

Antidepressant-like effects of young green barley leaf (*Hordeum vulgare* L.) in the mouse forced swimming test

Katsunori Yamaura, Noriyuki Nakayama, Maki Shimada, Yuanyuan Bi, Hideki Fukata, Koichi Ueno

Department of Geriatric Pharmacology and Therapeutics, Graduate School of Pharmaceutical Sciences, Chiba University

ABSTRACT

Background Young green barley leaf is one of the richest sources of antioxidants and has been widely consumed for health management in Japan. In this study, we examined whether oral administration of young green barley leaf has an antidepressant effect on the forced swimming test in mice. **Materials and Methods** Mice were individually forced to swim in an open cylindrical container, one hour after oral administration of young green barley leaf (400 or 1000 mg / kg) or imipramine (100 mg / kg). Expression of mRNA for nerve growth factor (NGF), brain-derived neurotrophic factor, and glucocorticoid receptor in the brain was analyzed using real-time quantitative polymerase chain reaction (PCR). **Results** There was a significant antidepressant-like effect in the forced swimming test; both 400 and 1000 mg / kg young green barley leaves, as well as the positive control imipramine (100 mg / kg), reduced the immobility duration compared to the vehicle group. The expression of mRNA for NGF detected in the hippocampus immediately after the last swimming test was higher than that in the non-swimming group (Nil). Oral administration of imipramine suppressed this increase to the level of the Nil group. Young green barley leaf (400 and 1000 mg / kg) also showed a moderate decrease in the expression of mRNA for NGF, in a dose-dependent manner. **Conclusion** Oral administration of young green barley leaf is able to produce an antidepressant-like effect in the forced swimming test. Consequently it is possible that the antidepressant-like effects of the young green barley leaf are, at least in part, mediated by an inhibition of the increase in the hippocampus levels of NGF.

KEYWORDS

Antidepressant-like effect . corticosterone . forced swimming test . hippocampus . nerve growth factor . young green barley leaf

REFERENCES