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Correlates of Traditional Chinese Medicine Syndrome Types in Polycystic Ovary Syndrome

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Abstract

Objective Polycystic ovary syndrome (PCOS), a common female health condition caused by a hormonal imbalance due to the ovaries producing excess male hormones, is also considered a chronic endocrine–metabolic syndrome. According to the traditional Chinese medicine (TCM) theory, multiple factors including insufficiency of kidney and liver as well as phlegm dampness may result in PCOS. This study aimed to investigate the distribution pattern of TCM syndrome types in patients with PCOS, and to determine the glucose metabolism status among these patients. **Methods** A total of 60 patients diagnosed with PCOS in our center were enrolled in this study. These patients were classified into three groups based on their TCM syndrome types, including phlegm dampness syndrome, liver stagnation syndrome, and kidney insufficiency syndrome. A uniformly formulated basic information sheet was collected, and all of them underwent glucose tolerance test (OGTT). The correlations of body mass index (BMI), waist to hip ratio (WHR), and glucose metabolism in patients with different syndromes were compared. **Results** The patients with phlegm dampness syndrome type (n=32) were the most among these 60 patients with PCOS, accounting for 53.33%, followed by liver stagnation syndrome (n=18; 30%) and kidney insufficiency syndrome (n=10; 16.67%). The BMI and WHR of patients with phlegm dampness syndrome were higher than those with liver stagnation syndrome and kidney insufficiency syndrome ($P<0.01$). There was no significant difference in the incidence of abnormal glucose metabolism (IFG/IGT/diabetes) among the three groups ($P>0.05$). **Conclusions** The main TCM syndrome type in patients with PCOS is phlegm dampness syndrome, which was linked to obesity and abdominal obesity.

Keywords: PCOS, traditional Chinese medicine; Glucose metabolism; Obesity

1. INTRODUCTION

Polycystic ovary syndrome (PCOS) is considered a chronic endocrine-metabolic syndrome. It is a common female health condition caused by a hormonal imbalance due to the ovaries producing excess male hormones [1]. PCOS is characterized by diverse pathogenic factors, diverse clinical manifestations, and involves multiple systems of the human body. So far, there is no disease name corresponding to PCOS in traditional Chinese medicine (TCM). Traditionally, according to its clinical manifestations, PCOS can be treated from the aspects of "late menstruation", "amenorrhea" and "infertility". In terms of the morphology of ovarian polycystic changes, it can be classified into the category of "Zheng jia" [2]. In recent years, progress has been made using traditional Chinese medicine to treat PCOS. In this study, we aimed to explore the distribution pattern of different TCM syndrome types of PCOS, which could be beneficial for clinical diagnosis and treatments of PCOS.

2. MATERIALS AND METHODS

2.1 Research participants

A total of 60 patients diagnosed with PCOS were collected from the outpatient clinic of the Department of Gynecology in the First Affiliated Hospital of Guangzhou University of Traditional Chinese Medicine. The youngest was 20 years old and the oldest was 35 years old. Their basic information, including age, height, weight, menstrual history, and TCM syndrome analysis were collected. Body mass index (BMI) and waist-to-hip ratio (WHR) were calculated. Glucose tolerance test (OGTT) was performed.

2.2 PCOS diagnostic criteria

According to the Rotterdam consensus [3], PCOS is defined by the presence of 2 of 3 of the following criteria including oligo-anovulation, hyperandrogenism, and polycystic ovaries (12 follicles measuring 2–9 mm in diameter and/or an ovarian volume > 10 mL in at least one ovary).

2.3 Diagnosis standard of TCM syndromes

According to the "Guidelines for Clinical Research of New Chinese Medicines for the Treatment of Irregular Menstruation" (2002 Edition) and "Traditional Chinese Medicine Gynecology" (7th Edition) issued by the Ministry of Health of the People's Republic of China, the included patients are divided into kidney insufficiency syndrome, liver stagnation syndrome, or phlegm-dampness syndrome.

2.4 Glucose metabolism status

According to the diagnostic criteria for diabetes mellitus (DM) recommended by WHO in 1999, the criteria for normal glucose tolerance are fasting blood glucose FPG < 6.1 mmol/L, OGTT 2h blood glucose < 7.8 mmol/L. The diagnostic criteria for diabetes mellitus (DM) are fasting blood glucose ≥ 7.0 mmol/L, and/or OGTT 2h blood glucose ≥ 11.1 mmol/L. Impaired fasting blood glucose (IFG) was defined as fasting blood glucose ≥ 6.1 mmol/L, < 7.0 mmol/L, and OGTT 2h blood glucose < 7.8 mmol/L. Impaired glucose tolerance (IGT) was

defined as OGTT 2h blood glucose ≥ 7.8 mmol/L, < 11.1 mmol/L, and fasting blood glucose < 7 mmol/L.

2.5 Statistical analysis

The SPSS 20.0 software was used for data statistical processing, and quantitative data were expressed as mean \pm standard deviation (mean \pm SD). The normal distribution and the homogeneity of variance were checked by variance analysis. The LSD method of multiple comparisons was used for pairwise comparison between groups, and a p value less than 0.05 was considered as statistically significant. The enumeration data were expressed by the composition ratio or rate (%), and the test method was chi-square test or Fisher's exact test.

3. RESULT

3.1 Distribution pattern of different TCM syndrome types in PCOS patients

As shown in Table 1, there were significant differences in the distribution of three TCM syndrome types in PCOS patients ($P < 0.01$), with phlegm dampness syndrome being the most common (53.33

Table 1. Different TCM syndrome types in patients with PCOS

TCM syndrome types	Case (n)	Proportion (%)	P value
Phlegm dampness syndrome	32	53.33	0.002
Liver stagnation syndrome	18	30	
Kidney insufficiency syndrome	10	16.67	

3.2 BMI and WHR among the three groups with different TCM syndrome types

As shown in Table 2, there was no significant difference in terms of age among these three syndrome types ($P > 0.05$). However, the BMI and WHR of patients with phlegm dampness syndrome were significantly higher than those with liver stagnation syndrome and kidney insufficiency syndrome ($P < 0.01$). The average BMI level of patients with phlegm dampness syndrome was greater than 25 kg/m^2 , and the mean value of WHR was greater than 0.85, indicating that the obesity, especially abdominal obesity, was linked to the phlegm dampness syndrome in PCOS patients.

Table 2. Age, BMI and WHR among the three groups with different TCM syndrome types

Parameters	Phlegm dampness syndrome (n=32)	Liver stagnation syndrome (n=18)	Kidney insufficiency syndrome (n=10)	F value	P value
Age	27.53 \pm 3.54	25.56 \pm 2.38	25.30 \pm 3.62	3.038	0.056
BMI	26.99 \pm 3.18*	20.37 \pm 2.17	20.59 \pm 2.06	42.194	<0.001
WHR	0.92 \pm 0.07*	0.80 \pm 0.06	0.81 \pm 0.04	25.854	<0.001

Note: * $P < 0.05$ compared with other two groups; BMI: body mass index; WHR: waist hip ratio

3.3 Glucose metabolism status among three groups

As shown in Table 3, there was no significant difference in the incidence of abnormal glucose metabolism (IFG/IGT/diabetes) among the three groups ($P>0.05$).

Table 3. Comparison of glucose metabolism status among three groups

Parameters	Phlegm dampness syndrome (n=32)	Liver stagnation syndrome (n=18)	Kidney insufficiency syndrome (n=10)	Total	P value
Normal glucose tolerance	19(59.38)%	15(83.33)%	880.00)%	4270.00)%	0.156
IFG/IGT	12(37.50%)	316.67%	220.00%	1728.33%	-
Diabetes	13.12%	0	0	11.67%	-

Note: IFG: Impaired fasting blood glucose; IGT: Impaired glucose tolerance

4. DISCUSSION

According to TCM theory, the pathogenesis of PCOS can be summarized as dysfunction of the kidney, spleen and liver. Pathogenic factors such as phlegm dampness and blood stasis cause the dysfunction of the kidney-tianguai-chongren-uterine axis. The kidney stores essence, the liver stores blood, and the spleen controls blood. The three essences and blood are intertwined. The kidney governs storage, the liver governs dredging, and the spleen governs transportation and transformation. These three functions are interoperable. Different doctors have different emphasis on pathogenesis, and the clinical syndrome differentiation and classification sometimes are not the same. In this study, we divided PCOS patients into three groups according to their TCM syndrome types, including kidney insufficiency syndrome, liver stagnation syndrome and phlegm dampness syndrome. Among them, patients with the phlegm dampness syndrome were the most, followed by liver stagnation syndrome and kidney insufficiency syndrome. There were statistical differences in the distribution of syndrome types.

In this study, the BMI and WHR of PCOS patients with phlegm dampness syndrome were significantly higher than those of patients with liver stagnation syndrome and kidney insufficiency syndrome. Their average BMI was greater than 25 kg/m², and their average WHR was greater than 0.85, indicating that these patients had obesity and abdominal obesity. Traditional Chinese medicine scientists have long recognized that obesity and phlegm dampness are closely related, and it has been also recognized that "phlegm dampness block" could be the main pathogenesis that leads to irregular menstruation and infertility. As "Danxi Xinfa-Children" wrote, "If a fat woman eats a lot of grain and likes wine, her menstrual water may not be adjusted, and she will not be able to conceive. In other words, when the body is full of fat, the uterus can be blocked." This lays a theoretical basis for treating PCOS from phlegm dampness.

Although the patients with liver stagnation syndrome and kidney insufficiency syndrome are in the healthy weight range from the perspective of BMI. But their mean WHR level was 0.80, indicating that there is a risk of abdominal obesity. Modern medical studies have shown that BMI and WHR are independent risk factors for glucose metabolism disorders. In this study, some patients in the three groups had impaired glucose tolerance and even reached

the stage of diabetes. There was no statistical difference in the proportion of abnormal glucose metabolism (IFG, IGT, diabetes) among the three groups. Similarly, Fu Huijia *et al.* [4] divided 510 cases of PCOS into four syndrome types (kidney-yang insufficiency, spleen-yang insufficiency, liver stagnation transforming into heat, and kidney-yin insufficiency), but no significant difference was observed in terms of metabolism parameters. Zhang Wenhua *et al.* reported [5] that the incidence of abnormal glucose metabolism in PCOS patients was 39.60%. More attention should be paid to the glucose metabolism of PCOS patients with different TCM syndromes to draw a conclusive result.

Due to the limited source and time of collecting PCOS cases, this study has several shortcomings, such as a small sample size, a narrow age span of patients, and a lack of statistical analysis of PCOS patients of all ages. More comprehensive clinical studies are warranted to link the TCM syndromes types to PCOS.

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