Rev Port Cardiol. 2016;35(9):469–476

Revista Portuguesa de
Cardiologia
Portuguese Journal of Cardiology
www.revportcardiol.org

ORIGINAL ARTICLE

Intake of antioxidant nutrients and coefficients of variation in pregnant women with preeclampsia☆

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Received 30 November 2015; accepted 22 March 2016
Available online 11 August 2016

KEYWORDS
Preeclampsia;
Oxidative stress;
Antioxidants

Abstract
Introduction and Objective: Oxidative stress appears to play a critical role in the pathogenesis of preeclampsia. Evidence suggests that adequate intake of antioxidants can modulate this condition. The objective of this study was to assess the intake of antioxidant nutrients and coefficients of variation in pregnant women with preeclampsia.
Methods: In a cross-sectional study in the public health network of the city of Maceió, Brazil, a dietary survey was performed consisting of 24-hour food recalls, with subsequent adjustment of nutrients using the estimated average requirement as the cutoff point, and a questionnaire on frequency of consumption of antioxidants.
Results: We studied 90 pregnant women with preeclampsia (PWP) and 90 pregnant women without preeclampsia (PWoP) with mean ages of 25.8±6.7 years and 24.1±6.2 years (p=0.519), respectively. A low mean intake of antioxidants (vitamin A, selenium, zinc and copper) was observed in both PWP and PWoP, although intakes of vitamin A (p=0.045) and selenium (p=0.008) were higher in PWoP. In addition, we observed high coefficients of variation in nutrient intakes in both groups, which were higher for vitamin C (p<0.001), vitamin A (p=0.006) and copper (p=0.005) in PWP.
Conclusions: Consumption of antioxidant nutrients by pregnant women with preeclampsia is inadequate, with considerable daily variations in intake, which points to a need for nutrition education strategies aimed at improving intakes, because diet is without doubt a key factor in the modulation of oxidative stress caused by preeclampsia.

☆ Please cite this article as: Cabral Menezes de Oliveira A, Albuquerque Santos A, Rodrigues Bezerra A, Machado Tavares MC, Rocha de Barros AM, Costa Ferreira R. Ingestão e coeficiente de variabilidade de nutrientes antioxidantes por gestantes com pré-eclâmpsia. Rev Port Cardiol. 2016;35:469–476.

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PALAVRAS-CHAVE
Pré-eclâmpsia;
Estresse;
Antioxidantes

Ingestão e coeficiente de variabilidade de nutrientes antioxidantes por gestantes com pré-eclâmpsia

Resumo
Introdução e objetivo: O estresse oxidativo é uma provável via crítica na patogênese da pré-eclâmpsia. Evidências têm sugerido que o consumo adequado de antioxidantes é capaz de modular essa condição. Assim, o objetivo da presente pesquisa foi avaliar a ingestão e o coeficiente de variabilidade de nutrientes antioxidantes por gestantes com pré-eclâmpsia (GCP).
Métodos: Estudo transversal realizado na rede pública de saúde do município de Maceió através de inquérito dietético, com aplicação de: recordatórios alimentares de 24 horas, com posteriores ajustes dos nutrientes pelo método da EAR como ponto de corte, e questionário de frequência de consumo de antioxidantes.
Resultados: Foram estudadas 90 GCP e 90 gestantes sem pré-eclâmpsia (GSP), com médias de idade de 25,8 ± 6,7 anos e 24,1 ± 6,2 anos (p = 0,519), respectivamente. Foram observadas baixas médias de consumo de antioxidantes (vitamina A, selênio, zinco e cobre) para GCP e GSP, apesar do maior consumo de vitamina A (p = 0,045) e selênio (p = 0,008) pelas GSP. Adicionalmente, foram observados elevados coeficientes de variabilidade de consumo para ambos os grupos (GCP *versus* GSP, respectivamente); no entanto, maiores para as GCP de vitamina c (p < 0,001), vitamina A (p = 0,006) e cobre (p = 0,005).
Conclusões: O consumo de nutrientes antioxidantes pelas GCP é inadequado, somado às elevadas variações diárias no seu consumo, resultado que revela a necessidade do desenvolvimento de estratégias de educação nutricional, no sentido de adequar a ingestão, pois a dieta é, sem dúvida, um fator essencial na modulação do estresse oxidativo causado pela condição de pré-eclâmpsia.

Introduction

Preeclampsia is the leading cause of maternal mortality in Brazil, affecting 3-17% of pregnancies. Furthermore, it is one of the main causes of admission to intensive care units,[1–3] and is associated with increased risk for maternal and fetal adverse events.[4]

Preeclampsia is a metabolic disorder characterized by elevated blood pressure that develops after the 20th week of pregnancy associated with proteinuria of ≥0.3 g in a 24-hour urine collection. It leads to endothelial damage, platelet aggregation, activation of the coagulation system, increased vascular resistance and oxidative stress.[1,5–7]

Oxidative stress is defined as oxidation of macromolecules or other cell components resulting from increased levels of reactive oxygen and nitrogen species (RONS), and/or weakened antioxidant defenses, leading to cell damage. It plays a critical role in the pathogenesis of preeclampsia, as demonstrated by the presence of biomarkers of oxidative stress.[8]

Cells have various mechanisms to protect against oxidative stress and effective antioxidant defenses will prevent cell damage. Antioxidants are classified as enzymatic and nonenzymatic; the latter are also known as dietary antioxidants and include vitamins C, E and A, the trace elements zinc, selenium and copper, and phytochemicals such as flavonoids.[9]

It is not easy to determine individuals' diet, since eating habits are inseparable from symbolic aspects of social life and have a variety of meanings at all levels from the cultural environment to individual experiences, and it is therefore harder to perform an objective analysis of food habits by standard research methods. Nonetheless, dietary surveys are valuable tools for relating diet to health and disease.[10]

Considering that antioxidants reduce the levels of RONS associated with oxidative stress, which is a characteristic of preeclampsia, the objective of this study is to assess the intake of antioxidant nutrients and coefficients of variation (CVs) in a population of pregnant women with preeclampsia.

Methods

This was a case-control study carried out in 2014 in the public health network of the city of Maceió, Brazil, of pregnant women with preeclampsia referred to Professor Alberto Antunes University Hospital (HUPAA), the reference center for high-risk pregnancies in the state of Alagoas, and normotensive pregnant women attending prenatal consultations in primary health centers (PHCs) in the city. Those who were not resident in the city, bedridden, with neurological disorders, in serious condition or not being treated at HUPAA or in PHCs in Maceió, were excluded.

Sample size was calculated using Epi Info, version 7.0, based on a prevalence of preeclampsia of 17%,[11] for a 90% confidence level, 80% power and 1:1 ratio of exposed