



Senolytic effects of berberine protects fibroblasts cells against UV induced ageing

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The gradual and irreversible pathophysiological process of ageing escalates many chronic diseases which may lead to disability and ultimately death in elderly individuals. Premature ageing is largely associated with DNA damages similar to the ones associated with UV-induced photoaging and the protective effects of phytochemicals as inhibitors of cellular senescence is an area of increased research significance. In the present study, we tried to determine the UV protective and senolytic effects of berberine in experimental ageing models. L929 cells were subjected to UV treated and treated with different concentrations of berberine from 3.1 to 25 $\mu\text{g}\cdot\text{mL}^{-1}$. The effect of berberine on intracellular reactive oxygen species (ROS) generation was determined by 2'-7'-dichlorodihydrofluorescein diacetate (DCFDA) staining. The DNA damages were measured by comet assay and senescence was determined using galactosidase staining. The methylthiazolyldiphenyl-tetrazolium bromide (MTT) results confirmed the berberine-associated protection in L929 cells with significant improvement in cellular morphology. UV exposure significantly increased ROS generation and was decreased in groups co-treated with berberine. UV irradiation resulted in increased tail length whereas co-treatment with berberine significantly reduced DNA damage. X gal staining confirmed the senolytic effects of berberine. The experimental findings confirm that berberine can limit the oxidative injury and DNA damages produced by UV rays which inturn find applications in limiting ageing and associated metabolic diseases.

Keywords: Comet assay, DNA damage, Photoaging, Photochemoprotection, Radiation, Reactive oxygen species (ROS), Senescence, Ultraviolet rays