Moxibustion for Perimenopausal Hot Flashes: A Case Report

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Abstract: The aim of this case report is to investigate the effectiveness of moxibustion therapy in perimenopausal hot flashes and its potential mechanisms, which can offer reference for non-hormonal therapies during perimenopause. The patient, a 51-year old woman was amenorrheic for 10 months. She had frequent hot flashes of an average 6 times daily, as well as anxiety, night sweats, and poor sleep. Treatment involved 4 courses of treatment, administered over a period of 8 weeks, comprising moxibustion treatment for 30 minutes with each session being held thrice a week. The main acupoints were Hegu (LI4), Taichong (LR3), Zusanli (ST36), Sanyinjiao (SP6) Qihai(CV6) and Guanyuan(CV4). There were no other medications or interventions applied during the treatment. Treatment effectiveness was evaluated by hot flash diaries, the Kupperman Index and hormone levels (serum estradiol [E2], follical stimulating hormone [FSH], luteinizing hormone [LH]). 8 weeks later, the patient experienced complete resolution of hot flashes, with an average frequency reduction from 6.14 times daily to none. Related anxiety and night sweat were remarkably relieved, and sleep quality and energy state were greatly improved. The levels of E 2 increased from 53 pmol/l to 307 pmol/l, and those of FSH decreased from 40.55 mIU/day to 24.36 mIU/day and LH reduced from 14.7 mIU/ml to 9.13 mIU/ml based on the laboratory test results. The patient also regained menstrual function 10 months after cessation. Moxibustion is an effective intervention for treatment of perimenopausal hot flash and amelioration of sex hormones level, equilibrium, reaction ability and life quality in patients. It may work by affecting the hypothalamic-pituitary-gonadal axis. Considering that moxibustion is safe, easy to perform, and associated with high compliance by patients, it could provide an alternative nonhormonal treatment option for women experiencing perimenopausal hot flushes. But larger scale randomized controlled trials are required to prove its efficacy and working mechanism.

1. Introduction

Perimenopause marks the critical transition from reproductive to postmenopausal years in women, characterized by gradual ovarian decline, reduced estrogen secretion, and endocrine system disruption [1]. Hot flashes represent one of the most prevalent and characteristic symptoms of perimenopause, manifesting as sudden sensations of whole-body heat, sweating, and facial flushing [2]. These are often accompanied by palpitations, anxiety, irritability, and insomnia, significantly impacting women's quality of life and psychological well-being [3]. Epidemiological studies indicate that among women with menstrual irregularities during perimenopause, the incidence of hot flashes can reach as high as 45.5% to 79%. For most patients, symptoms persist for extended periods, causing significant disruption to daily life and work [4].

The most commonly used clinical treatment is hormone replacement therapy (HRT) with estrogen supplementation, which effectively alleviates hot flashes and improves menopause-related discomfort [5]. However, long-term hormone therapy carries potential risks, such as increased incidence of breast cancer, endometrial cancer, and cardiovascular disease, making its safety a major concern [6]. Some patients decline hormone therapy due to concerns about side effects or contraindications, prompting

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clinical researchers to actively explore safe, non-invasive, and highly compliant non-pharmacological therapies.

Moxibustion, a traditional Chinese therapy with over two millennia of clinical application, involves burning mugwort pellets above acupoints. This generates warmth to stimulate meridians, harmonize qi and blood, strengthen the body's defenses, and expel pathogens, thereby achieving therapeutic effects. Modern research indicates that moxibustion regulates neuroendocrine function, improves blood circulation, and stabilizes the autonomic nervous system. Its simplicity, high comfort level, and minimal side effects have led to increasing acceptance among perimenopausal women. Although some studies suggest moxibustion may alleviate perimenopausal hot flashes, clinical evidence remains limited, particularly regarding hormonal changes and potential mechanisms of action.

This study observes and analyzes the specific moxibustion treatment protocol, symptom improvement, and hormonal changes in a perimenopausal patient with hot flashes throughout her complete treatment course. It aims to explore moxibustion's clinical efficacy and potential mechanisms for perimenopausal hot flashes, providing new therapeutic insights and research evidence for clinical practice.

2. Case Information and Diagnostic Basis

Patient, female, 51 years old, presented in March 2024 with "amenorrhea for 10 months and recurrent hot flashes for 5 months [7]." The patient reported episodic hot flashes beginning 5 months prior, occurring approximately 5–6 times daily, often worsening at night or during emotional stress [8]. Symptoms included facial flushing, night sweats, palpitations, irritability, and decreased sleep quality [9]. Symptoms significantly worsened over the past 2 months, impacting daily work and life [10]. The patient has no history of hypertension, diabetes, thyroid disease, or hormone replacement therapy. Gynecological examination revealed atrophy of the vulva, vagina, and cervix, with a small uterine body. Laboratory results: Estradiol (E_2) 53 pmol/L, Follicle-stimulating hormone (FSH) 40.55 mIU/mL, Luteinizing hormone (LH) 14.7 mIU/mL, normal thyroid function. Based on clinical presentation and hormone levels, diagnosed with "Perimenopausal Syndrome (Hot Flash Predominant Type)". To quantitatively assess the degree of improvement in the frequency of hot flash episodes before and after treatment, the following formula was used to calculate the rate of reduction in hot flash frequency:

$$\text{Reduction Rate (\%)} = \frac{F_{pre} - F_{post}}{F_{pre}} \times 100 \quad (1)$$

TCM pattern identification revealed kidney yin deficiency with ascending false fire. Manifestations included hot flashes with sweating, facial flushing, irritability, soreness in the lower back and knees, insomnia with vivid dreams, a red tongue with scanty coating, and a fine, rapid pulse. The pattern was diagnosed as "kidney yin deficiency with ascending false yang." Treatment focused on nourishing yin, reducing fire, harmonizing the Chong and Ren vessels, and unblocking meridians. Based on the theory from Huangdi Neijing Suwen: "At the age of forty-nine, the Ren Meridian becomes deficient, and the Tai Chong Meridian declines," combined with clinical experience, moxibustion was selected to regulate the Chong and Ren Meridians. This aims to restore yin-yang balance, stabilize endocrine function, and thereby alleviate hot flash symptoms.

3. Treatment Method and Process

With diagnosed confirmed and patterns identification, this case adhered to the principle of "pattern identification with individual treatment plan" of TCM, with moxibustion as the main therapy. A customized moxibustion therapy regimen was established based on the unique symptoms, constitution, and condition evolution features of the patient. Holistic and local therapy was stressed, with an emphasis on regulating Chong and Ren meridians and balancing yin-yang as well as taking care of the emotional and constitution matters. To standardize the treatment program and curative effect evaluation, the therapeutic principles, point selection and moxibustion methods of the treatment will

be described at firstand following sections will be given to observation and assessment of clinical effects.

3.1 Treatment Method

Patients receive a total of 4 treatment cycles with three sessions per week lasting 30 min over an integer number of weeks (i.e. 8 weeks). treatment before patients are fully informed of the course of treatment, caution and possible reaction in order to receive full consent from them. During the application it is checked if the patient feels any pain and whether there is a skin reaction to avoid burns or discomfort. No other interventions and medications are given while this session is delivered to ensure that it's a single assessment of moxibustion.

The treatment was in accordance with TCM principles of "tonifying yin and reducing fire, regulating Chong and Ren channels, and opening collaterals." The main purpose was to treat kindey-yin insufficiency leading to the elevation of true yang fire. The duration and strength of moxibustion was adjusted according to the patient's constitution and symptom state in this study, highlighting that individualized intervention is necessary for seeking a trade-off between holistic adjustment and localized acupoint action. This was indicated to restore the balance of yin-yang, regulate endocrine function, and relieve hot flushes, night sweating and insomnia. To objectively measure the overall symptomatic relief of the patients before and after treatment, the improvement rate of Cooperman's index was calculated by the following formula:

$$\text{Improvement Rate (\%)} = \frac{K_{pre} - K_{post}}{K_{pre}} \times 100\% \quad (2)$$

Selected acupoints include Hegu (LI4), Taichong (LR3), Zusanli (ST36), Sanyinjiao (SP6), Qihai (CV6), and Guanyuan (CV4). Point selection is based on meridian theory and modern research evidence, balancing liver-kidney function regulation, Chong-Ren channel unblocking, and strengthening the body's foundation. The moxibustion technique combines indirect moxibustion with suspended moxibustion. Moxibustion tools are placed above the acupoints to stimulate meridian qi and blood circulation through thermal stimulation. Local skin reactions are monitored to ensure safety and efficacy. To visualize the dynamic changes in symptom severity of the patients during the treatment period, the changes in the Kupperman Index (KI) recorded on a weekly basis are shown in Figure 1:

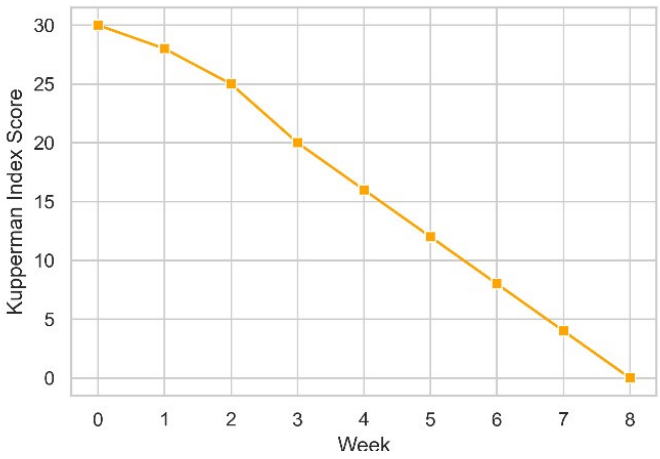

Figure 1 Change in Kupperman index from week to week

Therapeutic efficacy is assessed through patient hot flash diaries and the Kupperman Index, supplemented by serum hormone level testing (E2, FSH, LH) to evaluate symptom improvement and ovarian function changes. Follow-up examinations were conducted after each treatment cycle, documenting adverse reactions and subjective changes to inform subsequent treatment adjustments. Systematic monitoring enabled objective assessment of moxibustion efficacy while providing reference data for analyzing its mechanisms of action.

3.2 Symptom Improvement

After 8-months of moxibustion treatment, the patient felt substantial relief from her hot flashes. He had an average of 6.14 daily hot flash episodes before treatment, and experienced facial flushing, palpitation, and night sweats frequently. Following consistent treatment, the patient claimed "full resolution" of her hot flashes, with daily occurrences decreasing to none. Meanwhile, night sweats were significantly reduced and the patient's quality of life also improved obviously.

Concomitant with the attenuation in hot flashes, emotional status and psychological health of the patient were also improved. The patient was anxious, irritable and had sleep problems that affected his work and life before treatment. After treatment with moxibustion, the restlessness and anxiety level decreased; one hour before sleep, stable emotion and quick falling asleep was reported while the sleep quality was improved markedly. It suggests that moxibustion has the effects in relieving psychological symptoms of perimenopausal syndrome. To accurately analyze the magnitude of change in serum hormone levels before and after treatment, the following formula was applied to calculate the ratio of change in hormone levels:

$$\text{Hormone Change Ratio} = \frac{H_{post} - H_{pre}}{H_{pre}} \quad (3)$$

His physical stamina and work energy improved considerably during the treatment period. With decreased hot flashes and night sweats, the patient developed enhanced physical response power, a better appetite and digestive status during activities, as well as faster recovery from physical activity than before. This also illustrates that the effect of moxibustion is not a focus on local symptoms and signs but on systemic physiological conditions from systemic regulation.

The hot flash dairies were combined with the Kupperman Index scores to quantify improvement of symptoms. Pre- and post-treatment comparisons also indicated a downward trend in the occurrence of hot flashes, night sweats, insomnia, emotional lability; moxibustion might be effective on multi-system perimenopausal symptoms. Preliminary evidence indicates that nondrug therapy is beneficial for clinical intervention.

3.3 Hormonal Level Changes

Before treatment, the patient's serum E2 level was 53 pmol/L, whereas FSH and LH (40.55 mIU/mL and 14.7 mIU/mL) showed decreased ovarian function and endocrinal disorder. A decline in estrogen was significantly correlated with the patient's hot flushes, night sweats and disturbed sleep degree, which suggested a definite correlation between her perimenopausal syndrome symptoms and changes of sex hormones.

The serum hormone levels in the patient after eight moxibustion treatments were apparently better than those before treatment. The levels of E2 increased to 307 pmol/L, FSH decreased to 24.36 mIU/mL and LH declined to 9.13 mIU/mL or partial recovery of the ovarian function and a tendency towards balance of endocrine system gradually was observed. The correlation of hormonal changes with improvement in symptoms, raises the possibility that moxibustion treatment might work by modulating the hypothalamic-pituitary-gonadal (HPG) axis.

The patient recovered her menstruation as well 10 months later from the amenorrhea, suggesting that moxibustion has a certain pragmatic role in ovarian function and endocrine regulation. In addition to symptom improving and hormonal regulating, we considered moxibustion internationally promoting the physiological functions of perimenopausal women regardless of their symptoms would make it better serve a holistic purpose. To evaluate the modulation effect of moxibustion on the hypothalamic-pituitary-gonadal (HPG) axis, the following formula was constructed to calculate the modulation coefficient of the HPG axis:

$$\text{HPG Coefficient} = \frac{E2_{post}}{FSH_{post} + LH_{post}} \quad (4)$$

Monitoring hormonal changes provides objective evidence for efficacy assessment and offers data support for further research into moxibustion's endocrine regulatory mechanisms. Future large-scale studies should incorporate additional endocrine and neuro-regulatory indicators to systematically

assess moxibustion's long-term effects on perimenopausal hormone levels and overall health status.

4. Mechanism Exploration and Clinical Implications

This case indicates that moxibustion may have beneficial effects in the relief of perimenopausal hot flashes, and improving hormone levels, most likely acting via regulation of the hypothalamic-pituitary-gonadal (HPG) axis. When heat stimulation is administered at qualified acupoints, moxibustion can affect the function of neuro-endocrine, stimulate estrogen secretion and inhibit FSH and LH in inverse. This helps to balance ovarian endocrine function and ameliorates hot flashes and related symptoms. Its thermal effects also benefit blood circulation, adjust autonomic nervous function, and alleviate night sweats, palpations and sleep disturbances, as well as have a positive impact on emotional stability. In order to clearly demonstrate the fluctuation trend of each hormone level over time during the course of treatment, a heat map of the changes in the levels of estradiol (E2), follicle stimulating hormone (FSH), and luteinizing hormone (LH), which were monitored on a weekly basis, is shown in Figure 2:

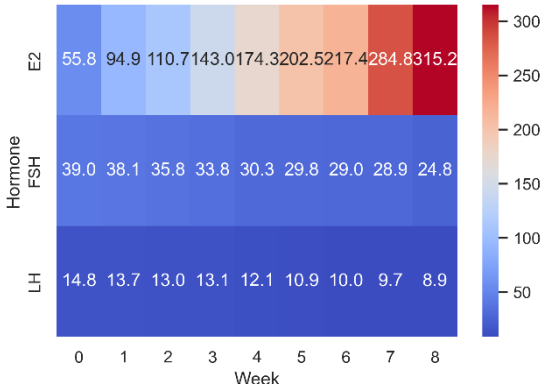

Figure 2 Heat map of hormone level changes with week

Compared to hormone replacement therapy (HRT), moxibustion offers distinct advantages in safety and compliance. While HRT rapidly alleviates hot flashes, long-term use carries risks of breast cancer, endometrial cancer, and cardiovascular disease. In contrast, this case demonstrated no significant adverse reactions during treatment, excellent patient compliance, and straightforward administration—making it suitable for home and outpatient settings. As a non-pharmacological intervention, moxibustion offers a safe and comfortable alternative treatment option for perimenopausal women. In order to comprehensively consider the effects of hot flash symptom improvement and hormone level recovery on patients' quality of life, the following formula was established to calculate the quality of life (QoL) improvement index (where α and β are the weighting coefficients, and E2norm is the reference value of normal estradiol level):

$$\text{QoL Improvement}=\alpha\times\frac{F_{pre}-F_{post}}{F_{pre}}+\beta\times\frac{E2_{post}-E2_{pre}}{E2_{norm}-E2_{pre}} \quad (5)$$

However, this study is a single-case observation with limited sample size, lacking a control group and randomized design. The generalizability of its efficacy and mechanism of action requires further validation. Future research should conduct multicenter, large-sample randomized controlled trials, incorporating symptom assessment, hormone testing, and neuroendocrine indicator monitoring to systematically explore the mechanism of moxibustion in perimenopausal hot flashes, providing more reliable evidence for its clinical application.

5. Conclusion

This case report demonstrates that moxibustion therapy exhibits favorable clinical efficacy for perimenopausal hot flashes, significantly alleviating hot flashes and associated symptoms while improving serum hormone levels and quality of life. Its mechanism of action may involve regulating hypothalamic-pituitary-gonadal axis function. As a safe, convenient, and highly compliant non-

pharmacological intervention, moxibustion offers a novel therapeutic option and perspective for managing perimenopausal hot flashes. Future studies should validate its efficacy in larger-scale, multicenter randomized controlled trials. Concurrently, integrating modern neuroendocrine and immunological research will deepen our understanding of moxibustion's mechanisms of action, thereby advancing its widespread clinical application.

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