Abstract

Introduction: Currently, most efforts to prevent nontransmissible chronic diseases at population level have centered on promoting healthy behaviors like physical activity, consumption of fruits and vegetables, and discouraging the consumption of tobacco and alcohol in the adult population, but the results have been less than hopeful. During recent years, a number of studies have indicated the relation between metabolic alterations and fetal growth with the development of nontransmissible chronic diseases in adult age. More recently, it has been proposed that maternal factors (endothelial function, oxidative stress, and alterations in adipokynes) and placental factors (mitochondrial dysfunction) are the precursory mechanisms of fetal metabolic alterations and of the later development of nontransmissible chronic diseases. Also, it has been suggested that possibly supplementation with micronutrients and physical exercise during pregnancy could regulate these maternal and placental factors. Aim: To conduct a literature review to verify the role of physical exercise and micronutrients during pregnancy on placental and maternal factors related to nontransmissible chronic diseases in adults. Methods: Medline, SciELO, Embase, Science Direct, Cochrane Central Register of Controlled Trials, and the Cochrane Library were used in the last 10 years (1998-2008). The following topics were reviewed: pregnancy, fetal development, oxidative stress, vascular endothelium, mitochondrial dysfunction, adipokynes, micronutrients, and exercise. Results: Oxidative stress, as the central pathophysiological event, such as changes in levels of adipokynes, mitochondrial and endothelial dysfunction, plays an important role in fetal programming of chronic diseases and factors such as micronutrient supplementation and physical exercise during pregnancy could modulate this state in a charity institution aiding in the early prevention of chronic diseases. Conclusion: To clarify whether the proposed molecular and physiological mechanism items are related to metabolic abnormalities and fetal complementation with micronutrients during pregnancy and/or regular physical exercise.

Keywords

Pregnancy, fetal development, oxidative stress, endothelial function, mitochondria, adipokynes, micronutrients, exercise.