The monocrotaline model of central nervous system damage in perspective.

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INTRODUCTION: Crotalaria plants are considered toxic and can cause damage to livestock and human health problems. Previously we demonstrated that both MCT from C. retusa and dehydromonocrotaline, its main active metabolite, induce changes in the levels and patterns of expression of the main protein from astrocyte cytoskeleton, glial fibrillary acidic protein (GFAP) and that glial cells metabolism are involved in MCT induced neurotoxicity. OBJECTIVES: This study investigated the toxic effects of monocrotoline on Central Nervous System of experimental intoxicated rats. MATERIAL AND METHODS: Twenty male adult Wistar rats (60 days old, weighing 250–300g) were randomly divided into 2 experimental groups (n = 8 animals in saline group and 12 animals in MCT group). The animals were administered by oral gastric gavage. Seventy-two hours after the MCT (109mg/Kg) treatment, the behavioral was assessed by Open field and Elevated Pluz Maze (EPM) tasks, and histopathological analysis and astrogliosis were assessed after perfusion and fixation of the brain with 4% paraformaldehyde and subsequent hematoxylin/eosin staining or immunocytochemistry for GFAP. DISCUSSION AND RESULTS: Our results demonstrated that MCT promotes a decreased in normal motor activity without any change in novelty habitation profile in rats submitted to open field task and anxiolytic-like effects in rats submitted to Elevated Pluz Maze (EPM). Moreover, histopathological analysis revealed hyperemic vascular structures in the hippocampus, parahippocampal cortex and neocortex, discreet perivascular edema in the neocortex, haemorrhagic focal area in the brain stem, and telangiectasia, with haemorrhage and edema in the thalamus. Furthermore immunohistochemical analysis revealed morphological changes on GFAP positive cells. CONCLUSION: We conclude that MCT ingestion induces neurotoxic effects on rats, characterized by behavioral changes, CNS vascular alterations and astrocytes response. MCT has been used as model of pulmonary hypertension, however elucidating its effects on CNS may brings this alkaloid as a model of CNS damages.

Keywords: Monocrotaline; Neurotoxicity; CNS model

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