Effect of maternal and paternal supplementation with antioxidant in pulmonary inflammatory process of the offspring of mice

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Abstract

Pregnancy is considered a period of increased susceptibility to infections due to the differential immunological conditions generated in fetal development. During pregnancy bacterial infections can lead to complications in the mother and the fetus, leading to early conceptions and abortion, being considered a serious maternal-child health and economic-social burden. Therefore, prophylactic and therapeutic interventions for infections that are not dangerous during pregnancy needs to be investigated. The maternal consumption of flavonoid naringenin during gestation does not show deleterious effects to the offspring and previous studies in the non-pregnant condition show an anti-inflammatory potential, in addition to its broad spectrum of action in metabolic syndromes. For this purpose, we will use a model of cervical and intrauterine inflammation induced by lipopolysaccharide during pregnancy of mice supplemented or not with naringenin (NAR). Additionally NAR supplementation, including breastfeeding, will investigate the effects of lung inflammatory response on offspring. Although most research focuses on the maternal importance on the immune system and health of offspring, recent researches has shown paternal influence. Among the mechanisms that may explain the paternal influence in the offspring are the MicroRNAs (miRNAs) of the semen. The miRNAS are small molecules of non-coding RNA, which regulate the expression of several genes and can be modified by dietary supplementation. Therefore, we will investigate the effect of maternal or paternal supplementation with NAR in the development of two clinically relevant respiratory syndromes during childhood: neutrophilic asthma and acute respiratory distress syndrome. The effect of maternal supplementation during pregnancy and/or breastfeeding on the development of both respiratory syndromes and the mechanisms responsible for the possible suppression of the inflammatory response will be evaluated. In parallel, we will analyze the effect of paternal NAR consumption prior to fertilization on the inflammatory response of the offspring and the changes in semen miRNAs. The present project is justified in understanding the effects of maternal and paternal supplementation on the development of inflammatory responses of the offspring, and may provide subsidies for the elaboration of prophylactic interventions.

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