

## **Anthropometric Parameters, Blood Pressure and Climacteric Phases of Diabetic and Non-Diabetic Women in the City of Montes Claros- Minas Gerais, Brazil**

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**Abstract:** *Objective: To compare the systemic blood pressure, the anthropometric profile and climacteric phases of diabetic and non-diabetic women; Methodology: Cross-sectional and analytical research which evaluated population corresponds to climacteric women assisted by the Family Health Strategy in the city of Montes Claros, Minas Gerais. The considered variables were: climacteric stage, diabetes mellitus, Race; Education level; religion; marital status; Monthly income; Number of individuals residing in the same house of the interviewee. There was the measurement of height, weight, body mass index, waist circumference and the waist-hip ratio. Furthermore, the pressure parameters of the systolic and diastolic arteries were assessed. Statistical analysis was performed using SPSS software for Windows (version 21). Descriptive analyzes were performed through percentage and comparison analysis between groups by Mann-Whitney, adopting a significance level of  $p < 0.05$ . Results: A total of 898 women were assessed. when the blood pressure of diabetic (45.6%) and non-diabetic women (32.5%) were compared, it was observed that diabetic women are more hypertensive ( $p = 0.001$ ); (64, 0%) of women are in post-menopausal phase ( $p = 0.000$ ) of the climacteric, with anthropometric data such as BMI, WC and WHR in undesirable levels, noting that 50.4% are obese ( $p = 0.000$ ), 93.9% have changed CA ( $p = 0.002$ ) and 84.1% one WHR classified as altered ( $p = 0.000$ ); Conclusion: The analysis evidenced an relation of diabetes mellitus with concomitant presence of obesity assessed by BMI, with the change of CA and WHR, with systemic hypertension and post-menopausal stage in women assisted by FHSs Montes Claros. It highlights the importance of a more frequent health monitoring in menopausal women, as well as a health policy planning aimed at promoting, preventing and early diagnosis of these diseases.*

**Keywords:** *Climacteric; Diabetes mellitus; Anthropometric profile, systemic blood pressure.*

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### **1. INTRODUCTION**

The menopause corresponds to a stage of a woman's life in which there is a transition from the reproductive to non-reproductive period, characterizing not a pathological, but a biological stage in life (Nosse et al, 2009). The period before this phase is called perimenopause, it occurs around the age of 40 and extends until one year after the last menstrual period, while the called postmenopausal is defined by some authors as the five years after the last menstrual period (Secretaría de Salud, 2002; The North American Menopause, 2010; Harlow, 2012; The North American Menopause, 2012 ).

In the United States, it is believed that over 20 million women are in menopause period and there are estimates that this data will reach around 60 million in 2020 (Liu et al, 2014). In Brazil, according to data released by government agencies related to health, in 2012 Brazilian women corresponded to about 51.0% of the total population, with around 36.7% (36,289,992 women) being among the 35-65 year-old age group, which its average usually covers perimenopause. However, there are no limits set for menopausal period starting and ending (Datusus, 2014).

It is estimated that the prevalence of Diabetes Mellitus in the countries of Central and South America have values that approximate to 26.4 million people, with prospects that this data reaches the value of 40 million in 2030. In Europe and the United States, it is believed that this increase will take place especially in the older age groups, corresponding with the increase in life expectancy. In developing countries, this increase will occur in all age groups; the prevalence will be tripled in the 45-64 year-old group, and doubled in the 20-44 and over 65 year-old age groups (International Diabetes Federation, 2014).

Study on the prevalence of Diabetes Mellitus in Brazil confirmed the predominance of females over males (Pinho et al, 2014). In addition, the literature points out that metabolic and hemodynamic changes such as hyperglycemia, hypertension, obesity and dyslipidemia, are more prevalent among women in post-menopausa (Rocha, 2012; Andrade et al, 2013).

The Hypoestrogenism, that triggers the climacteric period and is accentuated after definitive installation of menopause, triggers metabolic changes such as increased body fat with predominant visceral deposition, which associated with physical inactivity, poor diet and the change in lipid profile contribute to increased cardiovascular risk (Molz et al, 2013).the body fat with predominant location in the abdominal region was directly related to the development of cardiovascular diseases, diabetes, dyslipidemia, metabolic syndrome and some neoplastic types (Jansen et al, 2002; Moore et al, 2004).

Hypertension is considered to be one of the most important cardiovascular risk factors, relating to 25% of heart disease and 40% of cases of cerebrovascular accidents (Santos et al, 2014). Its expression is common after menopause, a fact explained by the androgen / estrogen increasing, changes in renin-angiotensin system, increased endothelin, oxidative stress, obesity and other common metabolic changes in this period of feminine life (Meirelles, 2014).

Due to high prevalence of diabetes mellitus, highly manageable chronic condition but if incorrectly controlled leads to significant loss of individual life quality and life expectancy, and which through such pathological process is often present in the climacteric group has significant metabolic changes, this study aimed to compare the blood pressure, anthropometric and climacteric stages of diabetic and non-diabetic women.

## 2. METHODS

Comprises a transversal and analytical research that involved a population of 30,018 female individuals, climacteric and assisted by the Family Health Strategy (FHS) in the city of Montes Claros, Minas Gerais, Brazil.

There was a selection by conglomerate between 73 FHS in the city, including both rural and urban areas, which resulted in the selection of 25 FHS. In a second step, through a simple random drawing among women registered within their FHS previously selected, groups were divided according to the stage of menopause (pre, peri and post-menopausal), this sample included 898 women.

The study was conducted between August 2014 and January 2015. In the field work, five academic interviewers (volunteers) of undergraduate courses in the health area, trained by the study coordinator and supervised by a graduated professional in medical school, using a private and suitable environment provided by the FHS, applied validated standardized questionnaires to the interviewed.

The considered variables were: climacteric stage (pre, peri and post menopause), the classification of diabetes mellitus referred (yes, no), race (White, Mulatto; Black; Another color); Level of education (elementary school (incomplete); middle school (completed); High school with higher education), religion (Catholic, Evangelical, Other religions, no religion), marital status (Married, Separated, divorced, widow) ; monthly income (over or equal to 724.00; Less than 724.00); number of individuals residing in the same household of the interviewee (Up to 2; more than 2).

There was the height measurement with the help of the CEAS 206 anthropometer on a wall ninety degrees relative to the floor and without footers, having the woman stand in the proper position for the data evaluation; Weight measurement (kg) using portable scale SECA OMEGA 870 digital, body mass index (BMI) taken by the result of dividing body weight by height squared ( $B / H^2$ ) occurring classification of surveyed in proper weight (from 18.5 to 24 , 9), overweight (25.0-29.9) and obesity (30,0- 39.9) (World Health Organization, 1998).

## Anthropometric Parameters, Blood Pressure and Climacteric Phases of Diabetic and Non-Diabetic Women in the City of Montes Claros- Minas Gerais, Brazil.

The waist circumference (WC) and waist-hip ratio (WHR) also were obtained by the millimeter inelastic tape in regions with standardized technique. Values greater than 0.80 in WHR and 80 cm in WC were classified as unsatisfactory and taken as predictive of risk of chronic disease (Molarius et al, 1999).

In addition, systolic and diastolic blood pressure was gauged (mmHg) from the sample in a systematic way. Blood pressure (BP) was measured with the calibrated, arm, digital and automatic MicroLife, tried and tested by British Hypertension Society (BHS, 2007). Three measures were carried out, with a five-minute interval between them, on the left upper limb and sitting position; for statistical analysis, the mean of the last two measurements were considered. Following the recommendations of the VI Brazilian Guidelines on Arterial Hypertension, the bloody pressure was considered great when the values were less than 120x80 mmHg; Normal and borderline to values up to 139X89 mmHg and Systemic Arterial Hypertension for values equal and greater than 140X90 mmHg (Sociedade Brasileira de Cardiologia et al, 2010).

### 2.1. Statistical Analysis

Statistical analysis was performed using SPSS for Windows (version 21). Descriptive analyzes were performed through percentage and comparison analysis between groups by Mann-Whitney, adopting a significance level of  $p < 0.05$ .

### 2.2. Ethical Aspects

This study was approved by the Ethics Committee of the Faculdades Integradas Pitágoras, in the city of Montes Claros at number 817.666. All women of this study sample signed a Free and Clarified Consent Agreement, after receiving verbal and written explanations regarding the study.

## 3. RESULTS

The sample consisted of 898 women. 61.6% identified themselves as being mulatto. 39.9% reported having incomplete primary education, having 25.7% completed elementary school and 31.3% high school and college. About 64.8% women reported belonged to Catholic religion, 62.1% said they were married and 24.2% live with less than 724,00 reais monthly. It was found that 54.1% women live in a house with more than two people.

**Table 1.** Socio-economic data of climacteric women subscribed in FHSs of Montes Claros-MG, 2015.

Variables		N	%
Race	White	154	17,1
	Mulatto	553	61,6
	Black	112	12,5
	Other	49	5,5
Level of education*	High school and Superior	281	31,3
	middle school	231	25,7
	Elementary school	358	39,9
Religion*	Catholic	582	64,8
	Evangelical	221	24,6
	Other religions	58	6,5
	no religion	9	1,0
Marital Stage *	Married	558	62,1
	Separated, divorced	135	15,0
	Widow	93	10,4
Income*	Over or equal to 724	128	14,3
	Less than 724	217	24,2
People that live in the house	Up to 2	376	41,9
	More than 2	486	54,1

\*: non-responding; n: sample

By comparing diabetic (45.6%) and non-diabetic (32.5%) women, considering their pressure levels, it was observed that women with diabetes are more hypertensive ( $p = 0.001$ ). Most of the analyzed diabetic women (64.0%) are in post-menopausal phase ( $p = 0.000$ ) of climacteric with anthropometric data such as BMI, and RCQ in undesirable levels, evidencing that 50.4% are obese ( $p = 0.000$ ), 93.9% have changed CA ( $p = 0.002$ ) and 84.1% a WHR classified as altered. ( $p = 0.000$ ).

**Table2.** Analysis of anthropometric data, hypertension and stages of menopause among diabetic and non-diabetic women.

Variables	Classification	Diabetics		Non diabetics	
		n	%	n	%
Systemic Arterial Hypertension*	Great	13	11,4	164	20,9
	Normal and borderline	49	43,0	341	45,6
	Hypertension	52	45,6	243	32,5
Climacteric phases *	Pre menopausal	17	14,9	216	29,1
	Perimenopausal	24	21,1	215	29,0
	Pos menopausal	73	64,0	311	41,9
BMI*	Adequate	15	13,3	213	28,4
	overweight	41	36,3	290	38,7
	Obesity	57	50,4	246	32,8
WC*	Normal	7	6,1	131	17,5
	Altered	108	93,9	618	82,5
WHR*	Normal	18	15,9	307	41,0
	Altered	95	84,1	442	59,0

\*: non-responding; n: sample

**Table3.** Comparison of hypertension, climacteric phases and anthropometric profile between diabetic and non-diabetic women.

	Diabetes	n	MeanRank	P
Blood pressure	Presence	114	496,40	0,001*
	Absence	748	421,61	
Climacteric phases	Presence	114	517,28	0,000*
	Absence	742	414,86	
IMC	Presence	113	516,80	0,000*
	Absence	749	418,63	
CA	Presence	115	475,20	0,002*
	Absence	749	425,94	
WHR	Presence	113	525,35	0,000*
	Absence	749	417,34	

\*: non-responding; n: sample

#### 4. DISCUSSION

Changes in body composition and blood pressure levels are considered manageable, modifiable and can be understood as indirect markers of ambulatory care quality, (mainly primary health care) being that the understanding of biophysical profile and comorbidities of these patients allows clarify aspects of assistance given to menopausal women with diabetes mellitus and then contribute to its improvement.

It was observed high levels of WHR, WC and BMI, as well as not transmissible chronic disease such as systemic arterial hypertension among the surveyed with diabetes mellitus. These results were against the Molz and Poll findings that also showed the presence of a high cardiovascular risk in the climacteric group (Molz et al, 2013).

The risk of developing diabetes mellitus is higher in the female population to the extent that it becomes mature, being associated with other factors such as central obesity and sedentary lifestyle (Pardini, 2013) menopausal status is considered a risk factor for metabolic disorders, affecting negatively the blood pressure parameters, glucose tolerance and lipid profile (Lobo, 2013).

This fact, associated with the aging process, which by itself increases the risk of chronic diseases occurrence, especially in individuals who do not maintain a healthy lifestyle, can explain this biophysical profile and comorbidities evidenced by this research (Pereira et al, 2008).

The data relating to the variables BMI, WHR, and WC were similar to those observed in other studies (Ben Ali et al, 2014; Montilla et al, 2003; Lorenzi et al, 2005) and reinforce that the onset of menopause is an opportunity for the development and implementation of prevention strategies aimed at improving life quality and increasing longevity of patients. Obesity, metabolic syndrome, diabetes and cardiovascular diseases are issues of great interest and impact in this age group and population (Lobo et al, 2014).

Systemic arterial hypertension and diabetes mellitus include clinical conditions that are commonly seen in population in a joint manner (Prisant et al, 1999; Sowers et al, 2001) and associated with this data it is evidenced in the literature that menopause can be considered a risk factor for coronary artery disease, by the potential effects of ovarian senescence on cardiac function, blood pressure and metabolic parameters, such as glucose tolerance and lipid profile (Pardini, 2013).

The variables obtained in this study are explained especially by the high rates of hypertension in diabetic menopausal women. It is also noticed that these metabolic changes and pressure represent potential risk factors for cardiovascular disease and is associated with significantly higher rates of mortality (Guimarães et al, 2013; Ribeiro et al, 2012; Volp et al, 2012).

The appearance of permanent arterial blood pressure elevations concurrently the installation of the climacteric period is frequent (Beaufils, 2006). The study Hidalgo et al (2006), With a significant sample of menopausal women, especially post-menopausal, identified a prevalence of 38.8% of hypertension in this group.

In this research, it is noted that certain limitations can be highlighted regarding the interpretation of the results presented in a transversal study. One inherent limitation is displayed regarding if the confirmation of the changed effect of the study variables actually is the cause of diabetes mellitus presence. However, the design and the methodology used in this research were adequate to attend the proposed objectives and to provide important results for handling and emplacements of future cohort studies.

Also, we have to consider the relevance of the study seen that this is an important issue, and because it is a survey of a representative sample of the population of menopausal women registered health facilities of a city in southeastern Brazil.

Thus, it is suggested to perform longitudinal studies on obesity, climacteric phases and hypertension in diabetic women and possible risk factors in representative samples of the climacteric population, allowing greater knowledge on the subject. It is noteworthy that these studies need to be carried out in different cities and regions, aiming to provide information specific to each region.

## **5. CONCLUSION**

The present study showed a relationship of diabetes mellitus, with the concomitant presence of obesity analyzed by BMI, with the change of WC and WHR, with systemic arterial hypertension and the phase of post-menopausal women assisted by FHSs in Montes Claros.

Faced the findings of this research, it is highlighted the importance of a more frequent monitoring by the health field to climacteric women, aiming at contributing to the planning of actions, health programs and policies for the promotion, prevention and early diagnosis of these diseases.

## **REFERENCES**

- [1] Andrade, J.P.; Mattos, L.A.; Carvalho, A.C.; Machado, C.A.; Oliveira, G.M.; Programa Nacional de Qualificação de Médicos na Prevenção e Atenção Integral às Doenças Cardiovasculares. Arquivos Brasileiros de Cardiologia. 100 (3), 203-11. (2013).
- [2] Bauufils, M. Hypertension in women after menopause. Presse Med. 35, 1055-60, (2006).
- [3] Ben Ali, S.; Belf-Benali.; Aounallah-Skhiri, Traissac, P.; Maire, B.; Deupeuche, F.; Achour, N.; Romdhane, H.B.; Menopause and Metabolic Syndrome in Tunisian Women. BioMed ResearchInternational. 2014. (2014).
- [4] Datasus. Indicadores e Dados Básicos - Brasil – 2012 IDB-2012. Disponível em: <http://tabnet.datasus.gov.br/cgi/ibd2012/matriz.htm>> Acesso em: 07 de agost. (2014).
- [5] Guimarães, A.A.; Bortolozzo, E.A.; Lima, D.. Prevenção de fatores de risco para doenças cardiovasculares: programa de nutrição e prática de atividade física para servidores de uma universidade pública do estado do Paraná. RevistaEletrônica FAFIT-FACIC. 4 (1), 10-8. (2013).
- [6] Harlow S.D., Gass M., Hall J.E., Lobo R., Maki P., Rebar R.W. STRAW + 10 Collaborative Group Executive summary of the Stages of Reproductive Aging Workshop + 10: addressing the unfinished agenda of staging reproductive aging. Menopause. 19 (4), 1-9. (2012).
- [7] Hidalgo, LA; Chedraui, PA; Morocho, N; Alavarado, M; Chavez, D, Huc, A.The metabolic syndrome among postmenopausal women in Ecuador.GynecolEndocrinol. 22, 447-54. (2006).

- [8] International Diabetes Federation. Diabetes atlas update 2012: Regional & Country Facctsheets. Disponível em: <<http://www.idf.org/diabetes-atlas-update-2012-regional-countryfactsheets>>. Acessoem: 05 julh. (2014).
- [9] Jansen, I; Katzmarzyk, PT, Ross, R. Body mass index, waist circumference, and health risk. *Arch Intern Med.* 162 (18), 2074-2079. (2002).
- [10] Liu, K.; He, L.; Tang, X.; Wang, J.; Li, N.; Wu, Y. Relationship between menopause and health-related quality of life in middleaged Chinese women: a cross-sectional study. *BMC Women's Health.*14 (1), 7. (2014).
- [11] Lobo, R.A.; Davis, S.R.; De Villiers, T.J.; Gompel, A.; Henderson, V.W.; Hodis, H.N.; Lumsdem, M.A.; Mack, W.J.; Shapiro, S.; Baber, R.J. Prevention of diseases after menopause. *Climacteric.* 27, 1-17. (2014).
- [12] Lobo, R.A. Where are we 10 years after the Women's Health Initiative? *The JournalofClinicalEndocrinology&Metabolism.* 98 (5). (2013).
- [13] Lorenzi, DRS; Danelon, C; Saciloto, B; Padilha Junior, I. Fatores indicadores da sintomatologia climatérica. *Revista Brasileira de Ginecologia e Obstetrícia.* 27 (1). (2005).
- [14] Meirelles, R.M.R. Menopausa e síndrome metabólica. *Arquivos Brasileiros de Endocrinologia e Metabologia.* 58 (2). (2014).
- [15] Molarius, A.; Seidell, J. C.; Sans, S.; Tuomilehto, J.; Kuulasmaa, K. Waist and hip circumferences, and waist-hip ratio in 19 populations of the WHO MONICA project. *InternationalJournalofObesity.* 23 (2), 116-125, (1999).
- [16] Molz, A.P.; Poll, F.A. Avaliação nutricional, estilo de vida e consumo alimentar relacionados com risco cardiovascular em mulheres na menopausa. *Revista do Departamento de Educação Física e Saúde e de Mestrado em Promoção de Saúde da Universidade de Santa Cruz,* 14 (4). (2013).
- [17] Montilla, RNG; Marucci, MFN; Aldrighi, JM.Avaliação do estado nutricional e do consumo alimentar de mulheres no climatério. *Revista Assoc. MedicinaBrasileira.* 49 (1). (2003).
- [18] Moore, LL; Bradlee, ML; Singer, MR; Splansky, GL; Proctor, MH; Ellison, RC; Kreger, BE. BMI and waist circumference as predictors of lifetime colon cancer risk in Framingham Study adults. *Int J ObesRelatMetabDisord.* 28 (4), 559-567. (2004).
- [19] Nosse, T.M.; Moreira, S.L.N.; Andrade, K.C. Avaliação dietética de mulheres climatéricas atendidas em uma clínica-escola de nutrição no município de São Paulo. *Revista Brasileira de Ciências da Saúde.* 7 (21), 26-31, (2009).
- [20] Pardini, D.P;. Terapia de reposição hormonal na menopausa. *Endocrinologia Clínica.* Lucio Vilar, 5ª ed. Rio de Janeiro: Guanabara Koogan (2013).
- [21] Pereira, J.C; Barreto, SM; Passos, VMA. O Perfil de Saúde Cardiovascular dos Idosos Brasileiros Precisa melhorar: estudo de base populacional. *Arquivo Brasileiro de Cardiologia.* 91 (1). (2008).
- [22] Pinho, C.P.S.; Petribu, M.M.V.; Diniz, A.S.; Arruda, I.K.G.; Leite, A.P.D.L.; Obesidade visceral: aspectos epidemiológicos e (y) terapêuticos. *Salud(i)Ciencia.* 20, 512-517. (2014).
- [23] Prisant, LM; Louard, RJ.Controversies surrounding the treatment of the hypertensive patient with diabetes. *CurrHypertens Rep.* 1. (1999).
- [24] Ribeiro, A.G.; Cotta, R.M.; Ribeiro, S.M. A Promoção da Saúde e a Prevenção Integrada dos Fatores de Risco para Doenças Cardiovasculares. *Ciência & Saúde Coletiva.* 17 (1), 7-17. (2012).
- [25] Rocha, E. Síndrome metabólica: a sua existência e utilidade do diagnóstico na prática clínica. *Revista Portuguesa de Cardiologia.* 31 (10), 637-9. (2012).
- [26] Santos, A. D.; Santana; W.B.; Santos, A.M.D.; Silva, G.M.S.; Santos, M.B. Avaliação de risco cardiovascular em idosos segundo os critérios de Framingham. *Scientia Plena,* 10 (10), 1-10. (2014).
- [27] Secretaría de Salud. Norma Oficial Mexicana NOM-035-SSA2-2002. Prevención y control de enfermedades en la perimenopausia y postmenopausia de la mujer. Criterios para brindar la atención médica. México: Secretaría de Salud. (2002).

- [28] Sociedade Brasileira de Cardiologia; Sociedade Brasileira de Hipertensão; Sociedade Brasileira de Nefrologia. VI Brazilian Guidelines on Hypertension. Arquivos Brasileiros de Cardiologia. 95(1Suppl):1-51, (2010).
- [29] Sowers, JR; Epstein, M, Frohlich, ED. Diabetes, hypertension and cardiovascular disease: an update. Hypertension. 37, 1053. (2001).
- [30] The North American Menopause Society. Management of osteoporosis in postmenopausal women: 2010 position statement of the North American Menopause Society. Menopause; 17 (1), 23-4. (2010).
- [31] The North American Menopause Society. The 2012 Hormone Therapy Position Statement of The North American Menopause Society. Menopause: The Journal of The North American Menopause Society. 19 (3), 257-71. (2012).
- [32] Volp, A.C.; Brito, C.J.; Roas, A.F.; Córdova, C.; Ferreira, A.P. Estilo de vida e síndrome metabólica: exercício e tabagismo como moduladores da inflamação. Journal of the Health Sciences Institute. 30 (1), 68-73. (2012).
- [33] World Health Organization. Obesity: preventing and managing the global epidemic (report of a WHO consultation on obesity). Geneva: World Health Organization; (1998).

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