World Academy of Science, Engineering and Technology
International Journal of Nutrition and Food Engineering
Vol:9, No:06, 2015

Effects of Hydroxysafflor Yellow a (HSYA) on UVA-Induced Damage in HaCaT Keratinocytes

Authors : Szu-Chieh Yu, Pei-Chin Chiand, Chih-Yi Lin, Yi-Wen Chien

Abstract : UV radiation from sunlight cause numbers of acute and chronic skin damage which can result in inflammation, immune changes, physical changes and DNA damage that facilitates skin aging and the development of skin carcinogenesis. Reactive oxygen species (ROS) are generated by excessive solar UV radiation, resulting in oxidative damage to cellar components, proteins, lipids, and nucleic acids. Thus, antioxidation plays an important role that protects skin against ROS-induced injury. Safflower (Carthamus tinctorius L.) is an important Chinese medicine contained abundance flavones and hydroxysafflor yellow A (HSYA) which is main active ingredient. HSYA is part of quinochalcone and has unique structures of hydroxy groups that provided the antioxidant effect. In this study, the aim was to investigate the protective role of HYSA in human keratinocytes (HaCaT) against UVA-induced oxidative damage and the possible mechanism. The HaCaT cells were UVA-irradiated and the effects of HYSA on cell viability, reactive oxygen species generation, DNA fragmentation and lipid peroxidation were measured. The mRNA expression of matrix metalloproteinase I (MMP I), cyclooxygenase-2 (COX-2) were determined by RT-PCR. In this study, UVA exposure lead to decrease in cell viability and increase in reactive oxygen species generation in HaCaT cells. HYSA could effectively increase the viability of HaCaT cells after UVA exposure and protect them from UVA-induced oxidative stress. Moreover, HYSA can reduce inflammation through inhibition the mRNA expression of MMP I and COX-2. Our results suggest that HSYA can act as a free radical scavenger while keratinocytes were photodamaged. HYSA could be a useful natural medicine for the protection of epidermal cells from UVA-induced damage and will be developed into products for skin care.

Keywords : HaCaT keratinocytes, hydroxysafflor yellow A (HSYA), MMP I, oxidative stress
Conference Title : ICFSN 2015 : International Conference on Food Science and Nutrition
Conference Location : London, United Kingdom
Conference Dates : June 28-29, 2015