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Perimenopause and menopause-Symptoms and treatments

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Abstract. Menopause, which typically begins around 45-50 and lasts 5-10 years, is a physiological phase relevant to every woman and signifies the end of reproductive ability. Extensive research has shown that the occurrence, development, and end of menopause are related to changes in hormone levels in the body. Many women experience a transitional phase called perimenopause before officially entering menopause, in which they mainly experience menstrual irregularity, including disrupted menstrual cycles and changes in menstrual flow. In addition to the emotional and psychological changes similar to those in perimenopause, the main shift in menopause is the cessation of menstruation. Currently, the treatments for menopausal symptoms primarily involve hormone replacement therapy, although long-term use of hormones elevates the chance of getting breast and endometrial cancer. Non-pharmacological approaches such as exercising and maintaining a balanced diet can alleviate mild symptoms. Traditional Chinese medicine, a popular choice for many patients in East Asia, explains all symptoms, such as liver and kidney weakness and Yin-Yang imbalance. Traditional Chinese medicine practitioners customize herbal formulas based on individual symptoms and use acupuncture to alleviate menopausal symptoms. This review summarizes the symptoms and corresponding treatment approaches for perimenopause and menopause, as well as the limitations of current research.

Keywords: Perimenopause, Menopause, Osteoporosis, Hormones, Traditional Chinese Medicine.

1. Introduction

Menopause is marked by the end of menstruation and ovulation, representing the endpoint of a woman's reproductive ability. During the transition from regular ovulation to menopause, there is a premenopausal phase called perimenopause. At birth, women have about one million immature egg cells (oocytes) in their ovaries. By the time they reach puberty, there are approximately 400,000 remaining. From this point, women enter their menstrual cycle, where several egg cells mature each month, but only one is eventually released as an ovum. The rest of the cells either wither or undergo oocyte atresia. By the time menopause is reached, the remaining egg cells are generally less than a thousand, and there are no more follicles in the ovaries. The ovaries become less active, leading to ovarian failure and hormonal imbalances, causing irregular menstrual cycles and entering the perimenopausal phase [1]. During perimenopause, symptoms such as night sweats, hot flashes, difficulty sleeping, rapid heartbeat, and palpitations may occur due to abnormal blood vessel constriction. The International Menopause Society (IMS) defines menopause as when a woman has gone without menstruation for 12 consecutive

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months, with the last menstrual period (FMP) serving as the marker for menopause. The reasons for experiencing perimenopausal and menopausal symptoms mainly stem from the endocrine system, including the neuroendocrine and reproductive systems, with the symptoms varying in severity from person to person [2]. It is worth noting that perimenopause and menopause are a natural part of the aging process, and the focus should be on treating the discomfort they bring rather than the phases themselves.

The menopausal transition typically takes several years (≈4 years). During this period, menstruation changes from regular to irregular, with cycles lengthening or shortening, periods becoming lighter or heavier, and menstruation lasting for shorter or longer durations. These changes mark the beginning of the menopausal transition. Only a few women experience sudden menopause without going through this transition.

The perimenopausal phase is not completely separate from menopause [3]. The transition from the regular menstrual cycle to perimenopause and then to menopause may not have a clear distinction in terms of psychological and emotional changes, so it is important for women over 40 to be concerned about their physical and mental changes. The length of each stage is, to some extent, determined by hormone secretion. Generally, follicles are depleted between the ages of 45 and 55, so the typical range for menopause is between 45 and 55, with earlier onset occurring between 40 and 45 (though rare before 40) and later onset occurring after 55. The age at which menopause occurs is largely influenced by genetics, particularly correlates with the mother's age at menopause [4]. If the mother's age at menopause is either high or low, the likelihood of the daughter experiencing a similar trend is 6 to 12 times higher than the average [5].

2. Perimenopause

In 1994, the World Health Organization introduced a new definition of perimenopause at a conference on “Advances in Menopause Research in the 1990s”: any period of clinical menstrual irregularity that occurs after the age of 40, accompanied by corresponding changes in reproductive hormone levels, until one year after the cessation of menstruation. During perimenopause, women may experience varying degrees of endocrine, physical, and psychological changes. Most women experience menstrual irregularities, while some can achieve a new balance through neuroendocrine self-regulation without noticeable symptoms. However, approximately 85% to 90% of women in perimenopause exhibit a range of symptoms known as a perimenopausal syndrome, primarily characterized by disturbances in the autonomic nervous system caused by hormonal changes, accompanied by neuro-psychological symptoms.

2.1. Irregular Menstruation

The menstrual cycle in women is regulated by hormones that control ovarian follicular development, ovulation, luteinization, luteolysis, and endometrial remodeling. Normal menstruation has a cyclical and self-limiting nature. The interval between the first days of two consecutive menstrual cycles is called a menstrual cycle, typically ranging from 21 to 35 days, with an average of 28 days. The duration of each menstrual period is 2 to 8 days, with an average of 4 to 6 days, and the normal menstrual volume is 20 to 60mL. Reproductive cells in women of childbearing age undergo periodic changes during the menstrual cycle. Menstruation is an essential indicator of reproductive health in fertile women and is a phenomenon that every woman pays close attention to. Menstrual disorders include changes in menstrual cycle and alterations in menstrual volume. For some individuals, the menstrual cycle becomes irregular, no longer following a fixed pattern, with cycles occurring more than seven days early or even twice a month or cycles exceeding 35 days [6]. For others, the menstrual cycle is generally expected, but there is a significant increase in menstrual volume, exceeding 80mL or lasting more than seven days, which can be caused by hormone abnormalities leading to functional uterine bleeding or simple endometrial thickening. There are also cases where the menstrual cycle is generally normal, but the menstrual flow is very low, less than 20ml, or even stops after slight bleeding.

Menstrual disorders during perimenopause can generally be classified into two situations. One is hormonal disturbances caused by endocrine imbalances, which can be regulated with medication. In

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addition, the uterus, cervix, and other areas are prone to problems during perimenopause, so when menstrual disorders occur, organ pathologies should be ruled out as the first step. As ovarian function begins to decline during perimenopause, it is recommended to adjust the menstrual cycle appropriately at this stage, not by supplementing estrogen, which is not low at this point, but by replenishing progestin. Progestin is a type of sex hormone secreted by the ovaries, and its role is to maintain a normal menstrual cycle and support pregnancy.

2.2. Vasomotor Symptoms

Hot flashes are believed to occur due to a natural narrowing of the hypothalamic thermoregulatory system, which controls core body temperature in response to a decrease in estrogen. In most cases, hot flashes start in the face or chest and spread throughout the body, and Some patients may experience noticeable facial flushing. And the duration of a hot flash can last up to 20-30 minutes, with unpredictable frequency. Some women in perimenopause may not experience mild hot flashes, while others may have ones at all. Changes in the temperature can exacerbate hot flashes. Fluctuations in estrogen levels can cause abnormal vascular constriction and dilation, resulting in hot flashes symptoms [7]. On average, hot flashes can persist for 4-5 years and, in some cases, even up to 10 years.

2.3. Mood

Hormonal changes cause symptoms including sleep disturbances, which may manifest as difficulty falling asleep, vivid dreams, and frequent awakenings; Memory decline and cognitive impairment, which could occur in some patients; And autonomic nervous system malfunction, caused by cardiovascular system changes that can result in fluctuations in blood pressure, chest tightness, palpitations, headaches, dizziness, and even hypertension [8-10]. Severe symptoms can even lead to psychological disorders. These can lead to depression, irritability, and increased suspicion.

3. Menopause

During the transition from perimenopause to menopause, hot flashes, night sweats, and psychological changes continue to exist. As estrogen levels further decrease, women may experience breast and genital atrophy, and symptoms related to the urinary and reproductive systems and osteoporosis become more pronounced.

3.1. Genitourinary Symptoms

Perimenopause and menopause are characterized by a decrease in hormone levels. When women enter menopause, estrogen decreases, pelvic tissue ages and relaxes, the strength of the urethral sphincter weakens, and urine flows involuntarily [11]. There are severe patients with uterine prolapse, menopausal women after amenorrhea, uterine body, and uterine atrophy become smaller, the uterus from the normal position along the vagina or out of the vaginal opening. Patients with uterine prolapse usually arrive at abdominal distension and lower back pain, which is especially obvious when active, and in severe cases, will feel lumps coming out of the vagina. Uterine prolapse may occur at all ages, but menopause is the peak of the incidence; avoiding overwork, reducing abdominal pressure, strengthening nutrition, strengthening muscle tone, Kegel training, and pelvic floor muscle repair can effectively alleviate it [12].

3.2. Osteoporosis

Bone loss is generally believed to be determined by bone metabolism and bone structure. In a healthy mature body, fluctuations in total bone mass mostly come from bone remodeling, with the loss and regeneration of bone cells overall maintaining a dynamic balance. When estrogen levels decline, the rate of bone loss increases by 10 times. Estrogen can inhibit osteoclasts, affect the action of active vitamin D, parathyroid hormone, calcitonin, and other hormones, and directly affect osteoblasts, increasing bone mass and maintaining bone formation, absorption, and coupling. Therefore, supplementing estrogen is the first choice.

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The diagnosis of osteoporosis is made when bone mineral density falls below -2.5. Menopausal women experiencing osteoporosis may exhibit various symptoms. Firstly, they may experience generalized body pain due to the decreased density of bone trabeculae. This can lead to systemic pain, particularly in the lumbar spine area, characterized by a dull or achy sensation. Secondly, individuals may feel overall weakness as calcium loss makes the body more prone to fatigue and weakens muscle strength. Lastly, the risk of fractures increases as the reduced density of bone trabeculae and bone hardness make bones more susceptible to external forces, especially common in the chest, waist, back, and hip regions [13]. Fractures in menopausal women take longer to heal due to decreased body function, causing significant disturbance to their daily lives.

4. Treatment

4.1. Hormone Therapy

Hormone therapy has long been the first treatment for improving symptoms during perimenopause and menopause. In the 1990s, the Women's Health Initiative conducted studies on hormone supplementation, using estrogen alone for women with prior hysterectomy and estrogen plus progesterone for women with an intact uterus. However, long-term clinical observations and studies have shown that hormone supplementation can increase the risk of breast and uterine cancer when taken for more than ten years [14]. Finding the balance of hormones that benefit different organs in the body remains an area of exploration.

4.2. Vitamin D

Vitamin D is worth mentioning as a fat-soluble vitamin, also contributes to improving osteoporosis. Adequate vitamin D intake increases the absorption of calcium and phosphorus in the intestines, promotes bone mineralization, improves bone metabolism, and maintains muscle strength. About 90% of vitamin D is synthesized in the skin through exposure to sunlight, with 10% obtained from food. Studies have shown a negative correlation between higher serum 25(OH)D levels and BMI in postmenopausal women, indicating that obese postmenopausal women are more prone to vitamin D deficiency [15]. Vitamin D is crucial in relieving metabolic diseases and significantly enhances the quality of life for women after menopause. Studies have reported that intake of insulin, isoflavones, vitamin D, and calcium positively impact the quality of life, sexual function, body composition, and metabolic rate in menopausal women [16]. Therefore, menopausal women would benefit from exposure to sunlight, as it is a safe and effective way to supplement vitamin D.

4.3. Traditional Chinese Medicine

In the field of traditional Chinese medicine (TCM), although there are no specific terms for “perimenopause” and “menopause,” there are numerous writings on treating related symptoms. TCM practitioners have accumulated valuable experiences based on their own medical cases, which is ubiquitous today. Treatment is individualized based on the person's unique characteristics, and modifications are made to classic formulas. TCM is popular in East Asia, and it considers symptoms as manifestations of underlying imbalances in the body. There are many Chinese herbal medicines available to address different symptoms [17]. Clinical treatments often involve modifying classic formulas based on individual experiences, as the pathology and treatment can vary from person to person, making it challenging. Traditional acupuncture has shown decent efficacy in treating emotional symptoms during perimenopause and menopause [18]. In TCM, menstrual irregularities during perimenopause are classified as early, late, or excessive periods, which are attributed to QI deficiency, excessive yang with internal heat, or blood stasis and liver QI stagnation, and treatment varies depending on the individual. Hot flashes and night sweats are considered symptoms of Yin deficiency and internal heat, and mild symptoms can be managed with dietary therapy, while severe symptoms may require targeted herbal medicine treatments. Emotional issues during perimenopause and menopause are believed to be caused by Yin-Yang imbalance, leading to disturbances in the mind.

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5. Conclusion

When menstrual irregularities occur in women of reproductive age, it is important to take notice, as the perimenopausal period can be considered a precursor to menopause. The symptoms of menopause may appear to a greater or lesser extent during the perimenopausal period, and the duration of this period varies from person to person. Some women may bypass the perimenopausal period altogether and transition directly into menopause. Understanding the symptoms and management strategies for the perimenopausal and menopausal periods can help women overcome psychological barriers, alleviate mental burdens, and proactively face the discomfort of these stages. Early intervention can help moderate symptoms and smoothly navigate through this unique period in life. Research on the perimenopausal and menopausal periods is ongoing, but the symptoms during this period exhibit significant individual variations due to regional, climatic, and lifestyle differences. There is still a lot of research to be done on how to treatments to individual needs, and perhaps in the future, personalized approaches can be achieved through the analysis of big data.

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