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Antihypertensive potential of linalool and linalool complexed with β -cyclodextrin: effects of subchronic treatment on blood pressure and vascular reactivity

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Abstract: Linalool (LIN) is a monoterpene alcohol present in some aromatic medicinal plants with biological activities that can impact cardiovascular diseases. This chemical class is highly volatile and β -cyclodextrin (β -CD) has been employed to improve the pharmacological properties of monoterpenes. Thus, the aim of this study was to evaluate the cardiovascular effects of LIN free focusing on the antihypertensive properties of this monoterpene and to study whether LIN, complexed in β -cyclodextrin (LIN- β CD) is able to improve the pharmacological activity of LIN. Spontaneously hypertensive rats (SHR) were randomly divided into 5 groups, each treated daily for 21 days, in the following manner: group 1 (vehicle solution); group 2 (captopril; 30 mg/kg/day); group 3 (LIN; 100 mg/kg/day); group 4 (LIN; 50 mg/kg/day) and group 5 (LIN/ β -CD; 50 mg/kg/day). Daily body weight measurements were conducted and mean arterial pressure and heart rate were measured every 5 days. The mesenteric artery from treated animals was tested for phenylephrine and sodium nitroprusside (SNP) sensitivity. The SHR treated with vehicle demonstrated progressive increase in mean arterial pressure and captopril, a positive control, induced a significant decrease. After 21 days of treatment, the blood pressure of the SHR treated by (-)-LIN (100 mg/Kg) was significantly reduced. In addition, various important cardiovascular parameters improved, including: the treatment with LIN prevented the development of cardiac hypertrophy, increased levels of the anti-inflammatory cytokine (IL-10), increased vasodilator responsiveness and reduced sensitivity to the sympathetic agonist. Furthermore, the inclusion complex containing LIN in β -CD produced a higher antihypertensive profile when compared with uncomplexed form. Taking together, our results suggested that LIN shown a potential antihypertensive effect and β -CD may be an important tool to improve the cardiovascular activity of LIN and other water-insoluble compounds.

Keywords: linalool; antihypertensive; monoterpene; anti-inflammatory; vascular reactivity.

CATEGORY

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