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Risk factors of polycystic ovarian syndrome among Li People

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ABSTRACT

Objective: To study the relevant risk factors of polycystic ovarian syndrome (PCOS) of Li People so as to provide basis for early diagnosis and treatment of PCOS.
Methods: With case–control study method, 285 cases of PCOS of Li People were as recruited case group, and 580 cases of non-PCOS of female Li People as control group. Questionnaire was adopted to collect data regarding risk factors of PCOS, then the risk factors of PCOS was searched by univariate and multivariate analysis.
Results: Multivariate analysis showed that the risk factors of PCOS included in menstrual cycle disorder (*OR* = 5.824), bad mood (*OR* = 2.852), family history of diabetes (*OR* = 7.008), family history of infertility (*OR* = 11.953), menstrual irregularity of mother (*OR* = 2.557) and lack of physical exercise (*OR* = 1.866).
Conclusions: To target the high risk factors of menstrual cycle disorder, family history of diabetes, family history of infertility, family history of diabetes, bad mood and lack of physical exercise of female population, we should implement early screen, diagnose and treatment of POCS in order to reduce the incidence rate of PCOS and improve prognosis of PCOS.

1. Introduction

Polycystic ovarian syndrome (PCOS), featuring problematic follicular development, is an endocrine system disorder that has life-long impact upon its patients. Prevalence of PCOS among women at reproductive age was reported to be 5%–10% [1]. The disease is characterized by oligomenorrhea or amenorrhea, unovulation, insulin resistance (IR), hyperandrogenemia and cysts on the ovaries [2] and deemed as one of the main cause of anovulatory infertility. It does a lot of harm to women's physical and mental health. Etiology of PCOS is still unknown and prevalence of this disease varies due to the differences in genetic traits and living environment of its victims. The Hainan province is a tropical island on which multiple ethnic groups including Han People and Li People live. Territorial clustering of habitation provides favorable condition for research of the prevalence and risk factor of PCOS among the Li ethnic minority population in Hainan, China. With case–control study design, this study investigate the risk factors of PCOS among female Li People at reproductive age living in the Hainan province to inform decision making regarding early screen and preventive measures against PCOS.

2. Materials and methods

2.1. Sample of the study

Of 285 cases were recruited from hospitalized patients from January 2014 to December 2014 in four of the cities or counties of the Hainan province, namely Lingshui, Qiongzhong, Changjiang, and Sanya, where Li population is concentrated. All cases met the diagnosis criteria of PCOS published by the Chinese Ministry of Health, which defines a PCOS patient as one who must have symptoms of oligomenorrhea and amenorrhea or abnormal uterine bleeding as well as one of the two following symptoms: hyperandrogenism and polycystic ovaries. Other cause of hyperandrogenism and polycystic ovaries must be excluded to make the diagnosis. Patients with malignant tumor, cardiovascular disease, server organic disease, and

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psychiatric issues were excluded from the sample. Of 580 cases of non-PCOS of female Li People were sampled from those hospitals during the same time period. Hospital ethic committees approved the study and all subjects had signed the informed consent form.

2.2. Data collection

Self-designed questionnaire was handed out among case and control groups. Data collected include patients' age, address, BMI, age of menarche, length of period cycle, gravida, parity, marital status, education, vocation, menstrual disorder, alcohol intake, tea drinking, mood, family relationship, family history of PCOS, family history of diabetes, family history of infertility, mother's irregular menstruation and lack of physical exercise. Data of other PCOS-related conditions including hirsutism, acne, skin conditions and ultrasound findings of ovarian were also obtained. Biochemistry tests for testosterone (Testo), luteotropic hormone (LH), Follicle-stimulating hormone (FSH), Insulin (INS), glucose (GLU) and so on were carried out using automatic biochemistry analyzers and chemiluminescence analyzers.

2.3. Statistical analysis

Epidata 3.02 was employed for double data entry in order to ensure the quality of data record. All the data were analyzed by statistical software of SPSS 18.0. *Chi*-square test and *t* test were used to respectively analyze measurement data and enumeration data. Multivariate Logistic Regression was performed to adjust for impacts of multiple factors, and using of stepwise method to screen model. $P < 0.05$ is defined as statistically significant in this study.

3. Results

3.1. Univariate analysis of risk factors for PCOS

Results of chi-square analysis was shown in Table 1 and it can be interpreted that age, gravida, parity, marital status, education, vocation, irregular menstruation, alcohol, tea drinking, bad mood, family relationship, family history of PCOS, family history of diabetes, family history of infertility and mother's irregular menstruation were all significantly related to the incidence of PCOS.

3.2. Multivariate analysis on risk factors for PCOS

With incidence of PCOS as the dependent variable($y_{control}$ = 0,y_{case} = 1) and the 16 variables selected by the univariate analysis as independent variables, multivariate logistic regression were performed using step-wise method to confirm the risk factors for PCOS. Study results reported in table revealed that irregular menstruation, bad mood, family history of infertility and diabetes, mother's irregular menstruation, unpleasant mood,

Table 1
Chi-square analysis of risk factors for PCOS.

Variables	Measurement	Control (n = 580)	Case (n = 285)	χ^2	P
Age	Year	29.67 ± 6.97	28.50 ± 6.86	2.335	0.020
BMI	kg/m^2	20.42 ± 3.00	20.50 ± 2.71	–0.353	0.724
Age of menarche	Year	14.39 ± 1.23	14.30 ± 1.27	0.998	0.319
Length of the period	Days	5.00 ± 1.54	4.93 ± 1.36	0.656	0.512
Gravida	Count	1.77 ± 1.10	1.37 ± 1.14	4.899	0.000
Parity	Count	1.26 ± 0.99	0.81 ± 0.99	6.223	0.000
Marital status	Married	10 (1.7%)	17 (6.0%)	11.365	0.001
	Unmarried	570 (98.3%)	268 (94.0%)		
Education	Primary	142 (24.5%)	50 (17.5%)	11.985	0.007
	Middle school	419 (72.2%)	217 (76.1%)		
	High school	14 (2.4%)	17 (6.0%)		
	College and above	5 (0.9%)	1 (0.4%)		
Vocation	Unemployed	34 (5.9%)	25 (8.8%)	6.374	0.041
	Peasant	533 (91.9%)	247 (86.7%)		
	Other	13 (2.2%)	13 (4.6%)		
Abnormal menstruation	No	490 (84.5%)	105 (36.8%)	202.006	0.000
	Yes	90 (15.5%)	180 (63.2%)		
Alcohol intake	Occasionally	356 (61.4%)	101 (35.4%)	51.603	0.000
	Frequently	224 (38.6%)	184 (64.6%)		
Tea drinking	Occasionally	409 (70.5%)	250 (87.7%)	31.167	0.000
	Frequently	171 (29.5%)	35 (12.3%)		
Bad mood	No	537 (92.6%)	223 (78.2%)	36.849	0.000
	Yes	43 (7.4%)	62 (21.8%)		
Family relationship	Good	398 (68.6%)	171 (60.0%)	6.309	0.012
	Bad	182 (31.4%)	114 (40.0%)		
Family history of PCOS	No	574 (99.0%)	275 (96.5%)	6.444	0.011
	Yes	6 (1.0%)	10 (3.5%)		
Family history of diabetes	No	571 (98.4%)	249 (87.4%)	47.570	0.000
	Yes	9 (1.6%)	36 (12.6%)		
Family history of infertility	No	576 (99.3%)	244 (85.6%)	72.689	0.000
	Yes	4 (0.7%)	41 (14.4%)		
Mother's irregular menstruation	No	502 (86.6%)	193 (67.7%)	42.921	0.000
	Yes	78 (13.4%)	92 (32.3%)		
Lack of physical exercise	No	159 (27.4%)	43 (15.1%)	16.221	0.000
	Yes	421 (72.6%)	242 (84.9%)		