

Abstract

Introduction: Acrylamide (AA) is a water-soluble toxic chemical that is considered one of the most important food contaminants. Furthermore, AA is considered a major public health risk. This study was designed to evaluate the effects of AA on the cytotoxicity, oxidative damage and genotoxicity in human lymphocytes and also to evaluate protective effects of the chrysin (CH).

Materials and methods: Lymphocytes after isolation from the blood were treated with AA (50 μ M), AA (50 μ M) plus CH (10, 25, 50 μ M) and CH (50 μ M), and parameters such as cell viability, mitochondrial and lysosomal damage, and also oxidative damage to DNA were examined.

Results: The results showed that CH was able to reduce cytotoxicity, reactive oxygen species (ROS) levels, lipid peroxidation (LPO) level, collapse in mitochondrial membrane potential (MMP) and oxidative damage of DNA caused by AA in human lymphocytes. Also, co-treatment of the AA-exposed human lymphocytes with CH increases the glutathione (GSH) levels. Results suggest that CH (10, 25, 50 μ M) show a protective role in AA-induced cytotoxicity, oxidative stress, mitochondrial damage and DNA oxidative damage.

Conclusion: Based on the results, it can be acknowledged that CH can be a potent protective agent against the adverse effects of AA and can reduce cytotoxicity, MMP and oxidative DNA damage and increase GSH levels.

Keywords: Acrylamide; Chrysin; Oxidative Stress; Mitochondria; Cytotoxicity