Ganoderma lucidum. Efeito na carcinogênese, metástases e invasão do hepatoma humano: inibe MMP-9, ERK1/2, proteína kinase B, AP-1 e NF-kappaB.

Inhibitory effects of ganoderma lucidum on tumorigenesis and metastasis of human hepatoma cells in cells and animal models.


Source

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Abstract

Metastasis is considered to be the major cause of death in patients with cancers, and hepatocellular carcinoma (HCC) is a highly metastatic cancer. Ganoderma lucidum, a well-known mushroom with various biological effects, is a functional food known to contain lucidenic acid. The objectives of this study were to investigate the anti-invasion effect of a lucidenic acid-rich G. lucidum extract (GLE) on human hepatoma HepG2 cells as well as the antiproliferative and antimetastatic effects of GLE in human hepatoma cells implanted into ICR-nu/nu mice. Phorbol-12-myristate-13-acetate (PMA)-induced invasion and matrix metalloproteinase (MMP)-9 expression levels of HepG2 cells were reduced by GLE treatment in a dose-dependent manner. The inhibitory effects of GLE on MMP-9 expression proceeded by inhibiting the phosphorylation of extracellular signal-regulated kinase (ERK1/2) and protein kinase B in the cytosol as well as reducing activator protein-1 and nuclear factor-kappa B levels in the nucleus of HepG2 cells. In a human tumor xenograft model, a dose-response inhibition was observed in the average size, volume, and weight of tumors upon oral administration of GLE. The number of metastatic tumor-bearing mice, the number of affected organs, and the number of tumor foci as well as the MMP-2 and -9 activities in serum of mice were also significantly suppressed by oral administration of GLE. These results suggest that the lucidenic acid-rich GLE could serve as a chemopreventive agent for the tumorigenesis and metastasis of highly invasive hepatoma cells.

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