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ABSTRACT BOOK

PP210. Oleuropein treatment attenuates ROS generation, inflammation, and H2O2-induced damage in human trophoblast cells

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Higher energy demands during pregnancy lead to enhanced oxidative phosphorylation and increased production of reactive oxygen species (ROS) which have been shown to act as important regulators of angiogenesis, proliferation, differentiation and invasion of placental cells - trophoblast, autophagy and other important physiological processes and tissue adaptations. This controlled placental oxidative stress and inflammatory response are essential for successful early pregnancy. However, unbalanced, excessive ROS production has adverse effects on pregnancy outcome, causing trophoblast cell damage and dysfunction. Antioxidant supplements have been proposed as a possible approach in the prevention and treatment of such disorders. Secoiridoid oleuropein (OLE) is the most abundant phenolic compound found in olive leaves and drupes and has been shown to display profound antioxidant and anti-inflammatory activities. Its effects on trophoblast cells remain unexplored. The aim of our study was to investigate the impact of OLE on HTR-8/SVneo extravillous trophoblast cell line against hydrogen peroxide (H2O2)-induced oxidative damage. Results have shown that treatment with OLE at selected concentrations (10 and 100 μM) for 24h prevented a decrease in cell viability compromised by H2O2. Levels of lipid peroxidation indicators (MDA and LDH) were markedly reduced, and protein carbonylation and nitrosilation were significantly attenuated in trophoblast cells treated with OLE compared to untreated control cells. Further, OLE treatment decreased intracellular ROS production at both concentrations and significantly reduced the activity of antioxidant enzymes catalase, glutathione peroxidase and superoxide dismutase as well as restored glutathione levels in H2O2-exposed HTR-8/SVneo cells. OLE reduced the protein expression of inflammatory factor iNOS and decreased mRNA expression of pro-inflammatory cytokines IL-6 and TNFα in H2O2-treated cells. Our results indicate that OLE may ameliorate cellular oxidative damage, reduce inflammation and increase cellular antioxidant capacity in human trophoblast cells. It should also be emphasized that this olive-derived bioactive compound per se did not lead to any adverse effects in HTR-8/SVneo trophoblast cells under the described conditions, confirming its safety in vitro.