عنوان مقاله:

Vitamin E Pretreatment of Mesenchymal Stem Cells: The Interplay of Oxidative Stress and Inflammation

محل انتشار:

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خلاصه مقاله:

Oxidative stress occurs as a result of breaking down the balance between oxidants (e.g., reactive oxygen species (ROS)) and antioxidants in cells. Several studies have shown that there is a close relationship between oxidative stress and inflammation at the sites of injury. Mesenchymal stem cells (MSCs) are exposed to endogenous and exogenous oxidants generated during their ex vivo expansion or following in vivo transplantation. α-tocopherol (vitamin E) is a fat-soluble compound known for its anti-oxidant and anti-inflammatory properties. In many studies, the immunomodulatory effects of vitamin E have been observed in vivo. This study aimed to determine whether pretreatment of MSCs with antioxidants like vitamin E, will enhance the anti-inflammatory and immunomodulatory properties of these cells. For this purpose, adipose-derived MSCs (ASCs) were treated with vitamin E (۶۰۰ μM) for ۴۸ h. Quantitative PCR (qPCR) experiments were performed to evaluate the expression of genes related to inflammation (IL-۱β, IL-۶, IL-۱۷, IL-۱۰) or immunomodulation (TSG-۶, COX-۲, TDO۲, TGF-β۱). Results indicated that vitamin E significantly increased the expression of COX-۲, TSG-۶, and IL-۱β genes at the mRNA level compared with the control group, while it significantly decreased IL-۶ and TGF-β expressions. No effect was observed for IL-۱۷, IL-۱۰, and TDO۲ genes. These results suggest that in vitro preconditioning of ASCs with vitamin E may allow the cells to improve their anti-inflammatory and immunoregulatory capacities. Vitamin E pretreatment could lead to the improvement of their

.therapeutic abilities in conditions that are influenced by oxidative stress

کلمات کلیدی:

Immunology, Mesenchymal Stem Cells, English, vitamin E, Immunomodulation, oxidative stress, Preconditioning