In vivo effect of neopterin on oxidative stress and energy metabolism parameters in mouse brain

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Neopterin (Neo), an endogenous metabolite produced by dendritic cells and macrophages, is found at increased levels in cerebrospinal fluid of patients with brain inflammation and neurodegeneration. However, the role of this compound in these conditions is virtually unknown. Therefore, the objective of this investigation was to study the *in vivo* effect of Neo on oxidative stress and energy metabolism parameters, namely thiobarbituric acid-reactive substances (TBA-RS) and non-proteic sulfhydryl groups (NPSH) measurements, the activities of glutathione peroxidase (GPx), glutathione reductase (GR) and complexes I-IV of the respiratory chain in cerebral cortex of Swiss male mice. Animals of 30 days of life received intracerebroventricularly crescent doses of Neo (2.5 ?M and 25 ?M). Appropriate controls were done in parallel. Four hours after Neo administration, animals were killed and the cerebral cortex was dissected. The results demonstrated a significant reduction of TBA-RS measurement ($F_{(2,12)}$= 8.208; P< 0.05) and a protection in the NPSH cortical content ($F_{(2,12)}$= 5.339; P< 0.05) in Neo-treated animals. Moreover, Neo administration elicited a increase in GPx activity ($F_{(2,6)}$= 8.20; P<0.05); however, GR activity was not modified by the treatment. Finally, the activities of the respiratory chain complexes I to IV were not altered by Neo administration. These data indicate that Neo possesses antioxidative properties and could suggest that increased Neo levels in brain disorders might attenuates neuronal injury by scavenging oxygen free radicals and/or by inhibiting their generation.

Keywords: Neopterin, antioxidant effect, mice.