Effect of *Achyrocline satureioides* (Marcela) Infusion on Neurotoxicity Parameters Induced by Hydrocortisone in Microglial Cells

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INTRODUCTION: Chronic exposure to cortisol can lead to excessive microglial activation, a key mechanism implicated in neurotoxic damage, potentially disrupting neuronal homeostasis and contributing to the onset of psychiatric disorders and neurodegenerative diseases. The search for plant-based compounds that act synergistically with existing drugs—enhancing therapeutic effects and/or reducing the required dose of the primary medication—may help minimize side effects and improve treatment tolerability. One such plant is *Achyrocline satureioides* (Lam.) DC, commonly known as marcela, native to the Pampa biome and widely used in traditional medicine as an herbal tea for gastrointestinal disorders, with calming and anti-inflammatory properties. **OBJECTIVE:** To evaluate the effect of marcela infusion on cortisol-induced microglial activation in BV-2 cells, through the assessment of cell viability and oxidative stress parameters. **MATERIALS AND METHODS:** BV-2 microglial cells were cultured under standard conditions and treated with marcela infusion at concentrations of 5, 100, and 300 µL/mL, concurrently exposed to a previously standardized hydrocortisone concentration (10 ng/mL). After 96 hours of exposure, cell viability was assessed via ATP quantification. Reactive oxygen species (ROS) production was evaluated using the DCFH-DA assay, and DNA oxidative damage was assessed by quantifying 8-hydroxy-2'-deoxyguanosine (8-OHdG) levels. Data were analyzed using GraphPad Prism 8.0. **RESULTS AND CONCLUSION:** Marcela infusion significantly increased cell viability even in the presence of cortisol. All tested concentrations effectively reduced ROS levels compared to the cortisol-only group. Additionally, 8-OHdG levels in marcela-treated cells were comparable to those of the control group, suggesting a protective effect against cortisol-induced genotoxicity. These findings indicate that *A. satureioides* infusion exerts a neuroprotective effect on activated microglia, possibly through antioxidant mechanisms and modulation of cell viability. Despite the limitations of the in vitro model, the results support the potential use of marcela as an adjuvant agent in contexts of neurotoxicity associated with chronic stress.

Keywords: Microglia, Hydrocortisone, Neuroinflammation