Uliginosin B, a natural phloroglucinol derivative with antidepressant-like activity, affects differently the activity of Na⁺,K⁺-ATPase in cerebral cortex and hippocampus of mice.

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Palavras Chave: uliginosin B; Na⁺,K⁺-ATPase; antidepressant-like activity; forced swimming test; tail suspension test.

Introduction: Uliginosin B (ULI) is a phloroglucinol isolated from Hypericum polyanthemum that presents antidepressant-like effect mediated by monoaminergic neurotransmission in rodents; it inhibits monoamines neuronal reuptake without binding to their neuronal carriers (Stein, et al., Behav Brain Res, 228, p.66, 2012) demonstrating that its mode of action differs from classical antidepressants. Studies have described the involvement of Na⁺,K⁺-ATPase brain activity in the depressive disorders (Goldstein et al., Dis Biol Psychiatry, 60, p. 491, 2006) and neuronal monoamine transport depends on Na⁺ gradient generated by Na⁺,K⁺-ATPase. Thus, the aim of this study was evaluate the effect of uliginosin B on the Na⁺,K⁺-ATPase activity in mice brain.

Experimental: ULI was isolated from H. polyanthemum by chromatographic methods (Stein, et al., Behav Brain Res, 228, p.66, 2012). Mice (n=8 per group) received uliginosin B single (10 mg/kg, p.o.) or repeated doses (10 mg/kg, p.o., once a day, 3 days) or vehicle (NaCl 0.9% + Tween 80 2%). Brain structures were removed 1 h or 3 h after last administration and Na⁺,K⁺-ATPase activity was based on inorganic phosphate release (Chan et al., Annal Biochem J., 220, p.375, 1986). Independent groups of mice were submitted to the same treatments and evaluated in the the tail suspension test (TST) and forced swimming test (FST).

Results/Discussion: Single administration of ULI increased Na⁺,K⁺-ATPase activity in cerebral cortex only at 1 h (Fig. 1A; 1B). Repeated administration produced an increase in Na⁺,K⁺-ATPase activity in cerebral cortex at 1 h (Fig. 2 A) and 3 h after the last administration (Fig. 2 B); the enzyme activity was not altered in the hippocampus in any time (Fig. 1C; 1D and Fig 2C; 2D) indicating a regional specificity. Single administration of ULI reduced the immobility in TST (Fig 3A) and FST (Fig 3B) only at 1 h whereas treatment for 3 days reduced it at both times (Fig 3C). Behavioral response are in line with biochemical results indicating that the effects of ULI are, at least in part, underlaid by its action on Na⁺,K⁺-ATPase.

Conclusion: Uliginosin B presents antidepressant-like effect in TST and FST that may be due to increase in cerebral cortex Na⁺,K⁺-ATPase activity.

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