Impact of reactive oxygen species on the expression of adhesion molecules in vivo.

Abstract:
Many non-surgical tumor treatments induce reactive oxygen species (ROS) which result in cell damage. This study investigated the impact of ROS induction on the expression of adhesion molecules and whether alpha-tocopherol pre-treatment could have a protective effect. Experimental rat DS-sarcomas were treated with a combination of localized 44 degrees C-hyperthermia, inspiratory hyperoxia and xanthine oxidase which together lead to a pronounced ROS induction. Further animals were pre-treated with alpha-tocopherol. The in vivo expression of E- and N-cadherin, alpha-catenin, integrins alpha v, beta 3 and beta 5 as well as of the integrin dimer alpha v beta 3 was assessed by flow cytometry. The expression of alpha v-, beta 3-integrin, of the alpha v beta 3-integrin dimer and of E-cadherin was significantly reduced by the ROS-inducing treatment. This effect was partially reversible by alpha-tocopherol, indicating that ROS play a role in this process. N-cadherin, alpha-catenin and beta 5-integrin expression were unaffected by ROS. These results indicate that the expression of several adhesion molecules is markedly reduced by ROS and may result in a decrease in the structural stability of tumor tissue. Further studies are needed to clarify the impact of ROS induction on the metastatic behavior of tumors.