

The hypocholesterolemic effect of germinated brown rice involves the upregulation of the apolipoprotein A1 and low-density lipoprotein receptor genes

ABSTRACT

Germinated brown rice (GBR) is rich in bioactive compounds, which confer GBR with many functional properties. Evidence of its hypocholesterolemic effects is emerging, but the exact mechanisms of action and bioactive compounds involved have not been fully documented. Using type 2 diabetic rats, we studied the effects of white rice, GBR, and brown rice (BR) on lipid profile and on the regulation of selected genes involved in cholesterol metabolism. Our results showed that the upregulation of apolipoprotein A1 and low-density lipoprotein receptor genes was involved in the hypocholesterolemic effects of GBR. Additionally, in vitro studies using HEPG2 cells showed that acylated sterol glycoside, gamma amino butyric acid, and oryzanol and phenolic extracts of GBR contribute to the nutrigenomic regulation of these genes. Transcriptional and nontranscriptional mechanisms are likely involved in the overall hypocholesterolemic effects of GBR suggesting that it may have an impact on the prevention and/or management of hypercholesterolemia due to a wide variety of metabolic perturbations. However, there is need to conduct long-term clinical trials to determine the clinical relevance of the hypocholesterolemic effects of GBR determined through animal studies.

Keyword: Germinated brown rice; Hypocholesterolemic; Apolipoprotein A1; Lipoprotein; Receptor upregulation