PROTECTIVE ROLE OF *N-TRANS*-FERULOYLTYRAMINE IN HYDROGEN PEROXIDE-INDUCED CELL DEATH

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ABSTRACT

Reactive oxygen species (ROS) are constantly produced by mitochondrial respiration under physiological conditions. Cells use the antioxidant enzyme system to scavenge ROS and prevent cellular damage and apoptosis. In many disease conditions such as Alzheimer's disease and Parkinson's disease, overproduction of ROS overwhelms cellular antioxidant capacity, and oxidative stress plays a pivotal role in the pathophysiology of those diseases. *N-trans*-feruloyltyramine (NTF), a plant-derived chemical, purified from a local medicinal tree called *Polyalthia suberosa*, possesses an antioxidant property that could decrease ROS. A recent study has concluded that NTF can effectively protect the auto-oxidation of linoleic acid. This study, therefore, aimed to evaluate the antioxidant effects of NTF in an *in vitro* cell model (SK-N-SH cells), induced with H_2O_2, and whether the reduction of the ROS level can lead to cytoprotection in our model. We investigated the protective effect of NTF by assessing cell viability using MTT assay, ROS level, and cell morphology. Apoptotic cell death was demonstrated by the level of the pro-apoptotic protein Bax, activated caspase-3, and the activity of caspase-3. Challenging SK-N-SH cells with 150µM of H_2O_2 increased the ROS level, induced cytotoxic changes, and decreased cell viability whereas preincubation with various concentrations of NTF in our model significantly reduced cellular ROS, attenuated cytotoxic cell death, level of Bax, and activated caspase-3. H_2O_2-induced increase in caspase-3 activity was also preventable by NTF pretreatment. According to these findings, NTF can significantly reduce cellular ROS and protect against H_2O_2 -mediated cytotoxicity and cell death in SK-N-SH cells.

KEY WORDS: *N-TRANS*-FERULOYLTYRAMINE/ANTIOXIDANT/APOPTOSIS/ REACTIVE OXYGEN SPECIES/ SK-N-SH CELLS

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