

Research Progress in Clinical Studies of Polycystic Ovary Syndrome: A Narrative Review

Yuhuan Zou, Jingfeng Yang*

Shaanxi University of Chinese Medicine, Xianyang 712046, Shaanxi, China

*Correspondence Author

Abstract: *Polycystic ovary syndrome (PCOS) is a highly prevalent reproductive endocrine and metabolic disorder among women of reproductive age. Its pathophysiological mechanisms encompass genetic susceptibility, insulin resistance, low-grade chronic inflammation, and dysfunction of the hypothalamic-pituitary-ovarian (HPO) axis, exhibiting significant clinical heterogeneity. PCOS can lead to reproductive dysfunction, metabolic syndrome, and psychological disorders, severely compromising patients' quality of life. Given the complex pathogenesis and variable clinical manifestations of this disease, single-modality interventions often prove inadequate. Traditional Chinese Medicine (TCM), guided by the holistic concept and centered on syndrome differentiation and treatment, has accumulated substantial evidence-based medical data in regulating HPO axis homeostasis and optimizing the local microenvironment of the ovary. TCM theory generally attributes the pathological essence of PCOS to "deficiency in root and excess in branch, "with kidney deficiency as the root cause, and liver qi stagnation, blood stasis, and phlegm-dampness as the branch manifestations. The therapeutic principles involve tonifying the kidney and replenishing essence, soothing the liver and regulating qi, activating blood circulation and eliminating stasis, drying dampness and resolving phlegm, supplemented by acupuncture and meridian regulation. This article systematically reviews the current research status of TCM(including acupuncture), modern pharmacological, and surgical interventions for PCOS through a comprehensive literature search of recent domestic and international publications, analyzing the therapeutic characteristics, mechanisms of action, and safety profiles of various treatment modalities, with the aim of providing theoretical basis and clinical reference for multidisciplinary collaborative diagnosis and treatment and individualized therapeutic regimen formulation.*

Keywords: Polycystic ovary syndrome, Traditional Chinese medicine therapy, Acupuncture, Western medicine intervention, Treatment strategy, Evidence-based medicine.

1. Introduction

Polycystic ovary syndrome represents the most common endocrine and metabolic disorder syndrome in women of reproductive age, characterized clinically by chronic anovulation, clinical or biochemical hyperandrogenism, and polycystic ovarian morphology (PCOM). It may be accompanied by skin acne, hirsutism, oligomenorrhea or even amenorrhea, decreased fertility, and glucolipid metabolic disturbances associated with insulin resistance. According to domestic epidemiological surveys, the prevalence of PCOS among Chinese women of reproductive age is approximately 6.05%, accounting for 13.69% of female infertility etiologies [1]; moreover, the incidence of this disease has shown an increasing trend over the past three decades, with a tendency toward younger age groups [2]. The pathogenesis of PCOS has not yet been fully elucidated; existing research suggests that its onset is closely associated with genetic susceptibility, insulin resistance, low-grade chronic inflammation, and neuroendocrine regulatory imbalance of the hypothalamic - pituitary - ovarian (HPO) axis, involving multi-level pathological alterations including abnormal insulin signaling pathways, dysregulated inflammatory cytokine networks, and changes in the local ovarian microenvironment.

Modern medical interventions primarily comprise pharmacological regulation and laparoscopic surgical treatment; however, long-term hormone replacement therapy may increase the risks of metabolic syndrome and thrombotic events, while ovarian drilling may potentially compromise ovarian reserve function. TCM intervention for PCOS boasts a long history. Through multi-modal therapeutic pathways including herbal compound prescriptions and acupuncture, TCM has demonstrated multi-target, holistic regulatory advantages in inducing spontaneous ovulation, improving

endometrial receptivity, and correcting metabolic disorders, with mild adverse reactions and favorable tolerability. Therefore, constructing a low-toxicity, high-efficiency comprehensive intervention strategy that balances short-term efficacy with long-term prognosis holds significant clinical importance for optimizing reproductive outcomes and long-term quality of life in PCOS patients. This article aims to systematically review the progress of Chinese and Western medical interventions for PCOS, providing evidence-based reference for clinical decision-making.

2. Current Research Status of TCM Intervention in Polycystic Ovary Syndrome

2.1 Clinical Intervention Studies Based on Kidney-Tonifying Therapy

The kidney stores essence, governs reproduction, and serves as the foundation of congenital constitution; the root of PCOS pathogenesis is largely attributed to kidney deficiency. Physicians throughout successive generations have predominantly approached treatment from the perspective of kidney tonification, either by warming and reinforcing kidney yang or by nourishing and replenishing kidney essence, yielding definite clinical efficacy. Li Meiling et al. [3] applied Fufang Xuanju Capsules in patients with kidney-yang deficiency-type PCOS complicated by infertility undergoing artificial insemination by husband (AIH) cycles. This study enrolled 60 patients, randomly divided into treatment and control groups of 30 cases each. The medication was administered orally from day 3 of the AIH cycle, three capsules per dose, three times daily, continuously until day 7 post-ovulation, for a total of three cycles. The results demonstrated that this preparation could increase endometrial

thickness and optimize endometrial receptivity through the methods of warming and reinforcing kidney yang, and supplementing qi and generating blood. The embryo implantation rate in the treatment group was significantly higher than that in the control group ($P < 0.05$), and the clinical pregnancy rate also showed an increasing trend, confirming that kidney-tonifying and yang-warming methods can improve reproductive outcomes.

Liu Xinmin et al. [4] treated PCOS patients with kidney-yin deficiency and exuberant fire pattern complicated by hyperandrogenemia using modified Zhibai Dihuang Decoction (containing “Anemarrhena asphodeloides” 15g, “Rehmannia glutinosa” 15g, “Phellodendron chinense” 10g, “Epimedium” 10g, etc.). This randomized controlled study enrolled 80 patients; the treatment group received modified Zhibai Dihuang Decoction, while the control group received Diane-35 orally, continuously for three menstrual cycles. The results confirmed that this formula possesses the effects of nourishing yin, reducing fire, tonifying the kidney, and regulating menstruation, and could induce the restoration of spontaneous ovulation in patients. The ovulation rate in the treatment group was significantly superior to that of the control group, and the decrease in serum testosterone (T) levels was more pronounced, suggesting that yin-nourishing and kidney-tonifying methods possess targeted intervention value for kidney-yin deficiency-type PCOS. Hou Jingyan et al. [5] intervened in a kidney-yin deficiency-type PCOS animal model using modified Loushi Decoction (“Rehmannia glutinosa” 15g, “Angelica sinensis” 10g, “Asparagus cochinchinensis” 10g, “Ophiopogon japonicus” 10g, “Dendrobium nobile” 10g, “Trichosanthes” seed 15g, etc.). A PCOS rat model was established through letrozole gavage combined with high-fat diet feeding. After successful modeling, the animals were randomly divided into model, herbal (modified Loushi Decoction), and western medicine (metformin) groups, with intragastric administration for four weeks. The results showed that this formula could regulate Follistatin and Activin expression, correct sex hormone secretion disorders, and its mechanism of action may be related to regulating the transforming growth factor- β (TGF- β) superfamily signaling pathway.

Jiang Jun et al. [6] treated kidney-yang deficiency-type PCOS using modified Baxian Decoction (composed of *Morinda officinalis* 15g, *Curculigo orchioides* 10g, *Epimedium* 15g, Deer antler frost 10g, *Cuscuta chinensis* 15g, *Polygonatum sibiricum* 15g, *Pinellia ternata* 10g, etc.), enrolling 120 patients randomly divided into treatment and control groups. The treatment group received modified Baxian Decoction, while the control group received clomiphene citrate, continuously for three menstrual cycles. In addition to regulating estrogen and progesterone levels, the results demonstrated inhibition of excessive activation of the renin-angiotensin-aldosterone system (RAAS), improvement of peripheral insulin resistance, and reduction of water-sodium retention, contributing to body weight management and thereby enhancing the natural pregnancy rate. The aforementioned evidence-based data indicate that kidney-tonifying herbal formulas can exert multi-target effects through regulating the neuroendocrine-metabolic network, occupying a central position in the syndrome differentiation and treatment system of PCOS.

2.2 Clinical Intervention Studies Based on Liver-Soothing Therapy

The liver governs free coursing and regulates the flow of qi; emotional frustration leads to liver qi stagnation, abnormal free coursing, disharmony of the Conception and Governor vessels, and consequent exacerbation of menstrual disorders. Lin Jing et al. [7] treated kidney deficiency with liver depression pattern PCOS using self-formulated Bushen Shugan Decoction (*Paeonia lactiflora* 15g, *Atractylodes macrocephala* 15g, *Polygonum orientale* 10g, *Dioscorea opposita* 15g, *Ligustrum lucidum* 15g, *Cyperus rotundus* 10g, *Rubus chingii* 10g, *Trachelospermum jasminoides* 10g, Moutan cortex 10g, *Bupleurum chinense* 10g, *Citrus reticulata* 10g, etc.). This study enrolled 86 patients randomly divided into treatment (Bushen Shugan Decoction) and control (Diane-35) groups, continuously treated for three menstrual cycles. The results indicated that this formula could reduce serum testosterone (T) concentrations, improve the pulsatile secretion rhythm of follicle-stimulating hormone (FSH), and exert regulatory effects on hormone metabolism. The total effective rate in the treatment group was significantly superior to that of the control group ($P < 0.05$).

Xiong Fan et al. [8] intervened in PCOS patients complicated by insulin resistance using the kidney-tonifying, liver-soothing, and blood-activating method. This randomized controlled study enrolled 120 patients; the treatment group received the kidney-tonifying, liver-soothing, and blood-activating formula (*Cuscuta chinensis* 15g, *Bupleurum chinense* 10g, *Salvia miltiorrhiza* 15g, *Paeonia lactiflora rubra* 10g, etc.), while the control group received metformin, continuously treated for 12 weeks. This therapeutic approach was found to correct sex hormone disorders while alleviating anxiety and depression, with Hamilton Anxiety Scale (HAMA) and Hamilton Depression Scale (HAMD) scores in the treatment group significantly lower than those in the control group, reflecting the holistic regulatory advantage of TCM’s “unity of form and spirit.”

Li Qingli [9] treated infertility caused by liver qi stagnation-type PCOS using modified Bailing Tiaogan Decoction (*Bupleurum chinense* 10g, *Cyperus rotundus* 10g, *Curcuma aromatica* 10g, *Citrus reticulata* 10g, *Paeonia lactiflora* 15g, *Angelica sinensis* 10g, etc.), enrolling 60 patients. The treatment group received modified Bailing Tiaogan Decoction combined with clomiphene citrate, while the control group received clomiphene citrate alone, continuously treated for three menstrual cycles. The liver-soothing and qi-regulating method was noted to significantly reduce ovarian volume and improve local ovarian microcirculation and blood perfusion, with the ovarian volume reduction rate and ovulation rate in the treatment group significantly superior to those of the control group. The above studies corroborate that liver-soothing therapies not only regulate the neuroendocrine function of the hypothalamic-pituitary-ovarian axis but also address emotional factors, aligning with the modern bio-psycho-social medical model.

2.3 Clinical Intervention Studies Based on Phlegm-Resolving Therapy

Patients with phlegm-dampness exuberance-type PCOS commonly present with obesity, delayed menstruation or even amenorrhea, and profuse leukorrhea; treatment should focus on resolving phlegm, eliminating dampness, regulating qi, and harmonizing menstruation. Li Xiangyun [10] treated phlegm-dampness-type PCOS using modified Cangfu Daotan Decoction (Pinellia ternata 10g, Bamboo shavings 10g, Acorus tatarinowii 10g, Citrus reticulata 10g, Pogostemon cablin 10g, Alisma orientale 15g, Atractylodes macrocephala 15g, Atractylodes lancea 10g, Agastache rugosa 10g, Aconitum carmichaelii 6g, etc.), proposing that phlegm-dampness obstructing the middle burner and derangement of qi ascending and descending constitute the key pathological links leading to menstrual disorders. This therapeutic method regulates the Conception and Governor vessels' qi and blood by drying dampness, resolving phlegm, strengthening the spleen, and regulating qi, thereby restoring the transformative and transportive functions of the middle burner.

Fu Ping [11] intervened in this pattern using Huashi Tiaochong Formula (Arisaema cum bile 10 g, Pinellia ternata 10g, Acorus tatarinowii 10g, Cuscuta chinensis 15g, Fluorite 15g, Angelica sinensis 10g, Placenta hominis 10g, Epimedium 10g, etc.), enrolling 90 patients randomly divided into treatment and control groups. The treatment group received Huashi Tiaochong Formula, while the control group received Diane-35, continuously treated for six menstrual cycles. The results demonstrated effects in drying dampness, resolving phlegm, warming the kidney and reinforcing yang, and regulating Conception and Governor vessels' qi and blood. The menstrual cycle restoration rate and ovulation rate in the treatment group were significantly superior to those of the control group, and the body mass index (BMI) decrease was more pronounced.

Zha Qingshan et al. [12] treated phlegm-dampness obstruction pattern PCOS using Huatan Tiaojing Formula (Atractylodes lancea 10g, Cyperus rotundus 10g, Citrus reticulata 10g, Pinellia ternata 10g, Poria cocos 15g, Arisaema cum bile 10g, Angelica sinensis 10g, Ligusticum chuanxiong 10g, etc.) combined with western medicine. This randomized controlled study enrolled 100 patients; the treatment group received Huatan Tiaojing Formula combined with Diane-35, while the control group received Diane-35 alone, continuously treated for three menstrual cycles. The integrated Chinese and Western medicine protocol was confirmed to be superior to western medicine monotherapy in regulating sex hormone levels and reducing polycystic ovarian volume, with the total effective rate in the treatment group reaching 88.0%, significantly higher than 72.0% in the control group ($P < 0.05$). Thus, the phlegm-eliminating and dampness-resolving method can effectively improve patients' reproductive endocrine function by removing phlegm-turbidity pathological products and restoring the ascending, descending, entering, and exiting of qi, being particularly suitable for obese-type PCOS.

2.4 Clinical Intervention Studies Based on Blood-Stasis-Eliminating Therapy

Blood stasis obstructing the uterus and blocked channels and collaterals prevent the generation of new blood when old

blood fails to be removed, manifesting as oligomenorrhea and even infertility. Niu Jingyun et al. [13] treated kidney deficiency with blood stasis-type PCOS amenorrhea using Bushen Huoxue Formula (Astragalus membranaceus 20g, Cyperus rotundus 10g, Epimedium 15g, Salvia miltiorrhiza 15g, Crataegus pinnatifida 10g, Poria cocos 15g, etc.), enrolling 80 patients randomly divided into treatment and control groups of 40 cases each. The treatment group received Bushen Huoxue Formula, while the control group received Diane-35, continuously treated for six menstrual cycles. The total effective rate reached 80%; this formula could reduce the serum luteinizing hormone/follicle-stimulating hormone (LH/FSH) ratio, promote follicle recruitment, development, and dominant follicle discharge, and its mechanism of action may be related to improving local ovarian hemodynamics.

Zhang Xiaowen [14] treated kidney deficiency with blood stasis-type PCOS infertility using modified Bushen Huoxue Decoction (Rehmannia glutinosa 15g, Fluorite 15g, Cuscuta chinensis 15g, Achyranthes bidentata 10g, Persica semen 10g, Salvia miltiorrhiza 15g, Taxillus chinensis 15g, Deer antler glue 10g, Alisma orientale 10g, etc.) combined with clomiphene citrate, enrolling 120 patients randomly divided into treatment (modified Bushen Huoxue Decoction combined with clomiphene citrate) and control (clomiphene citrate alone) groups, continuously treated for three menstrual cycles. The total clinical effective rate reached 90%; the mechanism of action involves improving local ovarian microcirculation, regulating sex hormone secretion, and accelerating follicle maturation and discharge, with ovulation and clinical pregnancy rates in the treatment group significantly superior to those of the control group ($P < 0.01$). The blood-activating and stasis-eliminating method provides a favorable endometrial environment for embryo implantation by improving endometrial blood perfusion and dissipating blood stasis in uterine collaterals, possessing positive significance for improving endometrial receptivity.

3. Research Progress in Western Medicine Treatment of Polycystic Ovary Syndrome

3.1 Pharmacological Treatment for Menstrual Cycle Regulation and Hyperandrogenemia

For PCOS patients without immediate fertility plans, the primary therapeutic goals are to reestablish regular menstrual cycles, suppress excessive androgen secretion, and protect the endometrium from long-term unopposed estrogen stimulation due to anovulation. Combined oral contraceptives (COC) represent the first-line drug recommended by current guidelines; their pharmacological mechanism involves suppressing the hypothalamic-pituitary axis through exogenous estrogen-progesterone negative feedback, reducing LH pulsatile secretion, thereby decreasing androgen biosynthesis in ovarian theca cells, while simultaneously inducing regular withdrawal bleeding and reducing the risk of endometrial hyperplasia and endometrioid adenocarcinoma. Commonly used clinical preparations include Marvelon containing desogestrel and ethinylestradiol, Diane-35 containing cyproterone acetate, and Yasmin/Yaz containing drospirenone. Among these, cyproterone acetate possesses potent anti-androgenic activity, effectively improving clinical manifestations of hyperandrogenism such as acne and

hirsutism.

Furthermore, anti-androgen agents including spironolactone, flutamide, and finasteride competitively antagonize androgen receptors or inhibit 5 α -reductase activity to block testosterone conversion to dihydrotestosterone (DHT); however, these drugs carry potential teratogenic risks and are absolutely contraindicated in women planning pregnancy or during pregnancy. Li Yu'e et al. [15] reported a total effective rate of 93.33% for Diane-35 in treating PCOS; this study enrolled 90 patients randomly divided into treatment (Diane-35 combined with Zishen Yutai Pills) and control (Diane-35 alone) groups, continuously treated for three menstrual cycles, with results showing that the combination group demonstrated greater advantages in improving menstrual cycles and reducing androgen levels.

Dai Yingying et al. [16] observed the application of Marvelon in patients with ovulatory dysfunctional abnormal uterine bleeding, enrolling 120 patients randomly divided into Marvelon and Diane-35 groups, continuously treated for three menstrual cycles. Marvelon was found to effectively establish regular menstrual cycles and reduce serum androgen levels, with lower incidence rates of androgen-related adverse reactions such as weight gain and acne compared to the Diane-35 group, and milder impact on liver function, suggesting that Marvelon possesses certain advantages in metabolic safety.

3.2 Ovulation-Inducing Drug Therapy

For PCOS patients with fertility requirements, ovulation induction constitutes the critical therapeutic link. Commonly used ovulation-inducing drugs mainly include the selective estrogen receptor modulator (SERM) clomiphene citrate (CC) and the third-generation aromatase inhibitor (AI) letrozole (LE). The former competitively binds to hypothalamic estrogen receptors, blocking estrogen negative feedback and promoting gonadotropin-releasing hormone (GnRH) pulsatile secretion; the latter inhibits aromatase activity to block androstenedione conversion to estrone, reducing estrogen levels and relieving central negative feedback inhibition of the hypothalamic-pituitary axis by estrogen, thereby promoting endogenous FSH secretion to induce dominant follicle recruitment, development, and eventual ovulation.

Jing Xiuju et al. [17] compared the ovulation-inducing efficacy of CC and LE, enrolling 120 patients randomly divided into CC (60 cases) and LE (60 cases) groups, orally administered CC 50 mg/d or LE 2.5 mg/d respectively on days 3–7 of the menstrual cycle for five consecutive days. Results showed that the ovulation rate in the LE group (66.67%) was superior to that in the CC group (47.92%), with lower multiple pregnancy risk in the LE group, suggesting that LE may possess advantages in PCOS ovulation induction therapy. However, Zhou Ping [18] reached contradictory conclusions; this study enrolled 100 patients randomly divided into CC and LE groups, with results indicating that the ovulation and clinical pregnancy rates in the CC group were superior to those in the LE group, suggesting that CC ovulation induction efficacy is superior to LE. This indicates that the efficacy of different ovulation-inducing drugs is influenced by individual patient characteristics, exhibiting significant heterogeneity,

and clinical selection requires individualization.

Jiao Shoufeng et al. [19] found that the CC combined with LE regimen could shorten the ovulation induction cycle and improve ovulation and clinical pregnancy rates. This study enrolled 150 patients randomly divided into CC, LE, and combination groups, with the combination group orally administered CC 50 mg/d combined with LE 2.5 mg/d on days 3–7 of the menstrual cycle. Results showed that the ovulation rate in the combination group reached 78.0%, significantly higher than the monotherapy groups, without significantly increasing multiple pregnancy risk. Clinical formulation of ovulation induction regimens should comprehensively consider patient age, body mass index (BMI), ovarian reserve (OR), and previous ovulation induction responses, implementing individualized medication.

3.3 Pharmacological Treatment for Insulin Resistance

The incidence of insulin resistance (IR) in PCOS patients is approximately 60%–80%; compensatory hyperinsulinemia can stimulate androgen synthesis in ovarian theca cells, exacerbating glucolipid metabolic disturbances. Metformin, as a biguanide insulin sensitizer, enhances peripheral tissue insulin sensitivity by activating the AMP-activated protein kinase (AMPK) signaling pathway, promotes glucose uptake and utilization, inhibits excessive proliferation and androgen secretion in ovarian theca cells, and indirectly restores normal feedback regulation of the hypothalamic-pituitary-ovarian axis and ovulatory function.

Dang Cuiling et al. [20] adopted a metformin combined with clomiphene citrate regimen in obese PCOS patients, enrolling 200 patients randomly divided into combination (metformin+CC) and monotherapy (CC) groups. The combination group received metformin 500 mg three times daily combined with CC 50 mg/d, continuously treated for three menstrual cycles. The ovulation rate reached 89.96%, and the clinical pregnancy rate 42.50%, significantly superior to the CC monotherapy group (ovulation rate 65.33%, pregnancy rate 28.33%), confirming that metformin can enhance CC sensitivity and improve ovulation induction efficacy. Thiazolidinedione (TZD) insulin sensitizers (such as pioglitazone) can also improve peripheral insulin sensitivity by activating peroxisome proliferator-activated receptor- γ (PPAR- γ) to regulate glucolipid metabolism; however, due to water-sodium retention, weight gain, and potential cardiovascular adverse event risks, their clinical application is strictly limited. Li Xueli et al. [21] noted that compared with thiazolidinediones, metformin exhibits milder gastrointestinal adverse reactions, superior overall tolerability, a more favorable safety profile, and better cost-effectiveness, and should serve as first-line medication for insulin resistance-type PCOS.

3.4 Surgical Treatment

Laparoscopic ovarian drilling (LOD) is primarily indicated for CC-resistant PCOS patients with fertility requirements. Its mechanism of action involves destroying ovarian medullary stromal tissue through monopolar electrocoagulation or laser drilling, reducing ovarian-derived androgens and inhibin B

secretion, lowering serum LH concentrations, relieving the dual central-ovarian inhibition of high-level androgens and inhibin on follicle development, thereby inducing spontaneous ovulation. This surgical approach restores normal follicle development and ovulatory function by reducing local ovarian androgen levels and improving the follicular microenvironment. Gao Tanbing et al. [22] reported a cumulative clinical effective rate of 81.15% and cumulative pregnancy rate of approximately 65.86% six months post-LOD; this study retrospectively analyzed 389 PCOS infertility patients undergoing LOD, with postoperative follow-up of 6–24 months, showing a postoperative ovulation restoration rate of 85.6%, with the natural pregnancy rate demonstrating a declining trend over time, suggesting that active conception guidance should be provided postoperatively. Ma Jijia [23] reported postoperative ovulation and clinical pregnancy rates of 82% and 78% respectively; this study enrolled 50 CC-resistant PCOS patients, with follow-up for one year post-LOD, showing the highest pregnancy rate within six months postoperatively, gradually declining thereafter. Although laparoscopic surgery possesses minimally invasive advantages and rapid postoperative recovery, intraoperative thermal injury may damage preantral follicles and ovarian reserve, leading to diminished ovarian reserve (DOR) or even iatrogenic premature ovarian insufficiency (POI); therefore, it is currently mostly considered as a second-line alternative option in clinical practice, with its long-term reproductive safety requiring further evidence-based medical support. Additionally, postoperative pelvic adhesion formation may affect tubal function, necessitating meticulous intraoperative manipulation and active postoperative anti-adhesion management.

4. Acupuncture and Moxibustion Treatment of Polycystic Ovary Syndrome: Point Selection Rules and Clinical Efficacy

Acupuncture intervention for PCOS generally follows the principles of “point selection based on disease differentiation” and “adjacent point selection,” commonly selecting points from the Conception Vessel, Foot-Taiyin Spleen Meridian, and Foot-Yangming Stomach Meridian, with Guanyuan (CV4), Zigong (EX-CA1), and Sanyinjiao (SP6) as the core acupoint combinations, emphasizing the synergistic enhancement of “upper-lower point pairing” and “anterior-posterior point pairing” [24]. Among these, Guanyuan belongs to the Conception Vessel, serving as the Front-Mu point of the small intestine, capable of cultivating primordial qi and warming the lower jiao; Sanyinjiao is the intersection point of the Foot-Taiyin, Jueyin, and Shaoyin meridians, capable of strengthening the spleen, soothing the liver, benefiting the kidney, and regulating the Conception and Governor vessels; Zigong is an extra point capable of directly reaching the disease site and regulating uterine qi and blood.

He Xueping et al. [25] randomly divided 106 PCOS patients into an acupuncture group (points: bilateral Ganshu (BL18), Shenshu (BL23), Zhongwan (CV12), Guanyuan (CV4), Shuifen (CV9), Zhongji (CV3), etc., retaining needles for 30 minutes per session, every other day, continuously treated for three months) and a western medicine group (oral clomiphene citrate). After three months of intervention, the total effective

rate in the acupuncture group was 96.23%, significantly superior to 83.02% in the western medicine group ($P < 0.05$); moreover, the acupuncture group showed more significant decreases in serum LH and T levels, with greater increases in estradiol (E2) and progesterone (P) compared to the control group, suggesting that acupuncture can regulate neuroendocrine function through multi-target pathways. Chen Dan [26] compared medicinal moxibustion (points: Guanyuan (CV4), Shenque (CV8), Zigong (EX-CA1), bilateral Sanyinjiao (SP6), using self-prepared herbal cakes with ginger moxibustion, three cones per point, three times weekly) with conventional filiform needle acupuncture, enrolling 60 patients randomly divided into medicinal moxibustion and acupuncture groups, continuously treated for three menstrual cycles. Medicinal moxibustion was found to act more rapidly in reestablishing regular menstrual cycles, reducing the LH/FSH ratio, and reducing polycystic ovarian volume, with better patient compliance, possibly related to the warming effect of moxibustion improving pelvic blood circulation. Cao Yu et al. [27] treated PCOS using Dong's extraordinary points (Fuque point, Huanchao point, Tianhuang point, Renhuang point) combined with bloodletting at stasis-collateral reaction points, enrolling 40 patients treated with Dong's extraordinary point acupuncture combined with bloodletting, twice weekly, continuously treated for 12 weeks. After 12 weeks of intervention, follicle development and menstrual cycles returned to normal, with no recurrence observed during six-month follow-up, and the total effective rate reached 92.5%. Acupuncture provides an effective supplementary means of non-pharmacological intervention for PCOS by regulating the neuro-endocrine-immunological (NEI) network, improving local ovarian blood perfusion, and regulating hypothalamic GnRH neuronal pulsatile secretion, featuring simple operation and mild adverse reactions.

5. Reflections and Prospects

PCOS represents a typical multi-system syndrome resulting from the interaction of polygenic inheritance and environmental factors, with complex and diverse clinical phenotypes involving multi-dimensional functional disturbances in reproduction, metabolism, and psychology. TCM theory attributes its core pathogenesis to “deficiency in root and excess in branch,” “with root deficiency mostly attributed to kidney yin and yang deficiency, and branch excess involving liver qi stagnation, blood stasis internal stagnation, and phlegm-dampness exuberance; pure deficiency or excess patterns are rarely seen clinically, mostly manifesting as intermixed deficiency and excess patterns that are mutually causal, forming a vicious cycle of “excess arising from deficiency and deficiency arising from excess.”

At the present stage, TCM clinical practice predominantly employs kidney-tonifying and liver-soothing, stasis-eliminating and dampness-resolving methods as the major therapeutic principles. Leveraging the multi-component, multi-target, multi-pathway integrated regulatory advantages of herbal compound prescriptions, these methods can regulate the pulsatile secretion rhythm of hypothalamic GnRH neurons, thereby improving feedback regulation of the pituitary-ovarian axis and promoting normal follicle recruitment, selection, and dominant development; blood-activating and stasis-eliminating drugs can also improve endometrial

microcirculatory disturbances, inhibit chronic inflammatory responses and oxidative stress damage, possessing positive significance for preventing long-term complications such as metabolic syndrome, type 2 diabetes mellitus, and cardiovascular disease in PCOS. Although modern pharmacological and surgical interventions provide definite short-term symptom control, the metabolic adverse reactions of long-term hormone replacement therapy and the potential damage of surgery to ovarian reserve cannot be ignored.

Future clinical practice should advocate an integrated Chinese and Western medicine, precise individualized diagnosis and treatment model unifying syndrome differentiation and disease identification, fully leveraging the holistic regulation and cyclic sequential treatment advantages of TCM, combined with modern pharmacological precision ovulation induction or metabolic regulation, with the aim of optimizing pregnancy outcomes while minimizing treatment-related toxic side effects and improving long-term reproductive and metabolic prognosis. Specifically, the following research directions warrant attention: first, conducting large-sample, multi-center, randomized double-blind controlled clinical trials to elevate the evidence-based medical grade of TCM intervention for PCOS; second, employing systems biology technologies such as metabolomics and proteomics to deeply elucidate the multi-target molecular mechanisms of herbal compound prescriptions in intervening PCOS; third, establishing individualized efficacy prediction models based on TCM syndrome differentiation patterns to achieve precise syndrome-based treatment; fourth, exploring the synergistic enhancement mechanisms of combined acupuncture and herbal medicine application to optimize non-pharmacological intervention protocols; fifth, focusing on the long-term metabolic outcomes and mental health of PCOS patients to construct full life-cycle management strategies.

References

- [1] Qiu JG, Ding GXB, et al. The prevalence of polycystic ovary syndrome in Chinese women: a meta-analysis[J]. *Annals of Palliative Medicine*, 2021, 10(1): 74-87.
- [2] Liu LJ, Shao T, Fang Y, et al. Analysis of PCOS incidence trend in China from 1990 to 2019[J]. *Chinese Preventive Medicine*, 2023, 24(3): 259-263.
- [3] Li ML, Shao Y, Fu HY, et al. Clinical observation of Fufang Xuanju Capsules in improving pregnancy outcomes of AIH in PCOS patients with kidney-yang deficiency[J]. *Maternal and Child Health Care of China*, 2019, 34(10): 2326-2328.
- [4] Liu XM, Xu X, Zheng DX, et al. Clinical observation of modified Zhibai Dihuang Decoction in treating PCOS with hyperandrogenemia of kidney-yin deficiency and exuberant fire pattern[J]. *Chinese Journal of Integrated Traditional and Western Medicine*, 2018, 38(1): 29-32.
- [5] Hou JY, Fu P. Effects of modified Loushi Decoction on Follistatin and Activin in kidney-yin deficiency PCOS model mice[J]. *Zhejiang Journal of Integrated Traditional Chinese and Western Medicine*, 2018, 28(1): 9-12.
- [6] Jiang J, Gao HQ, Zeng P, et al. Clinical study on the effect of modified Baxian Decoction on RAS and ovulation induction in kidney-yang deficiency PCOS patients[J].
- [7] Lin J, Liu MZ. Clinical efficacy evaluation of self-formulated Bushen Shugan Decoction in treating kidney deficiency with liver depression pattern PCOS[J]. *China Foreign Medical Treatment*, 2018, 37(32): 170-172.
- [8] Xiong F, Li SQ, Liu YJ, et al. Efficacy observation of kidney-tonifying, liver-soothing, and blood-activating method in treating PCOS with insulin resistance[J]. *Modern Journal of Integrated Traditional Chinese and Western Medicine*, 2021, 30(2): 133-137, 144.
- [9] Li QL. Clinical observation of modified Bailing Tiaogan Decoction in treating liver qi stagnation-type PCOS infertility[J]. *Chinese Folk Therapy*, 2018, 26(9): 20-21.
- [10] Li XL, Li XY. Analysis of Li Xiangyun's experience and commonly used herb pairs in treating phlegm-dampness-type PCOS[J]. *Shanghai Journal of Traditional Chinese Medicine*, 2017, 51(11): 16-19.
- [11] Wang YY, Fu P. Exploration of Fu Ping's experience in treating PCOS[J]. *Zhejiang Journal of Traditional Chinese Medicine*, 2018, 53(4): 246-247.
- [12] Zha QS, Xing YF, Lyu YQ. Clinical effect of Huatan Tiaojing Formula combined with Diane-35 in treating phlegm-dampness obstruction pattern PCOS[J]. *China Practical Medicine*, 2020, 15(9): 159-160.
- [13] Niu JY, Hou LH, Li Y, et al. Effect of Bushen Huoxue Formula in treating kidney deficiency with blood stasis-type PCOS amenorrhea patients[J]. *China Medical Herald*, 2017, 14(23): 175-178.
- [14] Zhang XW. Clinical study of modified Bushen Huoxue Decoction combined with clomiphene citrate in treating kidney deficiency with blood stasis-type PCOS infertility[J]. *New Chinese Medicine*, 2020, 52(13): 46-48.
- [15] Li YE, Zeng L, Li YH, et al. Efficacy observation of Zishen Yutai Pills combined with Diane-35 in treating PCOS[J]. *Practical Clinical Medicine*, 2019, 20(8): 44-46, 49.
- [16] Dai YY, Yang Y. Efficacy of Marvelon in treating ovulatory dysfunctional abnormal uterine bleeding and its effect on sex hormone levels[J]. *Maternal and Child Health Care of China*, 2021, 36(4): 860-863.
- [17] Jing XJ, Wang XQ, Liu LX. Comparison of clinical effects of clomiphene and letrozole in treating PCOS[J]. *Henan Medical Research*, 2019, 28(11): 2000-2002.
- [18] Zhou P. Analysis of ovulation induction effects of clomiphene citrate and letrozole in PCOS infertility patients[J]. *Systematic Medicine*, 2020, 5(23): 129-131.
- [19] Jiao SF, Liu GJ, Li N. Effects of letrozole and clomiphene alone or in combination on menotropin dosage and ovulation outcomes in PCOS infertility patients[J]. *Chinese Journal of Family Planning & Gynecotology*, 2018, 10(8): 75-78.
- [20] Dang CL, Fang LN, Mei YF, et al. Efficacy of metformin combined with clomiphene in obese PCOS patients and its effects on serum Hp and FABP[J]. *Chinese Journal of Clinical Obstetrics and Gynecology*, 2021, 22(1): 92-93.
- [21] Li XL, Wang XD, Gan G, et al. Value analysis of metformin combined with cyproterone acetate in treating PCOS[J]. *China Pharmaceuticals*, 2020, 29(24): 63-67.
- [22] Gao TB, Zhang YD, Ding XL, et al. Surgical treatment of PCOS infertility: clinical analysis of 389 cases[J].

- Chinese and Foreign Women's Health Research, 2017(2): 140, 145.
- [23] Ma JJ. Efficacy and safety of laparoscopic ovarian drilling in treating PCOS complicated by infertility[J]. Journal of Dajia Health (Academic Edition), 2015, 9(15): 86.
- [24] Jia WH, Zhou HF. Exploration of point selection and prescription rules for acupuncture treatment of PCOS based on TCM inheritance computing platform[J]. Journal of Liaoning University of Traditional Chinese Medicine, 2023, 25(4): 119-125.
- [25] He XP, Pan ZX, Huang J. Clinical study of acupuncture therapy guided by TCM syndrome differentiation in treating PCOS[J]. Medical Innovation of China, 2017, 14(22): 66-68.
- [26] Chen D. Clinical efficacy observation of medicinal moxibustion in treating menstrual disorders in PCOS patients[D]. Fuzhou: Fujian University of Traditional Chinese Medicine, 2015.
- [27] Cao Y, Zhang L, Gao TY. Clinical experience of Dong's extraordinary point acupuncture in treating PCOS[J]. Beijing Journal of Traditional Chinese Medicine, 2017, 36(7): 629-630.