The Reversal Effect of \textit{m}-Trifluoromethyl diphenyl Diselenide on Tumor Necrosis Factor-\textgreek{a} (TNF-\textgreek{a})-induced Depressive-like Behavior in Mice

\textbf{Brüning, C.A.; Soares, S.M.; Martini, F.; Savegnago, L.; Nogueira, C.W.}

Laboratório de Síntese, Reatividade e Avaliação Farmacológica e Toxicológica de Organocalcogênios, Centro de Ciências Naturais e Exatas, Universidade Federal de Santa Maria, Santa Maria, CEP 97105-900, RS, Brazil.

\textbf{Introduction}: Systemic inflammation is known to cause a central neuroinflammation with activation of brain microglia. During the last five years, it has been established that pro-inflammatory cytokines, mainly interleukin-1\textgreek{b} (IL-1\textgreek{b}) and tumor necrosis factor-\textgreek{a} (TNF-\textgreek{a}), can induce major depressive disorders in physically ill patients with no previous history of mental disorders. \textit{m}-Trifluoromethyl-diphenyl diselenide (CF3) is an organoselenium compound that has been shown to elicit antidepressant-like effect in animal models. This study aimed to evaluate the effect of CF3 on TNF-\textgreek{a}-induced depressive-like behavior in mice. \textbf{Material and methods}: Male Swiss mice were injected i.c.v. with saline or TNF-\textgreek{a} (0.1fg-5 \textmu L/site) and after 30 min they received p.o. canola oil or CF3 (0.01–50 mg/kg) injection. After 30 min of oil or CF3 administration, the animals were submitted to the activity chamber and forced swimming test (FST), to evaluate the locomotor activity and depressive-like behavior, respectively. \textbf{Results and Discussion}: TNF-\textgreek{a} increased significantly the immobility time of animals in the FST, i.e., it induced a depressive-like behavior. CF3 demonstrated significant antidepressant-like effect \textit{per se} only at dose of 50 mg/kg and it reduced the immobility time increased by TNF-\textgreek{a} back to the control level from 0.1 mg/kg and at 50 mg/kg it decreased the immobility time below the control level. The total locomotor activity and the number of rearings recorded in the activity chamber were not altered by CF3 and/or TNF-\textgreek{a} administration, showing that the observed effects develop independently of locomotor performance impairments (two-way ANOVA/Newman-Keuls; p<0.05). \textbf{Conclusions}: The relationship between mood disorders and inflammatory processes can provide valuables targets for development of antidepressant drugs. In this way, CF3 had a protective effect at low doses in TNF-\textgreek{a}-induced depressive-like behavior in mice. Although more studies are necessary to understand the mechanisms behind this effect, CF3 might constitute a new drug for depression treatment.

Keywords: cytokines, depression, organoselenium

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