

The effects of D-allose on locomotor activity and acetylcholinesterase activity in scopolamine-induced hyperactivity in mice

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A rare sugar, D-allose, is the C3-epimer of D-glucose present in small quantities in nature. It has received attention from many researchers because of its availability for mass production and its various physiological functions. Among these activities, it has become clear that D-allose has inhibitory effects on cancer cell proliferation and the production of reactive oxygen species as well as a protective effect against ischemia-reperfusion injury. In this study, we investigated whether D-allose is also applicable to the field of neurodegenerative diseases such as Parkinson's disease and Alzheimer's disease. In scopolamine-induced hyperactivity model, mice were received scopolamine 2 mg/kg once a day for 2 weeks. In the treatment group, mice were received D-allose 1 hr before scopolamine administration. Locomotors were determined by using activity apparatus and done after one week and two weeks of scopolamine injection. Mice were sacrificed and brain acetylcholinesterase (AChE) activity was evaluated at the day after locomotive experiment by spectrophotometer and using Ellman's method. Scopolamine treatment both one week and also 2 weeks significantly increased locomotor activity. In contrast, the D-Allose treatment group was no significantly difference in locomotor activity when compared with in the control group. AChE activity in the scopolamine-treated group was significantly increased as compared to the control group. Although, no significant difference was observed on the AChE activity profile between the control and D-Allose-treated mice, but AChE activity trended to be low in the D-Allose-treated group. These results indicated that the systemic administration of D-Allose can reduce hyperactivity induced by scopolamine. Hence, D-allose may become a new therapeutic candidate for treatment of neurodegenerative diseases.

Biography

Gomonchareonsiri Sumittra has completed her Ph.D. from Chulalongkorn University in Thailand and postdoctoral studies from Jefferson University in USA. She is the Instructor in the Department of Physiology at the Faculty of Medicine, Chiang Mai University in Thailand.

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