Risk factors for hypertensive disorders of pregnancy in Southern Brazil

Caroline Abrão Dalmáz[1], Kátia Gonçalves dos Santos[1], Mariana Rodrigues Botton[2], Israel Roisenberg[3]

[1] PhD in Genetics and Molecular Biology; Professors, Centro Universitário LA SALLE, Canoas, RS, Brazil
[2] MSc, PhD Student in Genetics and Molecular Biology, Universidade Federal do Rio Grande do Sul (UFRGS), Porto Alegre, RS, Brazil
[3] Post-doctorate in Genetics and Molecular Biology; Professor, UFRGS, RS, Brazil

Summary

Objective: The aim of the study was to identify the frequency of risk factors for hypertensive disorders in pregnancy in Southern Brazil. **Methods:** The study included 161 patients with hypertensive disorders and 169 control subjects matched by age and ethnicity. The frequency of the risk factors was compared by Fisher's exact test, chi-square and Student's *t* test. A multivariate logistic regression analysis assessed the independent role of clinical, social and demographic factors which were associated with occurrence of the hypertensive disease in pregnancy in the univariate analysis. **Results:** Patients enrolled in the study were predominantly Caucasian (73%) and the mean age was 29. In the multivariate analysis, the variables associated were: family history of preeclampsia (p = 0.001; OR = 3.88; 95% CI = 1.77-8.46), diabetes (p = 0.021; OR = 3.87; 95% CI = 1.22-12.27) and chronic hypertension (p = 0.002; OR = 7.05; 95% CI = 1.99-24.93). **Conclusion:** The risk factors associated with hypertensive disorders in pregnancy appear to be similar to those reported in other countries. The knowledge of the risk factors could be helpful in a prenatal care.

Keywords: Hypertension, pregnancy-induced; risk factors; Brazil.

Resumo

Fatores de risco para distúrbios hipertensivos durante a gravidez no Sul do Brasil

Objetivos: Identificar a frequência dos fatores de risco para distúrbios hipertensivos durante a gravidez na região Sul do Brasil. **Métodos:** O estudo incluiu 161 pacientes com distúrbios hipertensivos e 169 controles, compatíveis em idade e etnia. A frequência dos fatores de risco foi comparada a partir do teste exato de Fisher, teste qui-quadrado e teste *t* de Student. Uma análise logística multivariacional de regressão avaliou a influência de fatores clínicos, sociais e demográficos, associados com a ocorrência de doenças hipertensivas durante a gravidez na análise univariada. **Resultados:** Os pacientes envolvidos no estudo eram predominantemente caucasianos (73%) e a idade média foi 29 anos. Na análise multivariada as variáveis associadas foram: histórico de pré-eclâmpsia na família (p = 0,001; OR = 3,88; 95% IC = 1,77-8,46), diabetes (p = 0,021; OR = 3,87; 95% IC = 1,22-12,27) e hipertensão crônica (p = 0,002; OR = 7,05; 95% IC = 1,99-24,93). **Conclusão:** Os fatores de risco associados a distúrbios hipertensivos durante a gravidez parecem ser similares àqueles relatados em outros países. O conhecimento sobre os fatores de risco pode ser útil durante o acompanhamento pré-natal.

Unitermos: Hipertensão, induzida pela gravidez; fatores de risco; Brasil.

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Correspondence to:
Caroline Abrão Dalmáz
Av. Grécia, 1100 – apto. 1407
CEP: 91350-070
Porto Alegre, RS, Brazil
carolabrao@yahoo.com.br

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Introduction

The hypertensive disorders of pregnancy affect up to 8% of all gestations and are the second leading cause, after embolism, of maternal mortality in United States, accounting for almost 15% of such deaths[1,2]. Expectant mothers with hypertension are predisposed toward the development of potentially lethal complications, mainly *abruptio placentae*, disseminated intravascular coagulation, cerebral hemorrhage, hepatic failure, and acute renal failure[3].

Hypertension during pregnancy, particularly preeclampsia, is one of the major obstetrical problems in less-developed countries and the causes of most cases remain unknown[4]. Obstetricians are attempting to early recognize and diagnose this complication. However, biophysical and biochemical tests have been suggested to identify women who are at increased risk of developing of this complication in the future. Unfortunately, some of these tests are invasive whereas others require expensive techniques or special expertise that preclude their utility in routine screening[4,5]. In addition, the results of the pooled data for the various tests studied suggest that many of them have poor sensitivity and poor predictive value[4,5].

Several risk factors have been described as predisponent to hypertensive disorders in pregnancy worldwide, such as: family history of preeclampsia[4], preeclampsia in a previous pregnancy[6,7], multifetal gestation[6,8,9], obesity[10], nulliparity[11], diabetes[11,12], chronic hypertension[6,12], and extremes of maternal age[4]. The knowledge of the most important risk factors in our population could be useful to identify the patients who have higher chances to develop the hypertensive disorders, and, subsequently, adequate prenatal care could contribute to decrease this mortality ratio. However, reports designed to identify risk factors for hypertensive disorders of pregnancy in our country are scarce[13,14]. Therefore, the aim of the present study was to identify the frequency of risk factors for hypertensive disorders in Southern Brazil.

Methods

A prospective case-control study was developed considering 161 patients with hypertensive disorders and 169 control subjects matched by age and ethnicity. Subjects were recruited in the maternity of a tertiary public hospital in Southern Brazil (Hospital Nossa Senhora Conceição) and they were followed until 90 days postpartum (late puerperium), since PE can occur after childbirth. The hypertensive disorders in pregnancy were classified according to the proposal of the ACOG[15]. The outcome was the occurrence of mild preeclampsia, severe preeclampsia, non-proteinuric gestational hypertension, chronic hypertension with mild preeclampsia superimposed and chronic hypertension with severe preeclampsia superimposed. At enrollment, a standardized questionnaire provided informations on age, weight, height, schooling (divided by levels and if completed or not), ethnicity, smoking habits, and known risk factors for hypertension in pregnancy. Body mass index (BMI) was calculated considering the values of weight and height obtained at the first appointment, and results were described as mean BMI. All subjects gave their written informed consent to be included in the study, and protocol was approved by the ethics committee of Grupo Hospitalar Conceição and by the National Research Ethics Committee.

The frequencies of risk factors were compared between groups by Fisher's exact test, chi-square and Student's *t* tests. A multivariate logistic regression analysis was performed by a backward conditional procedure to assess the independent role of clinical, social and demographic variables which were significantly associated with hypertensive disease in pregnancy in the univariate analysis, using the SPSS package. The variables tested in the univariate analysis included the family and the previous history of preeclampsia, multifetal gestation, BMI, nulliparity, diabetes, chronic hypertension, smoking (current smoker × non-smoker), schooling (women with at least complete fundamental level, according to Brazilian educational system, were considered as having high schooling) and prenatal care. The continuous variable (BMI) was entered as a linear factor after being tested for nonlinearity, using the SPSS package. The p-values < 0.05 were considered statistically significant.

Results

Patients enrolled in this study were predominantly Caucasian (73%) and the mean age was 29 years (13-48 years). The frequency of cases of hypertensive disorders complicating pregnancy was the following: 58 mild preeclampsia (36.0%), 51 severe preeclampsia (31.7%), 3 eclampsia (1.9%), 7 gestational hypertension (4.3%), and 42 chronic hypertension with preeclampsia superimposed (26.1%).

Table 1 shows the demographical, clinical and social risk factors for hypertensive disorders. The family history of preeclampsia (PE), previous PE history, high BMI, diabetes, chronic hypertension, schooling and prenatal were demonstrated to be more frequent in hypertensive disorders in pregnancy when compared to normotensive women. Regarding nulliparity, multifetal gestation (even so higher in the patients group) and smoking habits, there were no significant differences between patients and controls.

Table 2 provides the characteristics of women with hypertensive disorders in pregnancy compared to normotensive women (with risk estimates calculated by the univariate logistic regression analysis). The family and previous history of PE, high BMI, nulliparity, diabetes, chronic hypertension, schooling and prenatal were