

Comprehensive Treatment of Polycystic Ovarian Syndrome and Related Infertility

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Abstract: Polycystic ovarian syndrome (PCOS) is one of the most common gynaecological and endocrinal disorder amongst women. It affects not only the women's menstrual cycle, but also with the subsequent problems of anovulation and infertility. To be able to treat PCOS and its related infertility effectively, precise early diagnosis is rather important. In the article, I will discuss every aspects of the comprehensive treatment of PCOS, which include conventional Western medicine perspective, traditional Chinese medicine (TCM) theory and dietary therapy. Illustrated by three case studies, I will also analyse the TCM aetiology and pathology, pattern differentiation and individualised treatment protocol.

Key Words: Polycystic Ovarian Syndrome (PCOS), Infertility, Traditional Chinese medicine (TCM), Acupuncture, Western medicine (WM), Dietary therapy.

Introduction

The definition of PCOS in Western medicine has been much debated. However, it is generally defined as a disorder of ovulation, which the key features include menstrual cycle disturbance, hyperandrogenism and obesity. There are many extra-ovarian aspects to the pathophysiology of PCOS. It is recognised that affected 20-33% of the UK female population and 5-10% of women across the world, and is the most common cause of anovulatory infertility^[1, 2].

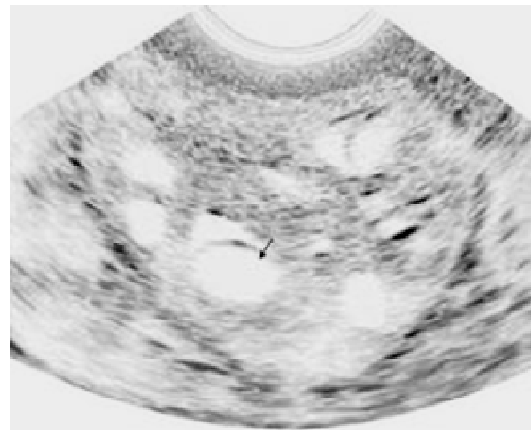
Due to the impaired metabolic and endocrine functions in PCOS, 90% of women with PCOS suffering from irregular menstrual cycles or absent periods^[2], and 50-70% of women have insulin resistance, which may further raises the risk of developing diabetes, endometrial cancer, high blood pressure, high cholesterol, and cardiovascular disease^[3]. Getting symptoms controlled as soon as possible can decrease a woman's chance of developing any of these other conditions.

Western Medicine View

1. Natural ovulation process

Ovaries are two organs on each side of the women's uterus which contain follicles. Each month approximately twenty follicles (eggs) start to mature, but usually only one egg fully matures, when the fully mature egg is ready, the follicle breaks open to release it. The egg then travels through fallopian tube to uterus for fertilization and implantation.

This natural ovulation process depends on optimal function of the sexual hormonal axis, which comprises the hypothalamus, pituitary and ovaries (HPO). The hypothalamus produces gonadotropin releasing hormone (GnRH), which stimulates the pituitary gland to release follicle stimulating hormone (FSH) and luteinising hormone (LH). FSH stimulates the growth of small follicle sacs in the ovaries, while LH supports FSH to ripen the eggs and release a mature egg eventually.

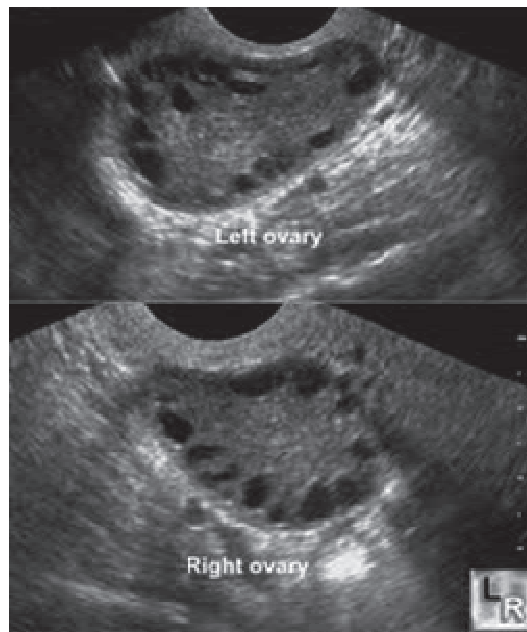


(Ultrasound image of normal ovary)

2. The causes of PCOS and infertility

PCOS is a controversial condition in WM. It is believed that in 25% of women with PCOS is an inherited disorder^[4], endocrine malfunction and environmental factors may also playing a part in the development of PCOS. The majority of women with PCOS have insulin resistance, and the elevated insulin levels contribute or cause the abnormalities seen in the HPO axis that lead to PCOS.

In women with PCOS, the ovaries are much larger than average with multiple rows of cysts, covered with a thick, slimy, waxy or hard outer coating. These small cysts produce male hormone called androgen. Androgens block follicular development and cause the follicles to degenerate, preventing the release of mature eggs. Androgens can also alter the feedback mechanism within the HPO axis. The overproduction of oestrogen can then cause decreased FSH level and increased production of LH (this is the reason that many women with PCOS still get LH surge when they use an ovulation predictor test) and testosterone. Because of this hormonal cascade, the state of the endometrium is affected and ovulation is prevented, therefore there is no egg released for fertilization and implantation in the uterus, of course no conception would be achieved.



(Ultrasound images of PCOS ovaries)

3. Clinical manifestations

PCOS is considered a syndrome because it has a number of unrelated symptoms, it often occurs with one or more of the following factor:

- Dysfunctional uterine bleeding: up to 90% of women with PCOS experiencing irregular menstruation [2]. It is possible to have either very long menstrual cycles with very heavy bleeding, or short menstrual cycles with light bleeding, or even amenorrhea. The menstrual blood contains stringy tissue or mucus, or even watery blood.
- Anovulatory infertility: approximately 74% of women with PCOS have anovulatory infertility [4], they may still have regular period, but no ovulation in the middle of the cycle, or if an egg is released, it is often later in a woman's cycle and it is of poorer quality.
- Recurrent miscarriage: due to poor quality of egg and over stimulation of endometrium, the fertilized egg (if any) is prevented to implanting in the uterus, and cause infertility and miscarriage.
- Hirsutism and/or acne: up to 83% of women with PCOS have heavy hair growth, cystic or pustular acne [5].
- Obesity: 50% of women with PCOS are over weight [5], their BMI (Body Mass Index) is over 25.
- Ultrasound-scan showing enlarged ovaries with multiple cysts (immature follicles).
- Blood tests: increased LH and testosterone levels, LH / FSH ratio > 3, elevated prolactin level, imbalances in sugar metabolism and insulin levels.

4. Western medicine treatment

- Birth control pills: can help regulate menstrual cycles,

lower level of androgen, reducing abnormal hair growth and improve acne. It is suitable for women who have irregular period with very heavy bleeding, but are not trying to conceive. However, symptoms can return if a woman stops taking the pills, and this should not be the option for women trying to conceive.

- Fertility medications: Clomiphene citrate (Clomid) to promote ovulation; FSH, such as Gonal-F, Manopur or Puregon to reduce LH level, decrease LH/FSH ratio, correct the biochemical imbalance, improve ovarian function.
- Human chorionic Gonadotropin (HCG) to help maturing eggs, and to induce ovulation (release the eggs).
- Diabetes medications: Metformin, Yasmin or Provera to control insulin and blood sugar level, regulate the production of male hormones, improve the regularity of menstrual cycles.
- Steroids: to balance the androgen hormonal effects, to treat excess or unwanted hair growth and acne. However, over the long term, it can cause liver damage and a reduction of bone density.
- Healthy weight: Maintaining a healthy weight is also a way to manage PCOS. A healthy diet and exercise can lose weight, help the body to use insulin more effectively, lower glucose levels, and help regulate menstruation.
- Surgically eliminate follicular cysts: A small portion of the ovary is destroyed by a laparoscopic procedure – laser ovarian drilling (in which a small electric current is applied to the ovary) may be considered, which can decrease the production of male hormones and increase ovulation. It will not help with excessive hair growth and also carries the risk of scar tissue forming on the ovaries. Normally, results only last a few months, and then the symptoms return.
- If all of these fail, IUI or IVF may be recommended. However, most women with PCOS don't respond well to any hormonal manipulation that does not address both the health of eggs and the state of ovarian endocrine balance, which may hyper-stimulate the ovaries and create a multitude of side effects, ovarian hyper-stimulation syndrome (OHSS) is one of the most common and severe condition we often seen clinically. Even if a woman's body forced to ovulate with these artificial follicle stimulating drugs, the quality of eggs may be poor. If this woman does become pregnant, consequently, she has a higher risk of miscarriage.

TCM Perspective of PCOS

1. TCM Aetiology and Pathology

PCOS is classified as amenorrhoea or scanty periods, abdominal masses and/or infertility in terms of TCM. Clinically PCOS is seen as more of a combination of both an excess and deficient condition. The most involved organ systems include Spleen, Kidney and Liver with a

subsequent disharmony of Chong and Ren channels. PCOS generally derives from a deficiency of Kidney Yang and Spleen Qi, in its inability to transform, transport and evaporate fluids in the lower burner. The accumulation of water in the pelvic cavity enlarges the ovaries, leading to phlegm-damp and/or blood stagnation, which manifests as abdominal masses.

1.1 *Kidney Deficiency, Disharmony of Chong and Ren Channels*

Due to constitutional kidney qi deficiency, or prolonged illness, or excessive sexual activity, or long term intake of oral contraceptive pills, all of these factors can affect the kidney function and result in the depletion of kidney yin or/and kidney yang, lead to failure of dominating body fluid and warming uterus, and poor nourishment of chong and ren channels. Therefore the uterus unable to get adequate blood flow, causing prolonged menstrual cycle with scanty bleeding or amenorrhea occurs.

1.2 *Spleen Qi Deficiency, Accumulation of Phlegm and Damp in the Uterus*

Over consumption of greasy, fatty and sugary foods, dairy products and alcohol; or extreme worry and excessive physical work may impair the function of spleen, cause failure of transporting fluid and food into useable energy. Accumulated body fluid then transforms into damp and phlegm, obstructs the qi and blood flow in the uterus, and blocks the chong and ren channels. Consequently, uterus and ovaries are starved of blood supply, leading to irregular and scanty period, or even amenorrhea and infertility.

1.3 *Liver Qi Stagnation and Blood stasis*

Enduring stress, depression or anxiety may lead to internal impairment of seven emotions, then cause liver qi stagnation and blood stasis; or invasion of pathogenic wind and cold, together with excessive consumption of cold foods and drinks, may congeal blood and cause blood stasis, obstructs the chong and ren channels, prevents menstruating and therefore amenorrhea. Nevertheless, long term liver qi stagnation could eventually transform into heat, or excessive pathogenic heat invasion exhausts the kidney yin and blood, and then causes irregular periods, or heavy and clotty bleeding.

2. *Pattern Differentiations and Treatment*

TCM seeks to readdress the entire hormonal environment that produces the changes in a woman's ovaries seen in PCOS, promote ovulation, improve eggs quality and support conception, and prevent miscarriage if a pregnancy achieved.

2.1 *Deficiency of Spleen Qi and Kidney Yang, Accumulation of Phlegm and Damp*

Clinical manifestations:

Prolonged menstrual cycle with scanty bleeding, which contains stringy tissue or mucus or even watery blood, or amenorrhea, or infertility, accompanying with lower back pain, bloated stomach, aversion of cold, fatigue, over weight, heavy facial and body hair, prone to vaginal thrush. Pale and swollen tongue with teeth marks, white and greasy coating, deep and fine pulses.

Treatment plan:

Warm up kidney yang and strengthen spleen qi, remove dampness and resolve phlegm.

Patent herbs:

Combine Yougui wan or Nuangong yuzi wan with Guizhi fuling wan or Renshen jianpi wan.

Herbal prescription:

Tusizi, Yinyanghuo, Shudihuang, Shanzhuyu, Guizhi, Fuling, Dangshen, Cangzhu, Banxia, Xiangfu, Zaojiaoci, Zhebeimu, Shanzha.

2.2 *Deficiency of Kidney Yin and Blood, Liver Qi stagnation*

Clinical manifestations:

Irregular menstrual periods which can be prolonged cycle, or normal cycle with light bleeding, or even amenorrhea, severe PMT, depression, restlessness, headache or dizziness, disturbed sleep, night sweat, acne, and infertility. Red tongue with thin coating, wiry and fine pulses.

Treatment plan:

Nourish kidney yin and blood, soothe liver qi and unblock the chong and ren channels.

Patent herbs:

Combine Zuoguiwan or Fuke Yangrong wan, with Jiawei xiaoyao wan or Chaihu shugan wan.

Herbal prescription:

Shanyao, Shanzhuyu, Mudanpi, Nuzhenzi, Hanliancao, Gouqizi, Danggui, Baishaoyao, Chongweizi, Maidong, Shengdihuang, Xiangfu, Chaihu.

2.3 *Blood Stasis, Phlegm and Heat, Blockage of Chong and Ren Channels*

Clinical manifestations:

Very irregular menstrual cycle with no pattern at all, scanty bleeding with clots, or amenorrhea, although may flooding sometimes, infertility, distension of chest and breasts, bloated stomach and cramp pain in the lower abdomen, severe acne, heavy body and facial hair, thirsty, constipation and over weight. Dark red or purple red tongue with black spots around the edge, white or yellow greasy coating; wiry, slippery and rapid pulses.

Treatment plan:

Clear heat and remove phlegm, motivate blood and resolve blood stasis.

Patent herbs:

Combine Xuefu zhuyu wan or Fuke tiaojing wan, with Chaihu shugan Wan or Qingqi Huatan Wan.

Herbal prescription:

Taoren, Danshen, Danggui, Chuanxiong, Fuling, Mudanpi, Chishaoyao, Xiangfu, Zhike, Chongweizi, Zaojiaoci, Xiakucao, Haizao, Zhebeimu.

3. *Acupuncture*

For complicated cases with multiple patterns, an artificial menstrual regulatory treatment with herbal medicine and acupuncture may be applied.

Commonly used points:

Baihui (Du20), Tianshu (St25), Guilai (St29), Zhongji (Ren3);

Moxibustion on Guanyuan (Ren4), Qihai (Ren6) and Shenque (Ren8);

Electro-acupuncture: Shenshu (UB23), Ciliao (UB32), Zhishi (UB52).

Modification of points:

- 1) For strengthening spleen qi: Zusanli (St36), Xuehai (Sp10), Fenglong (St40), Yinlingquan (Sp9), Sanyinjiao (Sp6), Pishu (UB20).
- 2) For warming kidney yang: Shenshu (UB23), Dachangshu (UB 25), Mingmen (Du 4), Yaoyangguan (Du3), Fuli (Ki7), Zhaohai (Ki6).
- 3) For nourishing kidney yin: Shenshu (UB23), Taixi (Ki3), Sanyinjiao (Sp6), Neiguan (Pc6).
- 4) For soothing liver Qi and resolving blood stasis: Geshu (UB17), Ganshu (UB18), Waiguan (Sj5), Hegu (Li4), Sanyinjiao (Sp6), Taichong (Liv3), Zulinqi (GB41).

4. Dietary Therapy

Most women with PCOS have endocrine abnormalities affected by diet, lose weight can help treat PCOS. Fat cells store estrogen, and usually there is relatively too much circulating estrogen and LH, Liver metabolizes these hormones, so a healthy functioning liver is also crucial for proper insulin balance.

- Cut out all forms of refined sugar and carbohydrates, which include white bread, paste, white rice, rice cakes, most breakfast cereals or any starchy, low fibre food.
- Avoid sweeteners, soda, fruit juice and any drinks that rapidly raise the blood sugar level.
- Consume adequate amount of protein, such as lean meat, and soybean products.
- Plenty vegetables, but preferably slightly cooked vegetables.
- Eat only complex whole grains like oatmeal, brown rice and whole wheat.
- Avoid cold food, ice cold drinks, milk and dairy products.
- Eliminate alcohol and caffeine.
- Exercise regularly.

Case Studies

Case one: PCOS with Multiple Sclerosis (MS)

Medical history:

Kate, 34 years old, Company director.

She had always had irregular menstrual cycle, which was between 30 to 70 days, with scanty and mucus-like bleeding, spotting for 10-14 days after period, severe PMT, lower backache, numb and tingling sensation down to both legs and feet, very tired and sluggish. She had been trying to conceive for seven years, had gone through two cycles of IUI and one IVF attempt. She had achieved three pregnancies, including two of which miscarried at early stage, and one resulting in a child birth in 2004. She had wished to have a sibling for her daughter, but refused

to go through IVF again. She was stressed and anxious, pale tongue with white-greasy coating, fine-slippery pulses.

Differentiation:

Deficiency of spleen qi and kidney yang, together with accumulation of phlegm and damp, and stagnation of liver qi.

Treatment Plan:

Acupuncture weekly or every fortnight, together with patent herbs daily, modification applied accordingly.

Treatment Progress:

1st cycle: After two sessions of acupuncture and herbal medicine, had a 37 days cycle, but still experienced PMT, bleeding was light and watery.

2nd & 3rd cycles: ovulated on day 14 with increased vaginal fertile mucus. Had a 28 days cycle with normal blood flow, spotted for 3 days instead of 10-12 days after proper bleeding, no PMT, feeling good.

4th cycle: really stressed with moving house, very tired and emotional. Had a 34 days cycle, although ovulated on day 14, proper bleeding for 3 days, and spotted for 5 days afterwards.

5th cycle: ovulated on day 14 again, pregnancy test on day 35 was positive.

She had continued treatment until 16 weeks pregnant, had experienced a smooth and healthy pregnancy, and delivered a baby boy naturally in November 2007.

Case two: PCOS & Recurrent Miscarriages

Medical history:

Helen, aged 33, HR advisor.

She had had two miscarriages at age of 25, then conceived and delivered her daughter at age of 26. Her period was 28 days cycle until December 1997 when she started taking oral contraceptive pills. She had been trying for second child since January 2002 when she came off the pills, but had no menstruation for 6 months, and then suffered from very irregular periods ever since. She had only two menstrual periods between March 2005 and December 2005, and was then diagnosed with PCOS. She had been taking Clomid since April 2006 for 9 months, had achieved a pregnancy in November 2006, but miscarried again at 6 weeks. She had visited me after miscarriage, the main symptoms were: stress, depression, anxiety, fatigue, prolonged period with scanty bleeding. Her tongue was pale with thin coating and black spots on the edge, deep and fine pulses.

Differentiation: Spleen qi deficiency with blood stasis.

Treatment plan and progress:

Chinese herbal powders were given every day combined with acupuncture weekly.

1st visit (Day 7 of cycle): modified Bazhen yimu tang and Nuangong yunzi tang.

2nd visit (Day 14 of cycle): modified Zhuyun tang plus Taohong siwu tang.

3rd visit (Day 21 of cycle): had ovulation pain and

vaginal fertile mucus, test confirmed ovulation was on day 19 of cycle. Modified Tiaojing cuyun tang plus Congrun bushen tang.

4th visit (Day 28 of cycle): Modified Tiaojing buxue tang.

5th visit (Day 35 of cycle): feeling tired and sick, pregnancy test was positive.

She had continued treatment weekly until 12 weeks of pregnant, had delivered a baby boy in October 2007.

Case three: PCOS

Medical history:

Fiona, 37 years old, Singer and Musician.

She had been trying to conceive for 3 years, and was diagnosed with PCOS in 2006. Her menstrual cycle was between 35 to 55 days with scanty bleeding. She had never produced vaginal fertile mucus around mid-cycle, and blood tests and scan had shown anovulation. She had always been a vegetarian, exercise excessively which lead to under-weight. Her tongue was red with thin coating, wiry and rapid pulse. Her husband was 39 years old, an alcoholic. He had worked hard and was stressed, and his sperm motility was 8% only. They were referred to me when undergoing IVF/ICSI. I had suggested delaying IVF/ ICSI treatment while preparing her body with TCM, but they decided to go ahead with ICSI. She had experienced ovarian hyper-stimulation syndrome (OHSS), felt sick, very bloated and sore stomach. She had nine eggs retrieved, although had produced 25 follicles, then six of which were fertilized, two embryos of grade 2 and grade 3 were transferred. She had achieved a biochemical pregnancy, but started bleeding few days later.

She visited me again 2 weeks later, had decided following my advice, trying to conceive naturally with TCM treatment.

Differentiation: Kidney yin and blood deficiency with liver qi stagnation

Treatment plan: Chinese herbal tablets were given to both partners, and combined with acupuncture for Fiona.

Treatment progress:

1st cycle: ovulated on day 35, and a bit fertile mucus was seen around the same time, had a 51 days menstrual cycle.

2nd cycle: ovulation on day 25 with clear stretchy vaginal discharge, basal body temperature (BBT) chart showing a good pattern, had a 39 days cycle.

3rd cycle: ovulated on day 22. Slippery and rapid pulses were detected by day 34; by day 40, started feeling tired, tender breasts and dull stomach ache, pregnancy test was positive.

She had a healthy pregnancy all way through, delivered a baby boy in November 2009. She had then conceived naturally again without further afford, and she is now a proud mum of two children.

Conclusion

PCOS is a rather common and complicated gynaecological condition. It is considered a syndrome

because it has a number of unrelated symptoms, and usually occurs with one or more of the symptoms, therefore it is often misdiagnosed at early stage, or may take a long process before making a diagnosis and left it untreated until start trying to conceive. In my clinical practice, many women turned up with infertility issues, they may have already gone through several failed IVF attempts, but the actual underline cause was PCOS. TCM combine with dietary therapy is the most optimum and effective treatment for PCOS and its related infertility. Here I summarise some key factors as below:

- 1) TCM believes PCOS is a combination of both excess and deficient condition, which usually the involved organs are kidney, spleen, liver and chong and ren vessels. The most commonly seen patterns are: deficiency of spleen Qi and kidney yang, accumulation of phlegm and damp; deficiency of kidney yin and blood, together with liver qi stagnation; blood stasis with phlegm and heat, blockage of chong and ren vessels.
- 2) TCM treatment should focus on strengthening spleen Qi and kidney yang to remove damp and phlegm, soothing liver qi to motivate blood and resolve blood stasis, unblock the chong and ren channels.
- 3) Maintaining a healthy weight by healthy diet and exercise is also crucial to manage PCOS. It helps regulating menstruation, hence improving fertility.
- 4) Laparoscopic surgery may be considered for severe cases of PCOS. However TCM should be applied after the procedure to prevent scar tissue forming on the ovaries.
- 5) IVF treatment may be necessary if other fertility issues involved, for example male factor infertility. However, women with PCOS often don't respond well to hormonal stimulation drugs used in the IVF treatment, either produce very few eggs with poor quality, and consequently poor fertilization; or suffer from OHSS, which can be life threatening. Therefore, TCM treatment is demanding before the procedure to prepare their body be the best possible condition, hence to produce best response to IVF, increase their chances of conceiving.
- 6) If pregnancy occurred, TCM treatment should be continued during early pregnancy to protect the fetus and prevent miscarriage.

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