Original Article

Evaluation of Cardiovascular Risk in Climacteric Women: A Cross-Sectional Study

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Abstract

Purpose: To identify cardiovascular risk factors in women between 40 and 65 years old in two private clinic of gynecology in Minas Gerais. **Methods:** Cross-sectional study from January/2016 to January/2017 in 137 climacteric women. A standardized questionnaire was used to evaluate socio-demographic characteristics, climacteric phases, cardiovascular risk factors, menopause (age, time and type), number of pregnancies, normal births, abortions, partners and hormonal therapy. The evaluation model was used according to the Framingham risk score. **Results:** The median age was 47 years, and 35% were postmenopausal. The majority were married and 42.3% caucasian. Abdominal circumference greater than 80 cm was observed in 87.6%, and greater than 88 cm in 67.2%. High total cholesterol (TC) was observed in 48.2%. Low levels of high-density lipoprotein (HDL-c) were observed in 42.3%. Elevated levels were observed for low density lipoprotein (LDL-c) in 39.4%, triglycerides in 29.9%, and fasting glucose in 8.8%. Also, systolic and diastolic blood pressure were considered high in 25.5% cases. Postmenopausal women presented higher values of TC and HDL-c. Analysis of the Framingham risk score revealed a higher cardiovascular risk for postmenopausal women. Higher values of waist circumference, glycemia and triglycerides were observed for women with higher cardiovascular risk. **Conclusions:** Postmenopausal women had a higher risk of cardiovascular events when compared to premenopausal ones.

Keywords: *Climacteric, coronary artery disease, hyperlipidemia, risk factors*

Introduction

The climacteric and menopause are defined as a biological phase which comprises the transition between reproductive and nonreproductive periods. Menopause is the last menstrual cycle, recognized after 12 months of its occurrence.[1]

The association between the loss of ovarian function and the increase of coronary risk is well established. Women develop cardiovascular diseases (CVDs) approximately 10 years later than men.[1] In the age range of 45–64 years, 10% of women have some form of CVD, while after 65 years, this proportion is 25%.[2]

The risk factors for CVD may be nonmodifiable (age, sex, and family history) and modifiable (sedentary lifestyle, smoking, hypertension, diabetes mellitus [DM], total cholesterol [TC], lipoprotein [Lp]) of high- and low-intensity [high-density Lp-cholesterol (HDL-c)/low-density Lp-cholesterol (LDL-c)]), triglycerides (TG), (Lp [a]), and metabolic disorders (obesity, especially abdominal, dyslipidemia, and metabolic syndrome [MS]).[3]

To estimate cardiovascular risk, the ideal would be to determine the total risk, which must be the parameter for the clinical and therapeutic-preventive decision.[4] Prediction scores were clinically developed to identify overall cardiovascular risk, as the

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Framingham risk score (FRS). The pharmacological and nonpharmacological conducts can be based on the risk factors present in the score.[5]

The objective of this study is to compare the cardiovascular risk, per menopause phase (pre- or post-menopausal) in women from 40 to 65 years, in private practice of gynecology in Minas Gerais State, Brazil.

Methods

A cross-sectional study was carried out in menopausal women, 40–65 years, from January 16th to January 17th in two private practices in Minas Gerais state, Brazil.

For the menopause phases, it was considered the menstrual pattern in the last year and the value of follicle-stimulation hormone (FSH) in women without uterus, being in premenopausal with menstrual cycles in the last year, and postmenopausal, when confirmed spontaneous amenorrhea for 12 months or more. In hysterectomized patients, it was considered the ones in menopause with FSH above 40 IU/ml.[6]

The sample size was calculated using a study as reference.[7] At 5% level of significance, minimum power of 80%, adopting as reference value of the prevalence of 56%, and a maximum error of 10%, 137 women were necessary.

The participants were invited to respond to a standardized questionnaire to assess the sociodemographic characteristics; menopause stages, cardiovascular risk factors: Blood pressure (BP), DM, body mass index (BMI), waist circumference (WC), smoking, alcohol, physical activity, diet, family history and history of CVD, and use of hormone therapy (HT). They were also requested laboratorial examinations (computed tomography [CT], HDL-c, LDL-c, TG, and glycemia).

For the BMI calculation, it was used the weight in kilograms divided by height in meters squared (kg/m²). The BMI cut-off points adopted were normal (18.5–24.9 kg/m²), overweight (25.0–29.9 kg/m²), and obesity ≥30.0 kg/m².[8] WC was measured in centimeters with flexible and stretchable tape measure without compressing the tissues. It was measured on an imaginary horizontal line that passed the mid-point between the lower edge of the last rib and the iliac crest.[9] The cut-off points adopted were those recommended in accordance with the degree of risk for CVD in women: increased risk (WC >80 cm) and very increased risk (WC >88 cm).[10]

The following were defined as risk factors for CVD: values of TG ≥150 mg/dl, glycemia ≥110 mg/dl, levels of TC ≥200 mg/dl, LDL-c ≥130 mg/dl and HDL-c <50 mg/dl, and systolic BP (SBP) ≥130 mmHg and diastolic BP (DBP) ≥85 mmHg.[11] The presence of MS was defined according to the criteria of NCEP-ATPIII,[12] which requires the presence of three or more than five factors (a) CA: >88 cm; (b) TG ≥150 mg/dl; (c) HDL-c <50 mg/dl; (d) SBP ≥130 mmHg or DBP ≥85 mmHg; and (e) fasting glucose ≥110 mg/dl.

To assess the cardiovascular risk, the model of cardiovascular risk assessment of Framingham was used, called the FRS, which is used to estimate the absolute risk for the development of ischemic coronary disease or death as a result in 10 years, which includes in its calculation, data regarding age, gender, serum values of TC and HDL-c, BP, and smoking. It is defined as a high cardiovascular risk scores >20%, intermediate cardiovascular risk (10–20%), and low (<10%).[13]

This study was approved by the Research Ethics Committee of the Faculty of Medical Sciences – MG with CAEE no. 48757015.6.0000.5134 and opinion no. 1.281.400.

This article was prepared on the basis of recommendations strengthening the reporting of observational studies in epidemiology[14] for cross-sectional observational studies.

Statistical analysis

The categorical variables were presented as counts and percentages, and the numeric variables were as mean ± standard deviation (normality was assessed through Shapiro–Wilk test) or median ± interquartile range (IQR, in case of nonnormal distribution). For comparison of numerical variables among groups, the Wilcoxon Mann–Whitney U-test and *t*-test for independent samples were used. The association among categorical variables was evaluated through Fisher's exact test or Chi-square test of independence. Spearman's correlation was performed to verify the relationship between cardiovascular risk factors and WC. The analysis was performed using the software R version 3.3.2, supported by the R Core Team. Vienna, Austria. It was considered significance level of 5%.

Results

The sample was composed of 137 women, postmenopausal (35%). The median age was 47 ± 10 years; 81.6% were married/lived with a partner and white race (42.3%). Of these, 35.8% had 12 or more years of study and personal income between one to two minimum wages (33%) [Table 1]. Postmenopausal women were older ($P < 0.001$) and there was a smaller proportion of married/with a partner women ($P = 0.049$) [Table 1].

Table 1: Sociodemographic characteristics of women from 40 to 65 years, in the pre- and post-menopausal, in private clinic of gynecology in Betim/MG and Igarape/MG

Variables	All sample (*n*=137), *n* (%)	Premenopause (*n*=89), *n* (%)	Postmenopause (*n*=48), *n* (%)	*P*
Age	47±10	44±5	55.5±7	<0.001[W]
Marital status*				
Single/widow	15 (11)	6 (6.8)	9 (18.8)	0.049[Q]
Married/with companionship	111 (81.6)	77 (87.5)	34 (70.8)	
Divorced/separated/legally separated	10 (7.4)	5 (5.7)	5 (10.4)	
Race				
Nonwhite	79 (57.7)	53 (59.6)	26 (54.2)	0.669[Q]
White	58 (42.3)	36 (40.4)	22 (45.8)	
Education (years of study)				
Until 4 years	35 (25.5)	23 (25.8)	12 (25)	0.389[Q]
Between 5 and 8 years	20 (14.6)	13 (14.6)	7 (14.6)	
Between 9 and 11 years	33 (24.1)	25 (28.1)	8 (16.7)	
12 years or more	49 (35.8)	28 (31.5)	21 (43.8)	
Income*				
Up to 1 minimum wage (SM)	34 (31.2)	21 (29.6)	13 (34.2)	0.259[Q]
Between 1 and 2.5 SM	36 (33)	28 (39.4)	8 (21.1)	
Between 2 and 3.5 M	14 (12.8)	8 (11.3)	6 (15.8)	
>3.5 M	25 (22.9)	14 (19.7)	11 (28.9)	

*Variables have missings. *P* values refer to the tests: [W]Wilcoxon Mann-Whitney for independent samples and, [Q]Chi-square of independence, Age was presented as median±ID. DI: Interquartile distance

Table 2: Cardiovascular risk factors in women from 40 to 65 years, in the pre- and post-menopausal, in private clinic of gynecology in Betim/MG and igarape/MG

Variables	All sample (*n*=137), *n* (%)	Pre-menopause (*n*=89), *n* (%)	Postmenopause (*n*=48), *n* (%)	*P*
BMI (kg/m^2)	26±6	27±7	25.1±4.4	0.281[W]
Abdominal circumference (cm)	93.8±11.5	94.2±11.8	92.9±11	0.533[T]
Blood pressure (mmHg)				
Systolic	120±20	120±15	120±15	0.092[W]
Diastolic	75±15	75±10	77.5±15	0.386[W]
Laboratory measures				
Total cholesterol (mg/dl)	198±50	190±45	211±55.8	0.005[W]
HDL (mg/dl)	52±19	48±19	55.5±19.8	0.005[W]
LDL (mg/dl)	122±51	118±46	126±50	0.141[W]
Triglycerides (mg/dl)	114±73	102±72	126.5±85.8	0.090[W]
Fasting glucose (mg/dl)	86±15	85±12	86.6±16.4	0.554[W]
Diabetes mellitus	11 (8)	7 (7.9)	4 (8.3)	1.000[F]
Life habits				
Current smoker/former smoker	36 (26.3)	18 (20.2)	18 (38.3)	0.051[Q]
Current drinker	38 (27.7)	21 (23.6)	17 (35.4)	0.203[Q]
Physical activities	49 (35.8)	28 (31.5)	21 (43.8)	0.213[Q]
Family history of CVD	113 (82.5)	73 (82)	40 (83.3)	1.000[Q]
Mother/father	100 (73)	63 (70.8)	37 (77.1)	0.555[Q]
Uncle/aunt/grandparents	47 (34.3)	31 (34.8)	16 (33.3)	1.000[Q]
Previous family history of CVD	33 (24.3)	21 (23.6)	12 (25.5)	0.968[Q]

*Variables have missings. *P* values refer to the tests: [W]Wilcoxon Mann-Whitney (data presented as median±ID) and *t*-Student (data presented as mean±SD) for independent samples, [Q]Chi-square of independence and [F]Fisher's exact. BMI: Body mass index, CVD: Cardiovascular disease, SD: Standard deviation, HDL: High-density lipoprotein, LDL: Low-density lipoproteins, DI: Interquartile distance

The average age at menopause was 48.6 ± 4.2 years, and the average time of menopause was 7.9 ± 5.4 years. The TH was used by only 10.2% (27.1% in postmenopausal women). The majority of women (89.1%) had some pregnancy, 63% had a normal delivery, and 31.2% had an abortion.

With respect to the cardiovascular risk factors, the values observed for the median BMI was 26 ± 6 kg/m^2, WC

average (93.8 ± 11.5 cm), SBP (120 ± 20 mmHg) and DBP median (75 ± 15 mmHg) and median values in mg/dl for TC (198 ± 50), HDL-c (52 ± 19), LDL-c (122 ± 51), TG (114 ± 73), and glycemia (86 ± 15). Only 8% of women were diabetic, smokers or former smokers (26.3%), alcohol consumption (27.7%), and practiced physical activity (35.8%). The majority 82.5% had a family history of CVD (father and/or mother in 73% of the sample), and the history of CVD was reported by 24.3%. Postmenopausal women showed higher values of TC and HDL-c (P = 0.005 in both cases) [Table 2].

Only 6.6% were current smokers, while 19.7% were former smokers. It was observed WC>80 cm in 87.6% and >88 cm in 67.2% of the women. The CT of at least 200 mg/dl was observed in 48.2%, being higher among those in postmenopausal (P = 0.022), and HDL-c <50 mg/dl was observed in 42.3%, being smaller between the postmenopausal (P = 0.005) and LDL-c to at least 130 mg/dl (39.4%). It was observed TG of at least 150 mg/dl in 29.9%, SBP ≥130 mmHg in 25.5%, DBP ≥85 mmHg in 25.5%, glycemia ≥110 mg/dl in 8.8% and MS in 35% of the women [Table 3].

On analyzing the FRS, 9.5% of women presented intermediate/high risk for CVD, this percentage is equal to 6.7% (premenopausal) and 14.6% (postmenopausal) women (P = 0.219). The median value of cardiovascular risk in 10 years was 3.9 ± 3.9, being greater in postmenopausal (P < 0.001) [Table 4].

In the comparison of risk factors for CVD in the categories of the FRS, it was observed higher values for women with intermediate/high risk (P = 0.044), glycemia (0.033), and TG (P = 0.007). All women

Table 3: Cardiovascular risk factors in women from 40 to 65 years, in the pre- and post-menopausal, in private clinic of gynecology in Betim/MG and igarape/MG

Variables	All sample (n=137), n (%)	Premenopause (n=89), n (%)	Postmenopause (n=48), n (%)	P
Abdominal circumference (cm)				
>80	120 (87.6)	78 (87.6)	42 (87.5)	1.000[Q]
>88	92 (67.2)	60 (67.4)	32 (66.7)	1.000[Q]
Tabagism				
Current smoker	9 (6.6)	4 (4.5)	5 (10.4)	0.277[F]
Former smoker	27 (19.7)	14 (15.7)	13 (27.1)	0.121[F]
Total cholesterol (mg/dl)				0.022[Q]
≥200	66 (48.2)	36 (40.4)	30 (62.5)	
HDL (mg/dl)				0.005[Q]
<50	58 (42.3)	46 (51.7)	12 (25)	
LDL (mg/dl)				0.344[Q]
≥130	54 (39.4)	32 (36)	22 (45.8)	
Triglycerides (mg/dl)				0.657[Q]
≥150	41 (29.9)	25 (28.1)	16 (33.3)	
Systolic pressure (mmHg)				0.922[Q]
≥130	35 (25.5)	22 (24.7)	13 (27.1)	
Diastolic pressure (mmHg)				0.922[Q]
≥85	35 (25.5)	22 (24.7)	13 (27.1)	
Glycemia (mg/dl)				0.852[Q]
≥110	12 (8.8)	7 (7.9)	5 (10.4)	
Metabolic syndrome*	48 (35)	32 (36)	16 (33.3)	0.905[Q]

P values refer to [Q]Tests Chi-square test of independence and [F]Fisher's exact test. *Occurrence of at least three of the following signs: Abdominal circumference >88 cm, ≥130 mmHg systolic pressure, diastolic pressure ≥85 mmHg, triglycerides ≥150 mg/dl, HDL<50 mg/dl, and glycemia ≥110 mg/dl. HDL: High-density lipoprotein, LDL: Low-density lipoproteins

Table 4: Risk scores of Framingham in women from 40 to 65 years, in the pre- and post-menopausal, in private clinic of gynecology in Betim/MG and igarape/MG

Variables	All sample (n=137), n (%)	Premenopause (n=89), n (%)	Postmenopause (n=48)	P
Risk of CVD (10 years)				
Low	124 (90.5)	83 (93.3)	41 (85.4)	0.219[F]
Intermediate/high*	13 (9.5)	6 (6.7)	7 (14.6)	
Cardiovascular risk	3.9±3.9	3.3±2.5	6.3±3	<0.001[W]

P-values refer to the tests: [F]Fisher's exact test and [W]Wilcoxon Mann-Whitney test for independent samples. *Only three patients had a high risk. CVD: Cardiovascular disease

Table 5: Risk factors for cardiovascular disease (not included in the obtaining of the Framingham risk score) according to categories of risk of Framingham in women 40 to 65 years, in the pre- and post-menopausal, in medical private office of gynecology in Betim/MG

Variables	Low risk (*n*=124), *n* (%)	Intermediate/high risk (*n*=13), *n* (%)	*P*
BMI (kg/m^2)	26±7	28±4	0.121^W
Abdominal circumference (cm)	93.3±11.7	98.6±8.1	0.044^T
Current drinker	34 (27.4)	4 (30.8)	0.754^F
Physical activities practice	80 (64.5)	8 (61.5)	1.000^F
Family history of CVD	101 (81.5)	12 (92.3)	0.465^F
Postmenopause	41 (33.1)	7 (53.8)	0.220^F
Glycemia	85.5±14	96±36	0.033^W
Triglycerides	104±70.8	142±73	0.007^W
Metabolic syndrome	35 (28.2)	13 (100)	<0.001^F

P-values refer to the tests: ^{F}Fisher's exact test and ^{W}Wilcoxon Mann-Whitney test (data presented as median±ID) and ^{T}*t*-Student (data presented as mean±SD) for independent samples. BMI: Body mass index, CVD: Cardiovascular disease, SD: Standard deviation, DI: Interquartile distance

with intermediate risk/high presented MS ($P < 0.001$) [Table 5].

When the components of the MS were evaluated, abdominal circumference >88 cm was observed in 93.6% of women followed by HDL-c <50 mg/dl (66%), high levels of TG (61.7%), DBP increased (51%), SBP increased (55%) and glucose ≥110 mg/dl (23.4%).

When it was considered the association between WC and other risk factors for CVD, the association between MS and HDL-c was reverse ($r = -0,273$), an increase in WC leads to decreased HDL-c ($P = 0.001$). The WC was related positively with the high levels of TG ($r = 0.207$; $P = 0.015$), SBP ($r = 0.239$; $P = 0.005$), and glucose levels ($r = 0.322$; $P < 0.001$), indicating that the increase of these parameters was related to the increase in the WC.

Discussion

Organic variables that define the cardiovascular risk (TC, HDL-c, LDL-c, TG, and glycemia) usually arise or worsen in the climacteric period, resulting in an increase in the occurrence of cardiovascular events in women.[15] Before the menopause, the values of TC and LDL-c levels are lower in women when compared to men in the same age range, and the HDL-c is higher among women. The postmenopause is a period of relative hyperandrogenism, as a consequence of the decline of estrogens, in comparison to the androgens, which can lead to the formation of atherosclerosis, with increased levels of LDL-c and TC, and decrease in the levels of HDL-c.[16]

In this study, the mean age was 49 years, 35% in postmenopausal. High levels of TC were observed in 48.2%, being higher among those in postmenopausal. Reduced HDL-c was observed in 42.3% of the women, being smaller among postmenopausal. The mean values of TG were higher in women after menopause as well as LDL-c; however, the differences were not statistically significant.

Comparing these results with studies performed in the Brazilian National Health System, a retrospective study conducted in 164 women, 69.5% in postmenopausal. The mean age was 61 years. It was also observed an increase of risk factors for CVD in postmenopausal and some with greater severity as the levels of TC (59.6%) and LDL-c (58.8%). The levels of HDL-c were considered below the ideal in 61.4% and TG levels were elevated in 48.2% of them.[17]

The same was observed in another retrospective study carried out in 100 women, aged 45–60 years, being 55% in postmenopausal. When the biochemical components were analyzed, it was observed the elevation of serum levels of TC (78%), with a greater percentage among those in postmenopausal, and rates of LDL-c increased in 81% of the participants, that was also higher among those in postmenopausal.[7]

In this study, women in postmenopausal showed greater cardiovascular risk. Considering the other risk factors that did not comprise the FRS, it was observed in women with intermediate risk/high, higher values of WC ($P = 0.044$), fasting glycemia (0.033), and TG ($P = 0.007$). It was also observed that all women with intermediate risk/high had MS. According to Wilson *et al.*,[13] it is estimated that half of all cardiovascular events in women is related to the MS. Some studies[7,17] used the FRS to estimate the absolute risk for the development of ischemic coronary disease, or death as a result, in 10 years. Versiani *et al.*[17] showed that 17.5% of women in postmenopausal presented high cardiovascular risk and 48.2% intermediate risk. Piazza *et al.*[7] demonstrated a higher cardiovascular risk in postmenopausal women.

Meta-analysis[18] held in 46,000 men and 11,000 women of 17 prospective studies showed that high levels of TG were associated with an increase in cardiovascular risk of 30% for men and 75% for women. A study carried out

in Iran with 940 women aged between 20 and 76 years observed that 95.4% of women in postmenopausal presented values of TG increased.[19] Although in this study, the difference between the mean values of TG in pre- and post-menopausal were not verified, when evaluated the cardiovascular risk, it was observed that high levels of TG were related with intermediate/high risk of CVD based on the FRS. It was also observed that the increase in the WC correlated positively with high levels of TG.

In a systematic review,[20] the increase of glycemia in the menopausal transition was observed in all studies. The studies that showed major changes of fasting glycemia in the menopausal transition were the population-based study carried out in Iran:[19] premenopausal (25.5%) and postmenopausal (60.3%) and in Poland:[21] premenopausal (13%) and postmenopausal (55%). When considering the means of fasting plasma glucose levels, the lowest values were recorded in a cohort study conducted in the Netherlands:[22] premenopausal (75.6 mg/dL) and postmenopausal (84.6 mg/dL). Higher results were observed in a population-based study carried out in Iran:[23] premenopausal (103 mg/dL) and postmenopausal (114 mg/dL), and in India:[24] premenopausal (102 mg/dL) and postmenopausal (123 mg/dL). In this study, the percentage of women with high fasting glycemia was similar among premenopausal and postmenopausal period, but considering the cardiovascular risk, the glycemia presented higher values for women with intermediate risk/high, and it was observed that the increase of WC was related positively with fasting glycemia.

Overweight and especially abdominal obesity correlate with the majority of the cardiovascular risk factors, mainly with high levels of TG and reduced levels of HDL-c, showing a greater impact also on BP elevation.[25] In menopause, changes in body fat distribution may increase the risk of CVD and metabolic disorders. During the menopausal transition, the form of body fat distribution of women seems to modify, presenting a tendency to accumulate in the abdominal region. The transition to the menopause does not contribute directly to weight gain but for the redistribution of body fat, with more deposition in the abdominal region.[26]

In this study, 87.6% presented WC values >80 cm and WC >88 cm (67.2%). There was no difference in the proportion of WC >88 cm in the pre- and post-menopausal women. It was also observed that postmenopausal showed higher cardiovascular risk when compared to premenopausal, being verified higher values of abdominal circumference in women with intermediate risk/high. It was also observed a positive correlation between WC with TG, SBP, and fasting blood glucose levels, indicating that the increase of these parameters was associated to the increase of WC. Another study carried out in 165 menopausal women in Iran also observed a positive and significant correlation with SBP ($r = 0.26$; $P = 0.02$) and DPB ($r = 0.16$; $P = 0.05$).[27]

The menopausal transition is associated to a significant weight gain (2–2.5 kg on average), concomitantly, there is an increase in adiposity and a decrease in energy expenditure.[28] Weight gain and obesity drove the increase of MS in postmenopausal women.[29] Thus, such phenomena have been identified as essential to explain increased risk of SM and increased levels of TC and TG, and the menopause has been considered a predictor of SM, regardless of age in women.[19] In this study, women with MS showed higher WC and higher levels of SBP, DBP, TG, and fasting glycemia. The WC was increased by 93.6% of the women with MS. In addition, based on the FRS, all women with intermediate/high risk had SM. When considered the association between WC and risk factors for CVD, the increase in WC led to a decrease in HDL-c. The reduced HDL-c occurred in greater proportion in postmenopausal women; however, the levels of HDL-c in the sample were high, which contributes to the reduction of the risk of coronary disease. In a systematic review to assess the prevalence of MS and its components in the menopausal transition, the majority of studies presented in the menopausal transition increase at the measure of WC and levels of BP, TG, and glycemia, besides reducing the levels of HDL-c.[20] It was also found in another study that evaluated women in menopause, abdominal obesity in 76.6% of women in premenopausal women and 85.2% in postmenopausal women.[15] Cohort study with 1276 women carried out in the Netherlands found that in the premenopausal period the mean of WC was 78.4 cm (±11.3), while in postmenopausal women was 86.1 cm (±11.5).[22] On the other hand, in Asian women abdominal obesity was lower, that is, 16.4% premenopause and 29.1% postmenopause[30] and may be related to the lifestyle of Asian women.

Observational studies of climacteric women have as a limitation the difficulty of precise determination of the onset of menopause and occurrence of menopause (last menstrual period). The beginning of the climacteric ends up being confused with age, and the menopause can be influenced with the use of HT. The small number of patients who used HT did not allow the completion of analyzes considering the use or not of HT. Another limitation relates to the use of a convenience sample; however, the results corroborate with the findings reported in the literature with relation to increased cardiovascular risk in postmenopausal women.

Cardiovascular risk factors are neglected in women, especially during the transition of menopause, when the susceptibility to cardiovascular events increases. In Brazil, the CVD is the major causes of mortality and postmenopausal women presented higher values of cardiovascular events when compared to premenopausal women. As a result, it is justified the investigation of factors of cardiovascular risk in women in the pre- and post-menopausal period, to clarify the main risk factors for CVD and reflect on the possible interventions of health professionals in the modifiable risk factors, considering lifestyle changes that lead to the alteration, in the long term, of cardiovascular phenomena of this population, to reduce the morbidity and mortality of cardiovascular events.

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Conflicts of interest

There are no conflicts of interest.

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