

The Chemosensitizing and Radiosensitizing Effect of COX Inhibitors on Gliomas

D.H. Lee, B.M. Kim and S.H. Hong

*Korea Institute of Radiological & Medical Sciences, 215-4 Gongneung-dong, Nowon-ku, 139-706 Seoul, Republic of Korea**gobrian@kcch.re.kr*

Many of cyclooxygenase (COX) inhibitors, the non-steroidal anti-inflammatory drugs (NSAIDs) are known to be used for the treatment and prevention of various human cancers. The chemosensitizing and radiosensitizing effect of COX inhibitors on the treatment of gliomas are investigated in this study. Using the colorimetric MTT [3-(4, 5-dimethyl-2-thiazolyl)-2, 5-diphenyl-2H tetrazolium bromide] assay, the combination effect of COX inhibitors with other anti-cancer agents on the survival of gliomas was evaluated. The combined use of COX inhibitors (celecoxib, mefenamic acid, nimesulide) with ceramides (phytosphingosine, N-acetyl phytosphingosine, N,N-dimethyl phytosphingosine) increased the cytotoxicity of human U87MG, U251MG and U373MG glioma cells, resulted in synergistic growth inhibition of these cell lines. Also, using colony forming assay, the radiosensitizing effect of COX inhibitors on glioma cell lines was tested. The treatment of COX inhibitors prior to ionizing radiation increased the cytotoxic effect of radiation on the glioma cell lines tested. The combination of COX-2 inhibitors with radiation or anti-cancer drugs may increase the therapeutic effects in the cancer treatment, and may reduce the side effects induced by radiation or anti-cancer agents.