency of Chong and Ren, dystrophy of cell veins, inability to absorb sperm and become pregnant, or due to poor emotion, stagnation of liver qi, disorder of stagnation and spleen, liver stagnation and spleen deficiency , Chong and Ren disorders lead to infertility. Or infertility is caused by women who usually eat too much raw and cold, feel cold evil, and have a cold uterus. Secondary infertility is mostly caused by postpartum, abortion or spontaneous abortion, inadvertent diet and daily life, re-infection of exogenous pathogens, damage to Chongren and block qi, or phlegm-dampness caused by eating fat, sweet and thick flavors, and phlegm-dampness becomes stasis over time , The phlegm and blood stasis are cemented, and the cell veins are blocked, which leads to infertility. Therefore, dysfunction of the spleen and stomach is an important factor causing a series of infertility [10]. Fu Qingzhu believes that the spleen and stomach are the foundation of the day after tomorrow. The spleen rises and the stomach descends to regulate the whole body's qi mechanism, which can make the blood biochemically sufficient, the qi mechanism unobstructed, the uterus harmonized, and the seeds and embryos can be bred smoothly [11]. Chen Ziming's "Women's Complete Recipe" said: "Qi and blood are the gods of people, and women are based on blood." "Simple Questions: Meridians and Vessels" says: "Eat qi enters the stomach, escapes essence qi, and loses it to the spleen, and the spleen dissipates essence". Therefore, the spleen and stomach are invigorated, and the congenital essence in the kidney is prosperous.

## 3. Theoretical basis for treating small follicle ovulation from the spleen and stomach

According to traditional Chinese medicine, the spleen and stomach have the physiological functions of controlling transportation and transformation, ascending and controlling blood. The spleen and stomach govern the transportation and transformation, and through the transportation and transformation of water and grains, they provide subtle substances for the body's life activities, also known as "the source

of qi and blood biochemistry". The main transportation and transformation includes two aspects: transportation and transformation of water and grains, and transportation and transformation of water and wetness. These two aspects are also important factors that affect the ovulation of small follicles. On the one hand, the kidney is the innate foundation, and the nourishment of kidney essence and the promotion of kidney qi play an important role in the growth and development of follicles, and the acquired essence stored in the kidney actually depends on the spleen to transport and transform water and grains. keep. The congenital essence and the acquired water grain provide the necessary subtle substances for the development of follicles and endometrium. If the spleen and stomach are usually weak, the spleen is damaged by eating and drinking, the spleen and the spleen are deficient due to liver stagnation, or the kidney yang deficiency causes the spleen and earth to lose warmth, resulting in the loss of spleen transport, the inability of water and grain to be distributed throughout the body, the lack of biochemical sources of qi and blood, and the empty sea of blood. Unbalanced, unable to nourish follicles, resulting in follicular dysplasia, prone to flat follicles, small follicles and immature follicles. On the other hand, if the spleen fails to function properly, it cannot transport and transform water-dampness, the water-dampness stops within, and accumulates to form phlegm. The internal resistance of phlegm-dampness hinders the circulation of qi and blood, which further leads to stagnation of qi and blood stasis. The dysfunction of the follicles will cause the follicles to lose their nourishment, unable to grow and develop normally, or unable to ovulate on time, making it difficult to absorb sperm and become pregnant, and the menstrual water cannot be timely, which will also cause the occurrence of small follicles and ovulation, which will lead to irregular menstruation. Infertility.

#### **4. Treatment principles and directions of treating small follicle ovulation from the perspective of spleen and stomach**

The theory of traditional Chinese medicine believes that the spleen and stomach are the foundation of the day after tomorrow, so the dysfunction of the spleen and stomach is one of the important reasons for the occurrence of diseases. Therefore, the treatment of gynecological diseases from the perspective of the spleen and stomach is particularly critical in the syndrome and treatment. Qing Ye Tianshi's "Secret Seed Golden Elixir" states: "The disease is related to the fetus, the man is in the essence, the woman is in the blood, it is nothing but a deficiency" [15]. The kidney is the foundation of the innate, the main storage; the spleen is the foundation of the acquired, the main transportation and transformation of water and grains, and the transformation of qi and blood. Essence can generate blood, blood can transform essence, and the essence and blood can breed and promote each other, and the primordial follicles can gradually develop into antral follicles. Moreover, the innate warm yang stimulates the acquired, and the acquired supplements the cultivation of the innate, so kidney deficiency can cause spleen deficiency, and spleen deficiency can also lead to kidney deficiency. Therefore, in the process of diagnosis and treatment, the theory of "heavy spleen and stomach" should be run through it.

##### (1) Treatment by stages

On the basis of the acquired foundation of the heavy spleen and stomach, according to the characteristics of follicular development, treating both the symptoms and the actual situation, it is divided into the follicular phase, the ovulation phase and the luteal phase for treatment by stages.

##### 1) Follicular phase

The development of follicles requires the nourishment of qi and blood. The kidney is the innate foundation, and the main storage is the spleen. Essence can produce blood, and blood can transform semen. Essence and blood multiply and promote the development and maturity of follicles. Congenital stimulates the acquired, and the acquired nourishes the congenital, kidney deficiency can lead to spleen deficiency, and spleen deficiency can also lead to kidney deficiency. The kidney essence is determined by genetic factors, and it is difficult to change in a short period of time. Therefore, the innate essence can be improved by tonifying the spleen and stomach. Li Dongyuan's "Spleen and Stomach Theory" stated that "the spleen and stomach are not damaged by the qi of the spleen and stomach, and then nourish the vitality". Therefore, in the follicular phase, we should pay attention to the spleen and stomach while invigorating the kidney. Atractylodes, white ginseng and other products to strengthen the spleen and Qi [16].

##### 2) Ovulation period

Traditional Chinese medicine believes that yang is mainly responsible for elevating the powder and improving the function. Medicines for nourishing heat and yang can excite the hypothalamus and

pituitary gland, strengthen the function of the hypothalamus and pituitary gland, promote the secretion of LH and FSH, and can improve the blood supply of the ovary and uterus, and provide nutrients for the development of follicles. and Tiangui substances (LH, FSH), thereby promoting the growth and maturation of follicles, and the increase of follicle mature E2 forms a positive feedback, which promotes ovulation of mature follicles [17]. The functions of warming yang and tonifying the kidney, strengthening the spleen and nourishing qi mainly promote the dispersing and the outward function, and can also promote the mature follicles to move to the surface of the ovary to form egg cones, thereby promoting ovulation. At this stage, attention should be paid to astragalus, Cistanche deserticola, Xianlingpi, Tuduan, Eucommia, Mulberry and other spleen-boosting herbs.

### 3) Luteal phase

The luteal phase, also known as the secretory phase, is 15 to 28 days of the menstrual cycle. At this point the ovary has ovulated and the corpus luteum is formed.

During the luteal phase, yang rises and yin grows to achieve a new balance. It is advisable to give equal attention to yin and yang, supplement both qi and blood, maintain the normal function of the corpus luteum, promote the implantation of fertilized eggs, and facilitate the rooting and germination of seeds. In this period, white peony root and angelica are used to nourish blood and blood, plus astragalus to nourish qi and invigorate the spleen, and Xianlingpi, cistanche and dodder adjust the balance of yin and yang in the kidney [18].

## 5. Examples of case verification

Cao Mou, female, 27 years old, was first diagnosed on December 20, 2019.

Chief Complaint: The patient has not used contraception for 2 years, menarche at the age of 12, usually menstrual period is 7/25 to 30 days, the menstrual volume is light, the color is light red, the texture is sticky, and a small amount of blood clots, LMP: 2019-12-18, the first menstrual cycle 3 days, the waist is sore and uncomfortable before menstruation, mild dysmenorrhea, sleepless, loose stools, pale tongue, greasy coating, slippery pulse. Height 163cm, weight 60kg. Auxiliary examination: six sex hormones: follicle-stimulating hormone (FSH) 5.42mIU/mL, luteinizing hormone (LH) 4.45mIU/mL, estradiol (E2) 48pmol/L, prolactin (PRL) 23.18mIU/L, progesterone (P) 0.20nmol/L, testosterone (T) 0.67nmol/L; B-ultrasound showed: endometrial thickness 0.7cm, both ovaries have 12 0.5cm follicles. Western medicine diagnosis: primary infertility, irregular menstruation, polycystic ovary syndrome; Chinese medicine diagnosis: late menstruation. Dialectical: The spleen and kidney are weak, and the spleen loses its health. Governing Law: invigorating the spleen and kidney, expelling water and resolving phlegm. Prescription: Add or subtract 7 payments for brewing for menstrual adjustment drink. Recipe composition: ginseng 9g, astragalus 20g, dodder 20g, atracylodes 12g, broccoli 12g, mulberry parasitic 12g, Polygonatum 12g, angelica 6g, tuckahoe 12g, coix seed 20g, licorice 6g, decocted with water, take twice in the morning and evening, total 7 doses.

On the second visit on December 29, 2019, on the 12th day of the menstrual cycle, after taking 7 doses of the medicine, the loose stools improved significantly. B-ultrasound showed that the thickness of the endometrium was 0.7cm, and the maximum left follicle was 1.8x1.6m. Supplementary diagnosis: small follicle Ovulation. Governing method: warming yang and invigorating the kidney, strengthening the spleen and nourishing qi, prescription: bufeicuhuang decoction plus or minus 7 pays. Based on the original recipe, 30g of Dodder, 12g of Xianlingpi, 12g of Cistanche deserticola, 15g of Eucommia ulmoides, and 12g of Golden Retriever ridge. 7 doses, simmer in water.

On January 7, 2020, the third visit, on the 20th day of the menstrual cycle, after taking 7 doses in a row, B-ultrasound showed: the dominant follicle was obviously shrunk, the edge of the follicle was blurred, the shape was irregular, there were sparse dot-like echoes in it, and the uterus and rectum were sunken. A little fluid retention. Prescription: Promoting Huang Tiaoqing Drink plus or minus 7 pays. Recipe composition: medlar 10g, dodder 30g, antler cream 10g, eucommia 12g, angelica 12g, cinnamon 6g, white peony root 12g, rehmannia 12g, cistanche 10g, codonopsis 12g, xianlingpi 12g, and Morinda officinalis 12g. 7 doses, decoct in water, stop when menstruation arrives. Menstruation to January 20th. Afterwards, 3 cycles of recuperation were carried out according to this cycle, and the blood HCG was tested positive on May 27, 2020.

Press: The patient has less menstrual flow, loose stools, backache and discomfort during menstruation, pale and fat tongue, and white and greasy coating. The card is spleen and kidney deficiency. The patient's first visit is during the menstrual period. At this time, attention should be paid to the development of

follicles. In terms of treatment, we should pay attention to the acquired essence of the spleen and stomach while supplementing the congenital essence. The purpose of promoting follicle development. At the same time, the patient had loose stools, pale and fat tongue, white and greasy coating, and weak spleen-yang. In addition, the spleen-tonifying and yang-warming medicines significantly relieved the accompanying symptoms. The B-ultrasound showed that the follicles were immature but ovulated at the second visit, so the supplementary diagnosis of ovulation with small follicles was made. On the basis of the above, add more herbs for warming yang and invigorating the kidney, invigorating the spleen and replenishing qi to promote the development and ovulation of mature follicles. The third diagnosis is in the luteal phase. On the basis of cultivating the spleen and kidney, add yang-warming products such as Xian Lingpi, *Morinda officinalis*, cinnamon, etc., to promote the development of follicles. Taking this as a cycle, cycle treatment and assisted pregnancy are carried out, and ultimately help patients get pregnant successfully.

## 6. Conclusion

The theory of the spleen and stomach is applied throughout the whole stage of the treatment of ovulatory infertility with small follicles, focusing on the influence of acquired factors on the function of the hypothalamus, regulating the spleen and stomach so that the whole body qi movement is normal, the function of the hypothalamic axis is normal, and the qi and blood of body fluids. On this basis, focus on tonifying kidney qi, regulating yin and yang, so as to achieve balance, uterine storage and diarrhea, improve endometrial receptivity, regulate the entire internal environment of the body, and promote "shen qi-tianguai" -Chongren-uterus" reproductive axis (ie "hypothalamus-pituitary-ovarian axis") functions normally, improves the body's endocrine, promotes the development and maturation of follicles and helps to conceive, which has positive clinical significance.

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