Adenosine A\textsubscript{2A} Receptor Blockade Attenuates Oxidative Stress and Toxicity in Rats Exposed to 3-Nitropropionic Acid

Bortolatto, C.F.\textsuperscript{1}; Wilhelm, E.A.\textsuperscript{2}; Jesse, C.R.\textsuperscript{3}; Nogueira, C.W.\textsuperscript{1}

\textsuperscript{1}Dep de Química, CCNE, UFSM, RS, Brazil, \textsuperscript{2}Centro de Ciências de Saúde, URI-Santiago, RS, Brazil, \textsuperscript{3}Curso de nutrição, UNIPAMPA - campus Itaqui, RS, Brazil

INTRODUCTION: Systemic administration of 3-nitropropionic acid (3-NP) in rats has been used as an experimental model of Huntington’s disease (HD), a progressive neurodegenerative disorder associated to impaired oxidative energy metabolism. The adenosine A\textsubscript{2A} receptors modulate many physiological and pathological processes in the brain. The objective of the present study was to investigate the protective effects of SCH58261, an adenosine A\textsubscript{2A} receptor antagonist, on oxidative stress and toxicity induced by 3-NP in rats. MATERIAL AND METHODS: Male Wistar rats were intraperitoneally (i.p.) treated with SCH58261 (0.01 or 0.05 mg/kg) or vehicle for 10 days. From 7\textsuperscript{th} to 10\textsuperscript{th} day, 3-NP (20 mg/kg/day, i.p.) or vehicle was injected 1 hour after SCH58261 administration. Twenty-four hours after the last 3-NP injection motor coordination (rotarod test), striatal succinate dehydrogenase (SDH) activity and parameters linked to striatal oxidative status were evaluated in rats. DISCUSSION AND RESULTS: SCH 58261 at the highest dose was effective against impairments on motor coordination induced by 3-NP. SCH 58261 was ineffective to restore the inhibition of SDH activity caused by 3-NP. In addition, the increase in striatal reactive species (RS) levels and depletion of reduced glutathione (GSH) content provoked by 3-NP injections was prevented by both doses of SCH 58261. The highest dose of SCH 58261 was also effective in protecting the increase of protein carbonyl levels as well as the inhibition of glutathione peroxidase (GPx) activity in rats exposed to 3-NP. Our results revealed that the reduction of oxidative stress in rat striatum by adenosine A\textsubscript{2A} receptor antagonism contributes for alleviating 3-NP-induced toxicity. CONCLUSION: In summary, our findings demonstrate that A\textsubscript{2A} receptor blockade by SCH 58261 attenuated striatal oxidative stress and signals of toxicity in rats exposed to 3-NP.

Palavra chave: adenosine receptor, 3-nitropropionic acid, oxidative stress
Patrocínio: CNPq and CAPES