Hippocampal Oxidative Stress and Behavioral Changes in Wistar Rat Dams Supplemented with Vitamin A
Schnorr, C.E.; Simões-Pires, A.; Bortolin, R.C.; Santos, J.P.A.; Behr, G.A.; Moreira, J.C.F.

Centro de Estudos em Estresse Oxidativo, Departamento de Bioquímica, UFRGS, Porto Alegre, RS, Brazil

INTRODUCTION: Vitamin A participates in the maintenance of normal hippocampal function during embryonic and postnatal stages of the vertebrate life. However, some central nervous system (CNS)-associated deleterious effects may be induced by vitamin A or by its metabolites. The transition to motherhood is a time of distinct neural and behavioral plasticity in the mother. Also, this is a time when a woman is vulnerable to the effects of stress and stress-related disorders. Recent studies estimate that during pregnancy and the postpartum period, 10–20% of women experience mood disorders such as depression and anxiety. Hippocampus, although not traditionally associated with the maternal circuit, has been implicated in maternal behaviors and is altered by motherhood. Thus, the aim of the present work was to investigate the effects of vitamin A supplementation in pregnant and nursing rats on maternal behavior and hippocampus redox parameters. MATERIAL AND METHODS: Wistar female rats (7 per group) were orally supplemented with retinyl palmitate (2500, 12,500 and 25,000 IU/kg/day) or saline (control) throughout pregnancy and nursing. Locomotory and exploratory behavior of the dams were observed in the open field test (OFT) at post-natal day (PND) 20. Redox parameters were evaluated in maternal hippocampus at PND21. Lipid peroxidation (thiobarbituric acid reactive species, TBARS), protein carbonylation, total thiol content and total reactive antioxidant potential (TRAP) and enzymatic activity of superoxide dismutase (SOD), catalase (CAT) and glutathione-S-transferase were determined in maternal hippocampus. RESULTS AND DISCUSSION: Supplementation with Vitamin A increased SOD/CAT ratio and induced oxidative damage in maternal hippocampus. Additionally, decreased locomotory and exploratory activity were observed in dams supplemented in gestation and nursing. CONCLUSION: Caution is suggested for vitamin A supplementation during pregnancy and breastfeeding, since oxidative stress can disturb several hippocampal functions and the behavioral alterations can also impairs essential behaviors for offspring care. Supported by: CNPq, IBN-net. Keywords: Free Radicals, Open Field, Retinoids.