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The impact of comprehensive treatment on pregnancy outcomes in patients with polycystic ovary syndrome

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Abstract. This study focuses on the impact of comprehensive treatment on pregnancy outcomes in patients with polycystic ovary syndrome (PCOS). In this research, 60 PCOS patients admitted to our hospital between January 2022 and April 2023 were selected and randomly divided into two groups. The control group (n=30) received conventional Western medical treatment, while the observation group (n=30) received integrated traditional Chinese and Western medicine treatment. The two groups were compared in terms of sex hormone levels, endometrial receptivity indices, pregnancy outcomes, incidence of adverse reactions, overall treatment efficacy, and Traditional Chinese Medicine (TCM) syndrome scores. The study found that before treatment, there were no significant differences between the two groups in terms of sex hormone levels, endometrial receptivity indices, and TCM syndrome scores ($P>0.05$). After treatment, the observation group showed significantly better results than the control group in these indices ($P<0.05$). The pregnancy outcomes in the observation group were superior to those in the control group ($P<0.05$), the incidence of adverse reactions was lower in the observation group ($P<0.05$), and the overall clinical efficacy was higher in the observation group ($P>0.05$). In conclusion, comprehensive treatment combining traditional Chinese and Western medicine can improve pregnancy outcomes in PCOS patients and is worthy of promotion.

Keywords: polycystic ovary syndrome, integrated traditional Chinese and western medicine treatment, pregnancy outcomes, sex hormones, endometrial receptivity

1. Introduction

Polycystic ovary syndrome (PCOS) is a disorder of the endocrine and metabolic systems, commonly occurring in women of reproductive age and adolescents. According to relevant statistics [1], the number of PCOS patients in China reaches as high as 15 million. PCOS is a major cause of anovulation or infrequent ovulation, severely affecting the physical and mental health of patients. Some patients also experience infertility, significantly increasing their psychological stress. Due to the diverse etiologies of PCOS, modern clinical treatment plans are varied, making the effective treatment of PCOS a key focus of current research. Currently, the clinical treatment of PCOS generally involves the use of ovulation induction drugs, with clomiphene being the most commonly used medication. This drug can increase follicle growth and ovulation efficiency but can inhibit endometrial growth, affecting the growth rate of the fetus within the uterine cavity after successful conception. Overall, the pregnancy rate with clomiphene is relatively low, and long-term use can cause many adverse reactions in patients [2]. With the increasing emphasis on the concept of integrated traditional Chinese and Western medicine, the primary pathogenesis of PCOS from the perspective of traditional Chinese medicine (TCM) is kidney deficiency, spleen deficiency, and qi stagnation with blood stasis. The main principles of TCM treatment for this disease are to tonify the kidney, resolve phlegm, remove dampness, regulate qi, and clear heat [3]. In treating PCOS patients with integrated traditional Chinese and Western methods, it is essential to base the treatment on tonifying the kidney, implementing syndrome differentiation and treatment to improve pregnancy outcomes [4]. This study aims to analyze the effectiveness of integrated traditional Chinese and Western medicine treatment by selecting 60 PCOS patients admitted to our hospital from January 2022 to April 2023. The research is presented as follows.

2. Materials and Methods

2.1. General information

Sixty patients with polycystic ovary syndrome (PCOS) admitted to our hospital between January 2022 and April 2023 were selected and randomly divided into two groups. The control group (n=30) received conventional Western medical treatment. Their ages ranged from 20 to 35 years, with an average age of (28.65±2.16) years. The disease duration ranged from 1 to 4 years, with an average duration of (2.98±0.65) years. Five patients had a history of alcohol consumption, and two had a history of smoking. Their BMI ranged from 22.21 to 26.98 kg/m², with an average BMI of (24.35±0.94) kg/m². The observation group (n=30) received integrated traditional Chinese and Western medicine treatment. Their ages ranged from 20 to 36 years, with an average age of (28.98±2.20) years. The disease duration ranged from 1 to 4 years, with an average duration of (3.01±0.67) years. Six patients had a history of alcohol consumption, and two had a history of smoking. Their BMI ranged from 22.18 to 27.02 kg/m², with an average BMI of (24.50±0.91) kg/m². There were no significant differences in general information between the two groups (P>0.05).

Inclusion Criteria: 1. Diagnosed with polycystic ovary syndrome through comprehensive clinical diagnosis; 2. No other medication treatment within one month prior to the study; 3. Women of reproductive age with fertility needs; 4. Complete clinical data; 5. Informed consent signed by patients and their families.

Exclusion Criteria: 1. Patients with mental illnesses; 2. Patients with cardiovascular and cerebrovascular dysfunction; 3. Patients with malignant tumors; 4. Patients with liver or kidney abnormalities; 5. Patients allergic to the medications used in this study.

2.2. Methods

Before treatment, patients underwent hormone and blood routine tests, and their heart rate, blood pressure, height, and weight were monitored.

Control Group: Conventional Western medical treatment: Clomiphene citrate was administered on the fifth day after menstruation ended, at a dose of 50 mg once daily for five days. Follicle condition was monitored via ultrasound once daily for five days. If the follicle diameter reached 18-20 mm, patients could engage in sexual intercourse. If ovulation did not occur in the first cycle, the second cycle involved taking 100 mg of clomiphene per day, with the same procedures as the first cycle, for three cycles.

Observation Group: Integrated traditional Chinese and Western medicine treatment: The Western medicine treatment was the same as described above. The traditional Chinese medicine (TCM) treatment included three basic prescriptions: 1. Kidney-Nourishing Ovulation Soup: Ingredients: 10g Angelica sinensis, Paeonia lactiflora, Cuscuta chinensis, Cornu Cervi Pantotrichum, Ziyin Stone; 15g Rehmannia glutinosa, Ligustrum lucidum, Lycium barbarum, Cistanche deserticola, Cornus officinalis, Dioscorea opposita, Pseudostellaria heterophylla. Additional herbs were added based on specific symptoms: Curculigo orchioides, Psoralea corylifolia, and Epimedium brevicornu for kidney yang deficiency; Lycium barbarum, Rosa laevigata, Cornus officinalis for severe kidney yin deficiency; Atractylodes macrocephala, Astragalus membranaceus, Codonopsis pilosula for severe spleen deficiency; Polygonatum sibiricum, Spatholobus suberectus for blood deficiency; Taxillus chinensis, Eucommia ulmoides, Dipsacus asper for lumbago; Atractylodes lancea, Pinellia ternata, Citrus reticulata for obesity and phlegm; Curcuma aromatica, Bupleurum chinense, Cyperus rotundus for liver qi stagnation. One dose per day, decocted to 200 ml, taken 100 ml twice daily, starting on the fifth day of the menstrual cycle for six days. 2. Kidney-Warming Luteal Soup: Ingredients: 15g Dioscorea opposita, Cistanche deserticola, Morinda officinalis, Epimedium brevicornu, Rubus chingii, Rosa laevigata, Taxillus chinensis, Lycium barbarum, Pseudostellaria heterophylla; 10g Cuscuta chinensis, Cornu Cervi Pantotrichum, Curculigo orchioides. One dose per day, decocted to 200 ml, taken 100 ml twice daily, starting on the 17th day of the menstrual cycle for six days. 3. Blood-Activating and Qi-Regulating Ovulation Soup: Ingredients: 10g Lycopus lucidus, Bupleurum chinense, Cyperus rotundus, Salvia miltiorrhiza, Lycium barbarum, Vaccaria segetalis, Cuscuta chinensis, Carthamus tinctorius; 15g Ligustrum lucidum, Paeonia obovata, Paeonia lactiflora, Spatholobus suberectus; 12g Rosa rugosa. One dose per day, decocted to 200 ml, taken 100 ml twice daily, starting on the 11th day of the menstrual cycle for six days.

2.3. Observation indicators

1) Sex hormone levels, 2) Endometrial receptivity indices, 3) Pregnancy outcomes, 4) Incidence of adverse reactions, 5) Overall treatment efficacy, 6. TCM syndrome scores.

2.4. Statistical analysis

Data were analyzed using SPSS18.0 statistical software. Measurement data conforming to a normal distribution were expressed as mean ± standard deviation ($\overline{X}$ ±s) and analyzed using the t-test. Count data were expressed as percentages (%) and analyzed using the chi-square test. A P-value of <0.05 was considered statistically significant.

3. Results

3.1. Comparison of sex hormone levels

Before treatment, there was no significant difference in sex hormone levels between the two groups (P>0.05). After treatment, the sex hormone levels in the observation group were superior to those in the control group (P<0.05), as shown in Table 1.

Table 1. Comparison of sex hormone levels ($\overline{X}$ ±s)

Group	Cases	T（mmol/L）		FSH（U/L）		LH（U/L）		E2（pmol/L）	
		Before	After	Before	After	Before	After	Before	After
Observation	30	2.20±0.43	1.20±0.28	5.50±0.85	9.84±1.43	8.45±1.53	4.80±1.21	217.16±70.46	116.25±38.43
Control	30	2.23±0.46	1.55±0.35	5.56±0.83	7.13±1.22	8.60±1.60	6.65±1.18	218.65±71.68	165.35±43.67
t	-	0.261	4.277	0.277	7.897	0.371	5.995	0.081	4.623
P	-	0.795	0.000	0.783	0.000	0.712	0.000	0.936	0.000

3.2. Comparison of endometrial receptivity indices

Before treatment, there was no significant difference in endometrial receptivity indices between the two groups (P>0.05). After treatment, the endometrial receptivity indices in the observation group were superior to those in the control group (P<0.05), as shown in Table 2.

Table 2. Comparison of endometrial receptivity indices ($\overline{X}$ ±s)

Group	Cases	Endometrial Thickness (mm)		Endometrial Solvent (U/L)		PI（U/L）		RI（ml/min）	
		Before	After	Before	After	Before	After	Before	After
Observation	30	5.45±0.29	9.24±0.37	3.01±0.65	3.99±0.63	2.20±0.11	2.99±0.22	0.40±0.10	0.84±0.11
Control	30	5.49±0.28	8.01±0.32	2.89±0.67	3.53±0.49	2.17±0.10	2.65±0.18	0.41±0.13	0.71±0.08
t	-	0.543	13.772	0.704	3.157	1.105	6.551	0.334	5.235
P	-	0.589	0.000	0.484	0.003	0.274	0.00	0.740	0.000

3.3. Comparison of pregnancy outcomes

The pregnancy outcomes in the observation group were superior to those in the control group (P<0.05), as shown in Table 3.

Table 3. Comparison of pregnancy outcomes [n (%)]

Group	Cases	Successful Pregnancy Rate	Natural Abortion Rate	Gestational Diabetes	Pregnancy-Induced Hypertension
Observation	30	12（40.0）	1（3.3）	1（3.3）	1（3.3）
Control	30	5（16.7）	4（13.3）	6（20.0）	3（10.0）
X^2	-	4.022	1.964	4.043	1.071
P	-	0.045	0.161	0.044	0.301

3.4. Comparison of adverse reaction rates

The incidence of adverse reactions in the observation group was lower than in the control group (P<0.05), as shown in Table 4.

Table 4. Comparison of Adverse Reaction Rates [n (%)]

Group	Cases	Liver and Kidney Dysfunction	Skin Reactions	Gastrointestinal Reactions	Menstrual Abnormalities	Headache	Incidence Rate
Observation	30	1	0	1	0	0	2（6.7）
Control	30	3	1	2	2	2	10（33.3）
X^2	-						6.667
P	-						0.010

3.5. Comparison of overall treatment efficacy

The observation group had an overall treatment efficacy of 90.0% (27/30), with 19 cases showing significant effect, 8 cases showing effect, and 3 cases showing no effect. The control group had an overall treatment efficacy of 60.0% (18/30), with 13 cases showing significant effect, 5 cases showing effect, and 12 cases showing no effect. The difference between the two groups was statistically significant ($P<0.05$).

3.6. Comparison of TCM syndrome scores

Before treatment, the TCM syndrome scores were (89.98±6.75) in the observation group and (90.35±6.82) in the control group, with no significant difference ($P>0.05$). After treatment, the scores were (46.01±5.62) in the observation group and (55.38±7.78) in the control group, with the observation group showing significantly better improvement ($P<0.05$).

4. Discussion

The main clinical features of polycystic ovary syndrome (PCOS) include elevated serum insulin levels and elevated serum androgen levels, which cause disruptions in both the endocrine and metabolic systems of the patient [5]. When patients develop PCOS, they experience numerous short- and long-term complications, which can affect women of reproductive age, leading to a high probability of anovulation or reduced ovulation [6]. Currently, clomiphene is commonly used in clinical practice to treat this condition. However, this drug requires long-term use by patients, leading to numerous adverse reactions, and does not significantly increase pregnancy rates [7].

At present, the combined therapy of traditional Chinese and Western medicine is widely used in the treatment of PCOS. From the perspective of traditional Chinese medicine (TCM), PCOS falls into the category of amenorrhea and infertility and is closely related to spleen deficiency, kidney deficiency, liver deficiency, and blood stasis with phlegm-dampness. Under the combined action of these factors, patients exhibit a pattern of deficiency in the root and excess in the branch, where the root is spleen and kidney deficiency, and the branch is phlegm-dampness with blood stasis. Clinical treatment follows the principles of tonifying the kidney, strengthening the spleen, soothing the liver, and eliminating dampness [8]. This study found that the pregnancy outcomes and other indicators in the observation group were superior to those in the control group. The reasons are as follows: clomiphene, a commonly used ovulation-promoting drug, further inhibits the activity of estrogen receptors in the hypothalamus, thereby increasing the levels of follicle-stimulating hormone (FSH) and luteinizing hormone (LH) secretion, significantly accelerating the growth and maturation of follicles [9]. Once the follicles mature, the positive feedback mechanism significantly stimulates the release of gonadotropins, thus accelerating the ovulation rate. However, clomiphene has certain drawbacks; it can inhibit estrogen secretion, particularly reducing the growth rate of the endometrium, which can impair fetal growth and development indicators [10]. The integrated traditional Chinese and Western medicine therapy used in this study included three herbal decoctions: Kidney-Nourishing Ovulation Soup, Kidney-Warming Luteal Soup, and Blood-Activating and Qi-Regulating Ovulation Soup. These decoctions, used at different stages of follicle development, provide effects such as resolving phlegm, soothing the liver, tonifying the kidney, and strengthening the spleen, and can prevent infertility to some extent [10]. The Blood-Activating and Qi-Regulating Ovulation Soup, used from the 11th day of the menstrual cycle, effectively promotes ovulation. The Kidney-Nourishing Ovulation Soup, containing herbs like Paeonia obovata, Cyperus rotundus, Salvia miltiorrhiza, Carthamus tinctorius, and Vaccaria segetalis, works together to promote blood circulation and regulate qi. Research has shown that Carthamus tinctorius and Vaccaria segetalis increase the quantity of ovulated follicles [11]. When the corpus luteum is formed, the Kidney-Warming Luteal Soup, containing herbs such as Cistanche deserticola, Rubus chingii, Morinda officinalis, and Cuscuta chinensis, provides beneficial effects of warming and tonifying the kidney and liver. Using this decoction from the 17th day of the menstrual cycle increases the efficiency of corpus luteum formation and ensures regular estrogen release, maintaining menstrual regularity. The combined effects of these three decoctions accelerate follicle discharge, increase the implantation rate of fertilized eggs, and enhance fetal growth and development [12]. Moreover, these herbal treatments not only improve follicle generation and ovulation efficiency but also significantly enhance the levels of sex hormones and the uterine environment, helping patients quickly return to normal menstrual status. This avoids overstimulation of the fertilized egg and fetus, promoting embryo implantation and development, thus

significantly increasing pregnancy rates [13]. Additionally, the integrated treatment of Chinese and Western medicine offers high safety, allowing for reasonable adjustments based on the patient's physical and disease condition, thereby alleviating symptom severity and reducing discomfort, which in turn lowers the incidence of adverse reactions [14].

In summary, comprehensive treatment combining traditional Chinese and Western medicine can enhance clinical outcomes, improve pregnancy results, and ensure treatment safety for patients with PCOS. This method is highly valuable and worth promoting.

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