Investigation of Female Menopausal Syndrome and Cognition of Hormone Replacement Therapy

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Abstract: *Objective:* To investigate the incidence of female menopausal syndrome and the cognition of hormone replacement therapy (HRT), providing a basis for interventions for menopausal syndrome in women. *Methods:* From October 2021 to June 2023, a survey was conducted mainly in Guangzhou's Huangpu District, using a cluster random sampling method to select 3,000 women who voluntarily participated. A questionnaire was used to collect general information about the participants and their awareness of HRT. *Results:* All 3,000 participants completed the questionnaire. The majority were aged 46–50 (51.90%), most were workers (24.40%), had a high school education (40.17%), and were married (91.20%). The most common symptoms of menopausal syndrome were insomnia, fatigue, and joint/muscle pain, with prevalence rates of 71.23%, 66.57%, and 63.57%, respectively, significantly higher than other symptoms ($P < 0.05$). Other symptoms included depression, mood swings, palpitations, hot flashes, and sweating. Among the participants, 64.93% were unaware of HRT, 11.63% had heard of it, 9.40% were very familiar with it, and 14.03% had used it. Healthcare professionals were the main source of HRT knowledge for the participants, with other sources including the internet, friends, media, and lectures. The moderate and severe symptom groups included 1,832 and 1,168 participants, respectively. In the severe group, follicle-stimulating hormone and luteinizing hormone levels were significantly higher than in the moderate group ($P < 0.05$), and estradiol levels were significantly lower than in the moderate group ($P < 0.05$). *Conclusion:* The incidence of menopausal syndrome is high among middle-aged women, with common symptoms including insomnia, fatigue, and joint/muscle pain. These symptoms may be related to hormone levels. Many women lack awareness of HRT for the menopausal syndrome, with healthcare professionals being the primary source of information. To ensure women's physical and mental health, it is necessary to strengthen education and raise awareness of health care, emphasizing early prevention and intervention to improve the quality of life for middle-aged and elderly women.

Keywords: Perimenopausal syndrome; Perimenopause; Hormone therapy; Women's health

1. Introduction

Menopause is a traditional term referring to the perimenopausal period. Most women entering menopause

experience a range of symptoms due to their inability to regulate through their neuroendocrine-immune system. The sudden decrease in estrogen disrupts the body's balance, leading to typical menopausal symptoms such as mood swings, hot flashes, sweating, and urogenital atrophy, seriously impacting women's physical and mental health [1]. Perimenopausal syndrome patients are often influenced by traditional beliefs, and the lack of widespread knowledge about health care during the menopausal transition in China, combined with the fact that perimenopausal issues affect other systems, makes it difficult for patients to determine which medical department to consult [2]. Although research on the menopausal transition is progressing internationally, the acceptance rate among Chinese women remains low, and there is limited understanding of the significance of HRT. Therefore, understanding the symptoms of perimenopausal syndrome and awareness of HRT is important for improving postmenopausal quality of life and advancing health care for menopausal women [3]. Based on this, the current study was conducted in Guangzhou's Huangpu District from October 2021 to June 2023. Using a cluster random sampling method, 3,000 women who voluntarily participated were surveyed to investigate the incidence of menopausal syndrome and the cognition of HRT, providing a basis for interventions for menopausal syndrome in women.

2. Materials and methods

2.1. General information

From October 2021 to June 2023, a survey was primarily conducted in the Huangpu District of Guangzhou, selecting 3,000 women who voluntarily participated in the survey, following the principle of cluster random sampling. The inclusion criteria were: (1) holding household registration in the Huangpu District of Guangzhou or having lived in the district for more than one year; (2) aged between 40 and 60; (3) having a uterus and at least one ovary; (4) being conscious, able to communicate normally, and without motor disabilities affecting writing; (5) being informed about the study and voluntarily participating in the survey. The exclusion criteria were: (1) having serious neurological disorders such as intracranial tumors or severe Parkinson's disease; (2) having been previously diagnosed with drug, alcohol, or substance dependence; (3) having used steroid hormone therapy recently (within the past three months); (4) having atypical endometrial hyperplasia or being diagnosed with endometrial cancer or breast cancer.

2.2. Methods

A self-made questionnaire was used for the survey, in a self-administered format. The participants filled out the questionnaire independently, and any doubts were clarified by the investigators. The survey content included basic information such as age, occupation, education, economic status, menstrual history, and medical history, as well as the participants' knowledge and use of hormone replacement therapy. Menopausal syndrome symptoms were evaluated using a modified Kupperman score. Based on the severity of symptoms, the participants were categorized into a moderate group and a severe group, with a score of 16–30 considered moderate and > 30 considered severe. The serum levels of follicle-stimulating hormone (FSH), luteinizing hormone (LH), and estradiol (E2) were measured and compared between different groups.

2.3. Statistical analysis

The study was analyzed using the SPSS 22.0 statistical software package. Measurement data were expressed as mean ± standard deviation (SD), and inter-group comparisons were conducted using the t-test. Count data were

expressed as [n (%)], and inter-group comparisons were conducted using the chi-squared (χ^2) test. A *P*-value of less than 0.05 was considered statistically significant.

3. Results

3.1. Basic information of the participants

All 3,000 participants completed the questionnaire. The majority were aged 46–50 years (51.90%), most worked as laborers (24.40%), and most had a high school education (40.17%). The majority were married women (91.20%). See **Table 1**.

Table 1. Basic information

Item	Number of people	Proportion (%)
Age (years)		
40–45	777	25.90
46–50	1,557	51.90
51–55	288	9.60
56–60	378	12.60
Occupation		
Laborer	732	24.40
Science and technology	288	9.60
Administrative staff	141	4.70
Finance and accounting	45	1.50
Business services	303	10.10
Teacher	309	10.30
Medical staff	282	9.40
Retired	327	10.9
Other	573	19.10
Education level		
Undergraduate and above	210	7.00
Junior college	302	10.07
Technical school	735	24.50
High school	1,205	40.17
Middle school	867	28.90
Below middle school	548	18.27
Marital status		
Married	2,736	91.20
Divorced	138	4.6
Widowed	75	2.5
Others	51	1.7

3.2. Occurrence of menopausal syndrome symptoms

The most common symptoms of menopausal syndrome among the participants were insomnia, fatigue, and joint and muscle pain, with proportions of 71.23%, 66.57%, and 63.57%, respectively, which were significantly higher than other symptoms ($P < 0.05$). Other symptoms included depression, mood swings, palpitations, hot flashes, and sweating. See **Table 2**.

Table 2. Occurrence of menopausal syndrome symptoms

Symptom	Number of people	Proportion (%)
Hot flashes and sweating	1,753	58.43
Paresthesia	1,095	36.50
Insomnia	2,137	71.23
Irritability	1,689	56.30
Dyspareunia and vaginal dryness	264	8.80
Urgency and frequent urination	1,054	35.13
Depression and mood swings	1,799	59.97
Dizziness	1,542	51.40
Fatigue	1,997	66.57
Joint and muscle pain	1,907	63.57
Headache	878	29.27
Palpitations	1,792	59.75
Skin crawling sensation	556	18.53

3.3. Awareness of hormone replacement therapy

Among the participants, 64.93% were unaware of HRT, 11.63% had heard of it, and 9.40% were very familiar with it. Additionally, 14.03% had used HRT. See **Table 3**.

Table 3. Awareness of hormone replacement therapy

Awareness of HRT	Number of people	Proportion (%)
Very familiar	282	9.40
Heard about it	349	11.63
Unaware	1,948	64.93
Used it	412	14.03

3.4. Sources of information on hormone replacement therapy

Medical professionals were the primary source of information about hormone replacement therapy for the participants, followed by the internet, friends, and media or lectures. See **Table 4**.

Table 4. Sources of information on hormone replacement therapy

Source of information	Number of people	Proportion (%)
Medical professionals	2,426	80.87
Internet	270	9.00
Friends	189	6.30
Media and lectures	115	3.83

3.5. Comparison of serum sex hormone levels between the two groups

There were 1,832 participants in the moderate group and 1,168 in the severe group. The levels of FSH and LH in the severe group were significantly higher than in the moderate group ($P < 0.05$), while the level of E2 was significantly lower in the severe group ($P < 0.05$). See **Table 5**.

Table 5. Comparison of serum sex hormone levels between the two groups (mean ± SD)

Group	n	FSH (mIU/mL)	LH (mIU/mL)	E2 (pmol/L)
Moderate group	1,832	16.78 ± 3.45	19.43 ± 2.83	40.43 ± 5.22
Severe group	1,168	20.43 ± 3.43	22.24 ± 2.84	32.43 ± 5.24
t		28.319	26.482	40.869
P		< 0.001	< 0.001	< 0.001

4. Discussion

Perimenopause refers to the period from the onset of biological, endocrine, and clinical characteristics associated with menopause to one year after menopause. The incidence of perimenopausal syndrome is relatively high, and the symptoms it causes have a serious impact on the quality of life of women [4]. The results of this survey show that the majority of the participants were aged 46–50 years (51.90%), with most working as laborers (24.40%) and having a high school education (40.17%). The majority were married women (91.20%), suggesting that perimenopausal syndrome is related to the occupational environment, education level, and other factors. Studies have shown that the incidence rate is highest among those with a moderate level of education [5]. Other researchers have pointed out that the incidence of menopausal syndrome is positively correlated with education level, with women with lower education levels having a higher incidence compared to those with higher education levels [6]. Women with higher education tend to have broader and more complex knowledge exposure and pay more attention to their health. They are more likely to seek medical intervention when symptoms of perimenopause appear. In contrast, women with lower education levels may have limited access to health knowledge and lack health awareness, potentially viewing menopause and perimenopausal symptoms as natural physiological phenomena and therefore not paying much attention to them [6]. Compared to people engaged in physical labor, those engaged in intellectual work tend to have a higher level of education and a better understanding of perimenopause, which leads them to place more importance on health care during this stage. They may use various methods to alleviate their symptoms [7]. Additionally, the perimenopausal syndrome is also affected by family and social environments, income levels, and other factors [8].

The main reason for emotional changes and psychological disorders in perimenopausal women is that aging of the reproductive endocrine system reduces the body's ability to respond to external stress. The decrease in estrogen is the primary cause of physiological and psychological dysfunction in women [9]. The results of this survey show that the most common symptoms of menopausal syndrome among the participants were insomnia, fatigue, and joint and muscle pain, with proportions of 71.23%, 66.57%, and 63.57%, respectively, which were significantly higher than other symptoms ($P < 0.05$). Other symptoms included depression, mood swings, palpitations, hot flashes, and sweating. Insomnia is the most common perimenopausal symptom among Chinese women, significantly higher than hot flashes and sweating in Western women [10]. Long-term sleep disorders can lead to various diseases, so psychological intervention for perimenopausal women should be emphasized. The results also show that the levels of FSH and LH in the severe group were significantly higher than those in the moderate group ($P < 0.05$), while E2 levels were significantly lower than those in the moderate group ($P < 0.05$), indicating that the symptoms may be related to hormone levels. Testing hormone levels in patients can provide a basis for intervention and evaluation of treatment efficacy. Studies have shown that hormone therapy for perimenopausal women can reduce the risk of insomnia, suggesting that hormone therapy can prevent insomnia [11]. The perimenopausal syndrome can be prevented and treated with HRT, which can also prevent the accelerated progression of diseases like coronary heart disease, osteoporosis, and cognitive decline that occur after menopause [12]. Studies have shown that hormone therapy can alleviate menopausal symptoms and help maintain bone density in women [13]. Other reports have pointed out that HRT can alleviate mood changes, joint and muscle pain, insomnia, and other symptoms associated with menopause [14]. However, many perimenopausal women in China are unaware of hormone replacement therapy. In this study, 64.93% of the participants did not know about HRT, 11.63% had heard of it, 9.40% were very familiar with it, and 14.03% had used it. The main source of information about hormone replacement therapy was medical professionals, indicating that there is a need to strengthen education about hormone therapy.

5. Conclusion

In conclusion, the symptoms of perimenopausal syndrome, such as insomnia, fatigue, and joint and muscle pain, have a high incidence rate and are related to factors such as education level and occupation. Many women with menopausal syndrome are not well-informed about hormone replacement therapy. To ensure women's physical and mental health, it is necessary to strengthen education and awareness about health care and to implement early preventive interventions.

Disclosure statement

The authors declare no conflict of interest.

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