Hypertension in Climacteric: Prevalence and Intensity of Symptoms

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Abstract

Introduction: Menopause is a phase in the female life cycle marked by the end of menstruation, which some women experience in a healthy way, while others experience symptoms that vary in their diversity and intensity. One pathology that is evident in climacteric is systemic arterial hypertension (SAH), mainly during the postmenopausal phase. SAH is characterized by high blood pressure levels, which can trigger diseases.

Objective: To determine the prevalence of SAH and the intensity of symptoms in menopausal women in a city of Northeastern Brazil.

Method: This is a quantitative, cross-sectional study. Using a sample of 396 women between 40 and 60 years old, the study was performed at all family health units in the municipality of Cajazeiras-PB. The data were collected through structured interviews and were analyzed using the SPSS Statistics software package.

Results: The average age of the women interviewed was 50 (±5.801). They had, on average, 7 (±4.733) years of study and per capita incomes of 0.5 (±0.6958) times the minimum wage. A total of 69.9% (n = 277) had a fixed companion, and 51.8% (n = 205) were white. The prevalence of SAH was 35.1%. SAH was associated with age [OR: 2.164 (95% CI 1.417-3.306)], activity in the home [OR: 1.686 (95% CI 1.103-2.576)], overweight/obesity [OR: 2.748 (95% CI 1.738-4.343)], menopause/post-menopause [OR: 2.180 (95% CI 1.432-3.321)] and heightened symptomatology [OR: 3.143 (95% CI 1.608-6.146)]. The menopausal symptoms that were more prevalent in hypertensive subjects were arthralgia (84.9%), nervousness (84.2%) and fatigue (81.3%).

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Conclusion: Women in climacteric deserve special attention from health professionals, especially if this phase is associated with any pathology, such as hypertension. It is important for health professionals to develop strategies for early diagnosis, prevention and health promotion for women in the climacteric phase.

Introduction

Brazil is undergoing a significant aging process, and given these current demographic changes, the feminization of old age is increasing. This female overrepresentation is the result of the longer life expectancies of women.

According to the 2010 census of 190,755,199 Brazilians, 51% of the population was female. Older people number 20,590,599, representing 10.8% of the total population of which 55.5% (11,434,487) is female[1].

The increase in life expectancy of the female population is reflected in a growing number of menopausal women, and data from the Department of the Unified Health System (DATASUS) show that of the 98 million Brazilian women, 30 million are between 35 and 65 years old, which is the age range in which menopause occurs, according to the Ministry of Health, Brazil[2].

Menopause is a stage of the female life cycle during which the transition from the reproductive to the non-reproductive period occurs. This process is physiological, characterized by ovarian failure, and marked by the end of menstruation. Some women experience this change in a healthy way, while others experience symptoms that vary in intensity and diversity, such as fatigue, anxiety, insomnia, hot flashes, and others that can trigger diseases linked to bone and lipid metabolism.

The International Menopause Society divides climacteric into three phases: premenopause, which usually begins after age 40, with reduced fertility and either irregular or regular menstrual cycles, compared to what occurred in their reproductive period; perimenopause, which begins two years before the last menstrual period and extends for a year after and is usually marked by irregular cycles and endocrine disorders; and postmenopause, which begins one year after the last menstrual period and is subdivided into early (five years after menopause) or late (more than five years after the last menstrual period) [3].

One of the prevalent diseases in menopause is high blood pressure (hypertension). Menopause has been identified as a contributing factor in the development of hypertension in women due to subsequent hormonal deficiency, which can cause alterations in vasoactivity (vasospasm), resulting in increased vascular tone and, hence, increased blood pressure (BP) and decreased tissue blood flow[4].

Poor eating and lifestyle habits are primarily responsible for the increase in the number of women with hypertension because it is a condition linked to environmental, behavioral and dietary factors.

Considering the increase in life expectancy for women and various complaints that they have during menopause, when they experience high blood pressure, there is an overlap of events (symptoms of menopause and high BP). Therefore, monitoring

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and guidelines are required to maintain quality of life and prevent health problems.

This study is relevant, because there is a need for further research in this area, especially at the local level, considering women's workloads and overlapping events. Thus, the intention to conduct this research was anchored on the assumption that, in contemporary times, women perform a number of activities that can contribute to the onset of hypertension in adulthood as well as increased climacteric symptoms, especially if they do not have healthy lifestyles that include physical activity.

Thus, this research aims to determine both the prevalence of hypertension in women and the level of climacteric symptoms in hypertensive women in the city of Cajazeiras, Paraiba.

Method

This is a quantitative, cross-sectional study performed at 14 family health units (USF) in the urban areas of the city of Cajazeiras, PB from January 2013 to March 2014. This municipality is located in the hinterland 476 km from the capital, and according to the last census conducted by the Brazilian Institute of Geography and Statistics,[5] it has a land area of 566 km² and 58,443 inhabitants.

The sample of this research was calculated probabilistically based on a sample calculation of a finite population, adopting a significance level of 5%, a sampling error of 5% and a 95% confidence interval based on a population of 9996 women aged 35 to 65 years[5]. The calculated sample to be investigated was 385 women. However, 543 interviews were conducted. The included participants were women aged 40-60 years. This range was used because before age 40, climacteric symptoms are virtually absent, and after age 60, women rarely have climacteric complaints due to physiological adaptation. The following exclusion criteria were applied: women whose climacteric complaints were absent,

women who had undergone hysterectomy and women who used hormone replacement therapy (HRT) and/or hormonal contraceptives because they interfere with climacteric symptoms. After exclusion, the final sample included 396 women.

The data collection was performed through structured interviews, taking advantage of women's visits to the 14 USF locations for Pap smears, Hypertension and Diabetes (HIPERDIA) Program consultations and home visits, with community health workers.

The intensity of climacteric symptoms was assessed quantitatively by Blatt-Kupperman Menopausal Index (BKMI). Eleven symptoms are considered in this index: hot flashes, paresthesia, insomnia, nervousness, depression, dizziness, fatigue, arthralgia/myalgia, headaches, palpitations and tingling.

To determine the BKMI, the various symptoms are scored according to their intensity, being cataloged as mild, moderate or severe. Vasomotor symptoms were scored according to the intensity of received values as 4, 8 and 12; paresthesia, insomnia and nervousness were scored as 2, 4 and 6; and depression, dizziness, weakness, arthralgia/myalgia, headache, palpitations and tingling were scored as 1, 2 and 3. These values were summed, and the index categories were divided as follows: mild, up to 19 points; moderate, 20 to 35 points; and severe, greater than 35 points[6].

The data collection instruments were listed sequentially. The variables analyzed consisted of *demographic data*: age, education, per capita income, color, marital status and occupation; lifestyle factors: physical activity, meals/day, smoking and BMI; and the *presence of hypertension*, which was confirmed by registering with the HIPERDIA program and the use of hypotensive treatment.

Descriptive statistics, that is, the mean and standard deviation of the age, education and income per capita variables, were based on the 396 women interviewed. However, the prevalence of climacteric symptoms was described based on the 139 women with hypertension. To determine the prevalence and

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association of hypertension and correlated variables, we used odds ratios with 95% confidence intervals. This association was confirmed using a linear regression model. Excel and the SPSS Statistics software package version 22 (free to download) were used for the analysis and tabulation of the data.

This research is part of the project "Symptoms of menopause: severity and associated factors," which was approved by the Research Ethics Committee of the State University of Paraíba - UEPB as protocol number 0462.0.133.000- 11, on 14th September, 2011.

The ethical aspects were considered in this study. This research followed the recommendation of Resolutions 196/96 and 466/2012 of the National Health Council, which governs research with human subjects. The subjects involved are guaranteed clarification of any desired aspect as well as the freedom to refuse to participate in the study, withdraw consent or discontinue participation at any time. Participation in the study was voluntary, and confidentiality of the information and anonymity were guaranteed. Women were included in the sample after they had read, understood and signed two copies of a Free and Clear Informed Consent (FCIC) form, one for the woman and one for the researcher responsible for the interview.

Results

Sociodemographic Features of the Women Interviewed

The women interviewed were on average 50 (±5.801) years of age, had 7 (±4.733) years of education and a per capita income 0.5 (± 0.6958) times the minimum wage (MW); 69.9% (n = 277) had a fixed partner and 51.8% (n = 205) were white (Table 1).

The prevalence of hypertension was 35.1% (n = 139) of which 63.3% (n = 88) of the women complained of hypertension, 20.9% (n = 29) reported hypertension associated with type I or II diabetes, and 15.8% (n = 22) reported hypertension associated with other diseases, including cancer, osteoporosis or hormonal disorders of the thyroid (**Table 1**).

Table 1. Sociodemographic characteristics and prevalence of SAH in 396 climacteric women resident in the municipality of Cajazeiras, Paraiba, Brazil, 2013-2014.

Characteristics	Total	Results
Age[*]	396	50 (±5.801)
Schooling[*]	396	7 (±4.733)
Per capita income[*]	396	0.5 (±0.6958)
Marital status	396	69.9% (n = 277)
Skin color (self-reported)	396	51.8% (n = 205)
Presence of SAH	396	35.1% (n = 139)
Only SAH	139	63.3% (n = 88)
SAH and diabetes type I or II	139	20.9% (n = 29)
SAH and other diseases	139	15.8% (n = 22)

*Average (standard deviation)
Source: Research data.

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Table 2. The relationship between SAH and socio-demographic variables (n=396). Cajazeiras, Paraíba, Brazil, 2013-2014.

Categories	SAH (n=139) Prevalence ratio 95% CI
Age 51 to 60	2.164 (1.417-3.306)
0 to 7 years of education	1.434 (0.947-2.173)
Activity at home	1.686 (1.103-2.576)
Non-remunerated occupation	1.460 (0.964-2.211)

Source: Research data.

Table 3. The relationship SAH with lifestyle-related variables and menopausal stage (n=396). Cajazeiras-PB, Paraiba, Brazil, 2013-2014.

Categories	SAH (n=139) Prevalence ratio 95% CI
Overweight/obesity	2.748 (1.738-4.343)
Smoking	0.885 (0.529-1.482)
Postmenopause	2.180 (1.432-3.321)
High BKMI score	3.143 (1.608-6.146)

Source: Research data.

SAH *versus* Sociodemographic Variables, Lifestyle, Menopausal Status, and BKMI

When analyzing the participant data, as shown in **Table 2**, the presence of hypertension was significantly associated with age, exercise and professional activities in the home. There was no association between hypertension and schooling or unpaid occupation.

The data shown in **Table 3** show the relationship between the presence of hypertension and variables related to lifestyle and menopausal stage. Hypertension was significantly associated with overweight/obesity, postmenopause and a BKMI score indicating severe symptoms. No association was found between hypertension and smoking.

Table 4 shows the most prevalent symptoms in the study, other than hypertension: arthralgia (84.9%), nervousness (84.2%) and fatigue (81.3%). However, there significant percentages of other symptoms were reported.

Discussions

The average age of the interviewed women (**Table 1**) was equivalent to a previous investigation of 260 women, which reported an average age of

50 years old and living in a stable union. However, the average years of study in that survey exceeded eight years, and per capita income was near the minimum wage[7]. With regard to education, Leite

Table 4. Prevalence of menopausal symptoms in hypertensive women (n=139). Cajazeiras-PB, 2013-2014.

Symptoms	% (n)
Arthralgia	84.9 (118)
Nervousness	84.2 (117)
Tiredness	81.3 (113)
Sadness/melancholy	79.1 (110)
Hot flushes	77.7 (108)
Paresthesia	76.3 (106)
Sleep problems	74.1 (103)
Vertigo	71.9 (100)
Palpitation	69.8 (97)
Headache	69.1 (96)
Analgesia of members	69.1 (96)

Source: Research data.

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et al.[8] found that the majority of menopausal women completed elementary school (55%), which is less than eight years of study.

In this regard, research including hypertensive women in the climacteric period has found a higher prevalence of married women who have not completed primary education and a family income between 1 and 1.5 times the minimum wage. However, most were mixed with an age range of 60 to 65 years old[9].

In general, the data in this study (Table 1) show socioeconomic and educational precariousness. Analyzing the sociodemographic profile of the menopausal women is an important tool to detect the relationship between hypertension and menopause because the number of hypertensive women increases with advancing age, which coincides with the climacteric period.

The low level of education observed in this study (Table 1) allows one to consider a direct relationship with low socioeconomic status. Several studies have examined the association between hypertension and economic situation, which in turn is associated with other risk factors for hypertension[10].

The percentage of hypertensive women increased with age, revealing a direct relationship between hypertension and aging. This study takes place in Brazil, where hypertension is more prevalent in women, especially among those older than 65 [11].

With regard to education, no relationship was observed with hypertension (Table 2). However, education is paramount in the adoption of health promotion and disease prevention practices. Jesus and Neves [12] claim that the level of education does not determine the appearance of a pathology; however, a person with a higher level of knowledge can more easily pursue disease prevention strategies and perform self-care, and education is central to better understanding of and adherence to a treatment.

It is not just exercise activities outside the home that reduce the hypertension rates among women. Professional qualifications are associated with more education and therefore with increased adoption of healthy lifestyles. Research has proven the importance of women entering the labor market in many ways, noting that paid work has proved to be a protective factor against anxiety and depression in menopausal women who have approximately five times lower risk of developing the pathologies studied[13].

In turn, income may allow better or faster access to health services and adherence to private health plans, enabling early diagnosis of disease and the use of preventive measures[14].

The findings draw attention to comorbidities associated with hypertension (Table 1). Women have a significant increase in cardiovascular risk between the ages of 50 and 64. This change in cardiovascular risk profile coincides with climacteric changes and is characterized by the emergence or worsening of some risk factors: central obesity, hypertension and dyslipidemia[15].

Regarding the association of hypertension with other diseases, research conducted in 2012[16] showed that in both sexes, the prevalence of diabetes associated with hypertension increases with age, and the highest prevalence is observed in women.

Corroborating the results of this study (Table 1), research conducted in Brazil found that the prevalence of comorbid conditions was higher in the postmenopausal group, and of these co-morbidities, hypertension, diabetes mellitus, disease rheumatic, neoplasms and stroke were emphasized[17].

Previous research was conducted and found similar results in a sample of 323 postmenopausal women; the majority (64.4%) had confirmed previous clinical comorbidities: a history of cancer, hypertension, diabetes and acute myocardial infarction[18].

Climacteric women are more likely to develop cardiovascular disease due to a gradual decrease of hormones. Coronary artery disease is two to three times more common after menopause, and this can be associated with the accumulation of visceral fat, which increases during menopause[19].

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Several population studies have shown that obesity is a major risk factor for hypertension[20] whose prevalence doubles in young adults (20-39 years old) and is at least 50% higher in older adults (40-49 years old) who are overweight compared to normal weight subjects[21].

In a study of 408 individuals of both sexes, hypertension prevailed among women, with obesity as one of the main risk factors, and those aged 50-59 years old were more likely to suffer from hypertension[22].

Smoking is a risk factor for high blood pressure. However, in this study, it was not associated with the presence of hypertension (Table 2). One of the causes of early menopause is smoking due to the estrogen deficiency caused by tobacco use, resulting in not only anticipating the onset of the symptoms of menopause but also in conditions, such as osteoporosis and cardiovascular disease[8].

Regarding the association between hypertension and menopause (Table 3), premenopausal women have lower blood pressure than men of the same age. However, as they grow older, women have higher rates of hypertension than men, suggesting that female hormones play an important role in hypertension. However, determining that role in the pathogenesis of hypertension is complex due to the effects of aging on the cardiovascular system and its relationship with other risk factors, such as body weight and cholesterol levels[23].

According to the above author, endothelial dysfunction, and reduced vascular tone modulator vasodilators are associated with disease, including hypertension and atherosclerosis; this may be the mechanism by which estrogen deficiency can cause hypertension.

The significant association of hypertension with the menopausal/postmenopausal period found in this study (Table 3) is supported by Santos, Silva and Monteiro[24], who found a high prevalence of hypertension in the women interviewed; these respondents were 50 years old, on average, and in 40% of them, hypertension was associated with menopause.

In justifying the association between hypertension and severe climacteric symptoms (Table 3), we would emphasize ovarian failure and the decline of hormones during the menopausal and postmenopausal stages and its relationship with cardiovascular disease.

Research analyzing the influence of sex hormones in modulating endothelial function has shown that estrogen plays an important role in the regulation of endothelium. In hypertensive women, entering menopause has been associated with the development or exacerbation of endothelial dysfunction. The renin-angiotensin system (RAS) is also influenced by female sex hormones. This system is important in the regulation of vascular tone and growth[4].

Thus, that hypertension was more prevalent in women with pronounced climacteric symptoms may be related to this phenomenon because the negative influence of this hormone decline is linked to vasomotor, psychological and urogenital symptoms, increasing tone and causing high blood pressure.

Climacteric symptoms are self-reported complaints; most are subjective in nature and therefore difficult to measure. They can often be overestimated or exacerbated by the participant at the time of collection, which is one of the limitations of the research. The women were also evaluated at a single time point.

Corroborating the results in Table 4, in research aimed at identifying information on menopause, its signs and symptoms and self-care measurements, it was identified that all respondents had more than one symptom/sign among those listed in the interview guide, with the most prevalent symptom being arthralgia/myalgia (74%)[25].

Research that aimed to identify factors that are predictors of climacteric symptoms found that the most prevalent symptoms were irritability (87.1%), arthralgia/myalgia (77.5%) and melancholy/sadness (73.2%)[26].

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In the present study (Table 4), arthralgia, nervousness and fatigue were the most frequent climacteric symptoms, whereas hot flushes, identified in several national and international studies as major symptoms, were not among the symptoms most cited by women.

Overall, these findings constitute important implications for health services, stressing that these women require adequate and special attention. The frequency and intensity of hot flashes and other prevalent symptoms in menopause that compromise women's quality of life require special attention [27].

Menopause is experienced in different ways by different women; there are variations in symptoms and in physical, demographic, socioeconomic and cultural aspects, which result in peculiar perceptions and experiences of this phase among women worldwide.

In Brazil, considering the continental dimensions and regional characteristics, it is not expected that the climacteric experience is similar among women from different regions and even those of a common region. These differences become even more emphatic when considering that a significant part of the population lives in suburban and rural areas, where low education, low family income and high morbidity and mortality resulting from diseases linked to poor socioeconomic conditions are prevalent[28].

It is essential, however, that menopausal women have access to health information so that they understand how changes occur during this period and so that they are able to understand the signs and symptoms that are present or may be present because women often attribute menopause symptoms to medical comorbidities or previous emotional difficulties, distorting their perception of this phase of their lives[25].

Conclusions

The changes caused by menopause have an impact on various aspects of life, including interpersonal relationships, roles as professional-woman-mother-wife, and discomfort caused by body changes, body image and relationship with aging. The overlap of these factors and hypertension leads to a sharp increase of climacteric symptoms compared to women who do not have hypertension.

Although there are limitations of this research because it was conducted at a single moment, without intervention, without following the study population, failing to have specific laboratory tests conducted, and self-reporting symptoms, the results raise hypotheses about hypertension that deserve further investigation. Due to the complexity of the issue in question, much remains to be investigated.

Concerning the health of the climacteric women, the encouragement of research is essential to facilitate the understanding of what happens during this phase, contributing to a better understanding and improving the quality of life of these women. Finally, it is important for health professionals to develop strategies for early diagnosis, prevention of hypertension and health promotion for women in the climacteric phase.

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