

Germinated brown rice extract reduces brain lipid peroxidation and A β levels via regulations of BACE1, RAGE, IDE and LRP1 expressions in high fat/cholesterol diet-fed rats

ABSTRACT

A strong association presents between excessive amyloid- β (A β) buildup and oxidative stress with Alzheimer's disease (AD). In view of the multifaceted neuroprotective effects of some dietary elements, the beneficial effect of germinated brown rice was investigated using a high fat/cholesterol diet (HFCD)-induced sporadic rat model of AD. Seven groups, including normal control, HFCD, and HFCD treated with Donepezil, Simvastatin, Probucol, and germinated brown rice ethyl acetate extract (GBR-EA; 100 and 200 mg/kg bw) were included in the present study. Biochemical assays, brain lipid peroxidation, mRNA and protein levels involved in A β processing and metabolism pathways were analyzed. HFCD-fed rats exhibited increased brain lipid peroxidation and A β levels, as well as altered expressions of proteins involved in A β generation, degradation and clearance. GBR-EA treatment groups showed significant reduction in lipid peroxidation and A β levels when compared to HFCD group. The effects of GBR-EA on A β levels are likely through the modulation of BACE1 and Presenilins, as well as induction of A β clearance and degradation. The findings revealed the potential use of germinated brown rice to attenuate HFCD diet-induced neurodegenerative alterations, likely due to reduced brain inflammation, as well as modulation of A β processing and metabolism pathways.