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Case Report

Yoga increased serum estrogen levels in postmenopausal women—a case report

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Abstract

Objective: This case report aimed to evaluate 4 months of yoga practice on the quality of life (QOL) and estradiol levels of two postmenopausal women.

Methods: Participants were clinically healthy postmenopausal women, with follicle-stimulating hormone levels greater than or equal to 30 mIU/mL and a body mass index lower than 30 kg/m^2. The participants practiced yoga for 4 months in two 1-hour sessions per week.

Results: The participants exhibited an abnormal estrogen-level increase after 4 months of yoga practice and showed QOL improvements.

Conclusions: In some cases, yoga practice can affect the female neuroendocrine system, increasing estrogen and improving QOL.

Key Words: Estrogen – Menopause – Quality of life – Yoga.

Climacterium is the transition from the reproductive phase of a woman's life to her nonreproductive stage. Changes in the female reproductive system occur before the end of the menstruation period and are marked by neuroendocrine alterations.[1,2] The meaning of menopause may vary according to social and cultural contexts and have positive or negative connotations.[3] With the increase of life expectancy, women are more at risk of symptoms resulting from decreased estrogen levels, which could lead to an alteration in their quality of life (QOL).[4] After the Women's Health Initiative[5] reported that hormone therapy (HT) is correlated with a significant increase of certain diseases, many women discontinued HT[6,7] and are attempting to treat climacteric symptoms with complementary and alternative medicine (CAM).[8] Thus, there is increasing concern among participants seeking treatment that it is efficient and free from negative effects. Lee et al[9] observed that "relieving my discomforts safely" was the primary response of women who had undergone HT and discontinued the treatment. Women who again felt symptoms after interrupting HT sought CAM to relieve discomforts.[10] Yoga may treat menopausal transition symptoms at low cost and with few or no side effects. The number of adults with a medical condition who seek CAM to improve health has been increasing. Bertisch et al[11] concluded that 16.6% of adults in the United States use CAM, such as yoga. Yoga practice has been related to improvements in spinal pain,[12] stress,[13] depression,[14] better levels of functional autonomy, flexibility and QOL,[15] and other benefits. Although some studies report improvements in QOL in postmenopausal women,[16,17] they detect no changes in hormonal levels. This study describes a case report of two postmenopausal women before and after 4 months of yoga practice.

CASE REPORT

This research was approved by the Committee of Ethics in Research of the Universidade Federal de São Paulo (CEP 0408/07), and consent was previously obtained. The women who participated underwent a medical consultation with a gynecologist in the Gynecological Endocrinology Clinic in the Department of Gynecology at the Universidade Federal de São Paulo. They were clinically healthy and had no neurological or psychiatric disorders and no problems with drugs nor with alcohol consumption. Follicle-stimulating hormone levels were greater than or equal to 30 mIU/mL, and their body mass index was lower than 30 kg/m^2. The women did not have any clinical diseases, were not undergoing any HT, nor were they taking food supplements or psychotropic drugs. They were not under psychological treatment. Blood samples

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TABLE 1. *Examination results and quality of life questionnaire*

	Age	BMI	AM	E_2 pre	E_2 post	MENQOLpre	MENQOLpost
Voluntary 1	56	23.8	53	<10	94	136	110
Voluntary 2	58	22.3	50	17	137	106	80

BMI, body mass index (kg/m^2); AM, age at menopause (y); E_2, estradiol (pg/mL); MENQOL, Menopause-Specific Quality of Life Questionnaire.

were taken to measure serum estradiol levels by indirect chemiluminescence; and routine examinations, such as pelvic ultrasound and bilateral mammography, were performed. In addition, the participants answered the questionnaire before treatment and 4 months after beginning the program. They took part in a yoga program administered by a certified instructor. The participants had no prior experience with yoga or meditation. The yoga program consisted of 2 sessions of 1 hour per week for 4 months. The breathing techniques, relaxation, and yoga postures described by Rodrigues[18] were the basis of the sequence utilized. A psychologist who was not involved in the study applied the Menopause-Specific Quality of Life Questionnaire.[19] The Menopause-Specific Quality of Life Questionnaire is analyzed by adding the scores for each item of the questionnaire. The higher the score, the worse the QOL.

RESULTS

The participants exhibited an abnormal increase in estrogen (E_2) levels after 4 months of yoga practice. Moreover, their QOL improved, as shown in Table 1.

DISCUSSION

Increased E_2 levels above those considered normal for postmenopause were observed in the two participants. Yoga and meditation practices have been correlated with certain hormone variations.[20,21] Even though one study reported changes in E_2 levels, it was conducted without scientific rigor.[18] To the best of our knowledge, no previous study, however, investigated the relationships between yoga practices and increased E_2 levels. The alterations observed here were not due to any pathology in the uterus or ovaries, as a gynecologist monitored the participants and they underwent examinations. Their pelvic ultrasound did not indicate any changes.

Women who have undergone HT report improvements in QOL after a relative decline in QOL postmenopause,[22] primarily due to the symptoms resulting from decreased E_2.[23] In addition to the improvements in QOL, a considerable alteration in E_2 levels was observed. Other studies detected improvements in menopausal symptoms or QOL with yoga practice in climacterium or in postmenopausal women.[16,17] On the contrary, these previous studies did not investigate E_2 levels. Higher E_2 levels in postmenopausal women, in addition to relieving climacteric symptoms, may improve QOL. Therefore, this yoga sequence may benefit climacteric and postmenopausal women.

Afonso et al[24] previously suggested that the improvements exhibited by postmenopausal women who participated in a Yoga program were due to alterations in the neuroendocrine, central nervous, and autonomic nervous systems.[25,26] Stress adversely affects the hypothalamic–pituitary–adrenal (HPA) axis and sympathetic and parasympathetic autonomic nervous systems.[27] Both systems communicate with the hypothalamic–pituitary–gonadal (HPG) axis; therefore, the constant presence of stress can cause chronic alterations in the sympathetic nervous system and HPA axis, leading to changes in ovarian function.[28] Previous research has shown that yoga practice decreases cortisol (HPA axis)[20,29] and the sympathetic tone, and increases the parasympathetic tone.[30] Furthermore, certain corporal postures, such as "open and expansive" or "closed and contractive," can alter the levels of certain hormones, such as testosterone and cortisol.[31] During a yoga session, the body adopts many flexion, extension, rotation, and compression body postures, with deep breathing exercise and mental concentration, which can affect the female neuroendocrine system. Chatterjee and Mondal[32] reported a significant increase in basal levels of growth hormone in the blood after 12 weeks of yoga, which may contribute to alterations in the HPA and HPG axis.

CONCLUSIONS

We suggest that the alterations observed in this report are due to yoga practices, reducing stress and improving E_2 levels, thus improving the female reproductive system through the neuroendocrine axis and autonomic nervous system (ANS). The mechanisms underlying these results are, however, not yet completely understood. Therefore, further investigations into hormone-level changes in postmenopausal women completing a yoga practice program and its future implications are necessary.

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