Antioxidant potential by arabinoxylan rice bran, MGN-3/biobran, represents a mechanism for its oncostatic effect against murine solid Ehrlich carcinoma.


Source

Department of Radiation Biology, National Center for Radiation Research and Technology, Cairo, Egypt. emnoaman@yahoo.com

Abstract

We have recently examined the oncolytic effect of arabinoxylan rice bran, MGN-3/biobran, against solid Ehrlich carcinoma (SEC)-bearing mice via immune-modulation and apoptosis [N.K. Badr El-din, E. Noaman, M. Ghoneum, In vivo tumor inhibitory effects of nutritional rice bran supplement MGN-3/biobran on Ehrlich carcinoma-bearing mice, Nutr. Cancer 60 (2) (2008) 235-244]. In the present study, we examined the antioxidant system as another possible mechanism through which MGN-3 exerts its oncostatic potential. Female albino mice were inoculated intramuscularly in the right thigh with Ehrlich ascites carcinoma (EAC) cells. MGN-3 (25 mg/kg body weight) was injected intraperitoneally (i.p.) six times a week for 25 days into mice at either day 4 or day 11 post-EAC cell inoculation. Tumor growth, lipid peroxidation (LPx), glutathione (GSH) contents, the activity of the antioxidant scavenger enzymes, and alterations in gene expression were examined. MGN-3 efficiently suppressed the growth of tumors, which was associated with normalization of the LPx levels and augmentation of GSH contents. MGN-3 enhanced the activity of the endogenous antioxidant scavenging enzymes -- superoxide dismutase (SOD), glutathione peroxidase (GPx), catalase (CAT) and glutathione-S-transferase (GST) -- in blood, liver, and tumor tissue. Similarly it up-regulated the expression of GPx, SOD1 and CAT mRNA in the liver. The effect of MGN-3 was more pronounced when treated early, at day 4 of tumor cell inoculation, as compared to later treatment at 11 days. In conclusion, MGN-3-induced oncostatic activity by modulating lipid peroxidation, augmenting the antioxidant defense system and protecting against oxidative stress.

PMID:18554778
In vivo tumor inhibitory effects of nutritional rice bran supplement MGN-3/Biobran on Ehrlich carcinoma-bearing mice.

Badr El-Din NK, Noaman E, Ghoneum M. 
Nutr Cancer. 2008;60(2):235-44.

Source

Department of Zoology, Faculty of Science, University of Mansoura, Mansoura, Egypt. na_ri_eg@yahoo.com

Abstract

This study was undertaken to investigate the in vivo anti-tumor activity of MGN-3/Biobran, a modified arabinoxylan rice bran. Swiss albino mice were inoculated intramuscularly in the right thigh with Ehrlich ascites carcinoma (EAC) cells. On Day 8, mice bearing a solid Ehrlich carcinoma (SEC) tumor were treated with MGN-3 via intraperitoneal injection. Tumor growth, cytokine production, and apoptotic effect of MGN-3 were examined. MGN-3 caused a highly significant delay in both tumor volume (63.27%) and tumor weight (45.2%) as compared to controls (P < 0.01). The mechanisms by which MGN-3 exerts its antitumor effect seem to involve its ability to induce apoptosis and immune modulation. MGN-3 induced a 1.8-fold increase in the percentage of apoptotic SEC cells as determined by flow cytometry and the histopathological examination. In addition, MGN-3 influenced plasma cytokine production by increasing the levels of tumor necrosis factor-alpha and interferon-gamma, while downregulating levels of the immune suppressing cytokine interleukin-10. Data also showed that non-tumor-bearing mice intramuscularly injected with MGN-3 resulted in a twofold increase in natural killer activity. No adverse side effects due to MGN-3 treatment were observed; all animals displayed normal feeding/drinking and life activity patterns. These data may have clinical implications for the treatment of solid cancers.

PMID: 18444156