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THE EFFECT OF USNIC ACID ON BREAST CANCER

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ABSTRACT

Breast cancer is the most common type of cancer among women world wide. The inflammatory responses necessary for enabling an immune reaction may also set the stage for promoting neoplastic disease. It has been reported that cancer is associated with inflammation. Inflammation is known to cause increase of cancer cells. Usnic acid (UA), a secondary metabolite, is mainly derived from certain lichen species. Growing evidence suggests that UA has anti-tumor, anti-oxidative, anti-inflammatory, and other activities in a variety of cancer cells. However,the effect of UA on anti-inflammatory mechanism in breast cancer is unclear. We aimed to display the anti-inflammatory effects of UA via measuring prostaglandin E2 (PGE2) and nitricoxide (NO) levels and cyclooxygenase-2 (COX-2) and inducible nitricoxide synthase (iNOS) gene expression in MCF-7 cell line. MCF-7 human breast cancer cells were purchased from Institution Foot and Mouth Disease Institute-ANKARA (TURKEY). Dose of UA was determined with xCELLigence DP system (ACEA Biosciences). Total RNA was extracted by a RNeasy Plus Mini Kit (Roche) according to the manufacturer's instructions, quantified with a spectrophotometer (NanoDrop ND-1000; ThermoScientific, Wilmington, DE), and stored at -80°C before use. TaqMan gene expression assays used for this study were: iNOS and COX-2. PGE_2 and NO levels were measured by using ELISA kit (MyBioSource) according to manufacturer's instructions. Our study has shown that applied UA dose s significantly decreased NO, PGE_2 levels and iNOS, COX-2 gene expression in MCF-7 cell line. Inhibition of NO and PGE_2 production by UA is a result of the inhibition of iNOS and COX-2 gene expression. For this reason, it is possible to say that UA can be used to reduce the inflammatory response in breast cancer.

Keyword: Usnic Asid, MCF-7 cell line, Breast cancer, COX-2, iNOS