Climacteric Syndrome (40 - 65 Years) and Healthy Aging - Primary Preventive Care for Healthy Female Aging

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Received: April 09, 2025; Published: May 21, 2025

Abstract

On average, women experience menopause around the age of 50. Therefore, with the increase in life expectancy, women may spend approximately 40% of their lives in the postmenopausal period [2]. The present study aims at analyzing the potential contribution Primary Preventive Care (PPC) to healthy aging by screening the four most affected systems during the Climacteric. From May 1, 1999, to December 31, 2016, 2,093 patients were treated at the Climacteric outpatient clinic of the University FMRP-USP). The medical records of the patients were retrospectively analyzed, excluding those with one or more of the conditions that cause early failure, of 305 patients in the climacteric without underlying organic diseases included in this study. Among these patients, one hundred and twenty-seven (41.6%) reported musculoskeletal symptoms and performed lumbar DEXA with a normal result (T score > -1.0). By applying the concepts of New Bone Biology (Protein and Inorganic Matrix), we were able to evaluate the state of the two bone matrices; Iannetta and colleagues [8]. This detailed study opens a broad field of practical applications by enabling the early prevention of chronic noncommunicable diseases during the climacteric. Exacerbated by modern occupations, these age-related diseases hinder healthy aging in women. The world population is undergoing a rapid aging process [1]. Understanding the final stage of life and providing appropriate preventive measures are crucial for promoting healthy aging. For these purposes, physicians should monitor plasma hormone levels and conduct ancillary tests in different organs, in addition to performing genetic testing appropriate for each case, under specific circumstances, before discussing the types, risks, start and duration of HRT. In this study, ruling out organic diseases associated with the four most affected (skeletal, cardiovascular, endocrine and psychiatric) systems during the climacteric, enabled us to determine that the hypothalamic centers (thermoregulatory and sleep-wake centers) give rise to clinical symptoms from the onset of hormonal deregulation. These clinical symptoms specifically originate from the four systems without organic disease This study places gynecologists at the forefront of knowledge, minimizing the sensation of premature aging, which contradicts the conditions of healthy aging, thereby confirming the aphorism that: "We were not born to die from chronic noncommunicable diseases" [12]. Gynecologists play a key role by facilitating the long-desired healthy aging. To this end, they must promptly diagnose patients with the Pure Climacteric Syndrome.

Keywords: Life Expectancy at Birth (LEB); Coronavirus Disease 2019 (COVID-19); Primary Preventive Care (PPC)

Citation: Odilon Iannetta., *et al.* "Climacteric Syndrome (40 - 65 Years) and Healthy Aging - Primary Preventive Care for Healthy Female Aging". *EC Paediatrics* 14.6 (2025): 01-05.

Introduction

In 2023, life expectancy at birth (LEB) reached 73.2 years (70.5 years for men and 75.9 years for women). By 2100, LEB is projected to reach 81.7 years (79.8 and 83.7 years, for men and women, respectively), despite the effects of the coronavirus disease 2019 (COVID-19) pandemic on global mortality rates [1]. On average, women experience menopause around the age of 50. Therefore, with the increase in life expectancy, women may spend approximately 40% of their lives in the postmenopausal period [2].

During this period and in the years leading up to menopause, women commonly present with various signs and symptoms, such as menstrual irregularities, hot flashes and night sweats, sleep and mood disorders, and musculoskeletal, cardiological, endocrinological and psychological symptoms. But the percentage of women working full time has increased since the late 20th century, with women taking on multiple professional roles in their daily lives by leveraging new opportunities in an expanding global market [3]. As women diversified their occupations, venturing into activities historically dominated by men, numerous clinical symptoms increasingly emerged, affecting their lives and hindering our understanding of biological systems from peri- to postmenopause [4]. Primarily affecting women between the ages of 40 and 65, these conditions require physicians to screen for and assess whether symptoms stem from a dysfunction of various organ systems or exclusively derive from hormonal deficiencies, a condition that is known as "climacteric syndrome".

Modern medicine offers countless ancillary procedures, including laboratory and genetic tests to assess the risk for various cancers. However, the hormonal levels of the hypothalamic-pituitary-gonadal axis remain poorly investigated, discussed and applied to promote healthy aging. During the climacteric, a multidisciplinary and patient-centric approach must be applied to examine and determine whether the aforementioned clinical symptoms result from new occupations, which lead to dysfunctions in various organ systems, or specifically represent early signs of hypothalamic dysfunction.

The 4th generation artificial Intelligence (AI) phalangeal quantitative ultrasound (QUS) system was introduced in our hospital in 1996. Since then, this system has been applied during the Climacteric, enabling us to conduct frontier research and to identify the benefits of Primary Preventive Care (PPC). Currently, this approach makes it possible to screen the four most affected systems in the Climacteric from an early age [5-8].

Aim of the Study

The present study aims at analyzing the potential contribution of PPC to healthy aging by screening the four most affected systems during the climacteric.

Methodology

From May 1, 1999, to December 31, 2016, 2,093 patients were treated at the Climacteric outpatient clinic of the Ribeirão Preto Medical School (Faculdade de Medicina de Ribeirão Preto - FMRP), University of São Paulo (Universidade de São Paulo - USP). The medical records of the patients were retrospectively analyzed, excluding those with one or more of the following conditions: premature ovarian failure, ovarian cyst excision, activators of liver 17-beta hydroxysteroid dehydrogenase, childhood mumps, rheumatoid arthritis (treated with corticosteroids), Turner Syndrome (hypogonadism), galactosemia, collagen diseases (Marfan and Ehrles Danlos syndromes), Addison's disease, Down syndrome, mucocutaneous candidiasis, Hashimoto's thyroiditis, hypoparathyroidism, Miastenia Gravis, diabetes mellitus, (pernicious, thalassemia and spherocytic) anemias, liver dysfunctions. In addition, conditions treated with the following surgical procedures were also excluded from the study: tubal ligation, salpingectomy, partial oophorectomy, or hysterectomy. These conditions may directly or indirectly affect hypothalamic function and interfere with ovarian steroid synthesis. Smokers, alcohol users, and consumers of foods and beverages with high xanthine content were also excluded from the study.

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Thus, 305 patients without concomitant organic causes who met the inclusion criteria and had Follicle-Stimulating Hormone (FSH) serum levels between 35 and 124.4 IU/L were included in the study. To assess the state of the bone protein matrix, we applied 4th generation AI QUS propaedeutics to familiarize ourselves with New Bone Biology (Genome Project, 1993-2021) [5,7,9].

Results

Table 1 presents the percentages of clinical symptoms associated with the four systems of 305 patients in the climacteric without underlying organic diseases included in this study. Among these patients, one hundred and twenty-seven (41.6%) reported musculoskeletal symptoms and performed lumbar DEXA with a normal result (T score > -1.0). By applying the concepts of New Bone Biology (Protein and Inorganic Matrix), we were able to evaluate the state of the two bone matrices (Table 2). Comprehensive evaluation of the bone support structure revealed that an elevated body mass index (BMI) worsens the bone protein matrix. In other words, bone quality assessments detect deterioration earlier than conventional dual-wavelength X-ray bone densitometry (X-ray- 2λ), as shown by Iannetta and colleagues [8].

Clinical Symptom	Percentage*
Memory loss	76.10%
Palpitations	61%
Irritability	60.90%
Melancholia	59.60%
Limb paresthesia	55.90%
Anguish	55.90%
Mental fatigue	55.90%
Anxiety	54.90%
Joint pain	53%
Dyspnea	52%
Muscle pain	52%
Varicose veins of the lower extremities	44%
Sweating	41%
Chest pain	38%
Lower-limb edema	33%
Generalized paresthesia	32.40%
Tremor	24.50%
Psychasthenia	19.20%
Cramps	13%

Table 1: Distribution of clinical symptoms associated with the four main systems expressed as percentage of patients (n = 305 patients).

*All patients presented with more than one clinical symptom.

AI Phalangeal QUS Result	BMI between 25 and 30 Kg/m ²	BMI above 30 Kg/m ²
Good bone quality	26.8%	12.9%
Poor bone quality	73.2%	87.1%

Table 2: Results from the qualitative bone assessment of patients with a normal T score on a lumbar spine Dual-Energy X-ray Absorptiom-

etry (DEXA) bone density scan and a high BMI (n= 172 patients) by Artificial Intelligence Phalangeal QUS.

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Discussion

This detailed study opens a broad field of practical applications by enabling the early prevention of chronic noncommunicable diseases during the climacteric. Exacerbated by modern occupations, these age-related diseases hinder healthy aging in women. The world population is undergoing a rapid aging process [1]. Understanding the final stage of life and providing appropriate preventive measures are crucial for promoting healthy aging.

Healthcare professionals commonly treat patients from the onset of the climacteric and analyze hormonal fluctuations through specific evaluations of ovarian function, albeit without assessing hypothalamic hormones levels. Currently, physicians must rule out organic factors associated with symptoms originating from other systems to ensure safe hormone replacement therapy (HRT) during the climacteric. In addition, they must adopt a medical view of the modern woman, with double or triple work shifts and different administrative functions while facing societal pressure to maintain her physical appearance. For these reasons, physicians must monitor and assess the functioning of different organs and systems, the early dysregulation of the hypothalamic system and neuroendocrine changes in women during this period [10].

For these purposes, physicians should monitor plasma hormone levels and conduct ancillary tests in different organs, in addition to performing genetic testing appropriate for each case, under specific circumstances, before discussing the types, risks, start and duration of HRT. In this study, ruling out organic diseases associated with the four most affected (skeletal, cardiovascular, endocrine and psychiatric) systems during the climacteric, enabled us to determine that the hypothalamic centers (thermoregulatory and sleep-wake centers) give rise to clinical symptoms from the onset of hormonal deregulation. These clinical symptoms specifically originate from the four systems. This knowledge enhanced therapeutic safety because the symptoms common to the climacteric manifested in the four systems without organic diseases.

At present, screening for clinical symptoms in the climacteric using the multidisciplinary PPC approach provided by the 4th generation AI QUS Phalangeal System detects the potential involvement of the most affected systems. By applying the concepts of New Bone Biology, this study confirms that the central cause of severe outcomes is the deterioration of the bone protein matrix and bone quality, corroborating previous publications [8,11]. In their daily lives, women now endure the intense stress that men have experienced for centuries. Therefore, physicians must identify women with climacteric syndrome to start early screening and HRT as soon as possible, applying the multidisciplinary PPC approach to provide the desired healthy aging. By doing so, physicians will minimize the numerous clinical symptoms that torment many women, exacerbating numerous problems in their daily lives.

This study places gynecologists at the forefront of knowledge, minimizing the sensation of premature aging, which contradicts the conditions of healthy aging, thereby confirming the aphorism that: "We were not born to die from chronic noncommunicable diseases" [12]. Gynecologists play a key role by facilitating the long-desired healthy aging. To this end, they must promptly diagnose patients with the Climacteric Syndrome.

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