

Evaluation of the cytotoxicity of Amaranth extract on human hepatocytes cell line

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Abstract

Background: In the history of many people who referred to Kerman medical centers with acute liver failure, a history of Amaranth plant consumption was reported. This study aimed to evaluate the cytotoxicity of Amaranth extract on human hepatocytes cell line in Afzalipour hospital.

Materials and Methods: In this experimental study, the Amaranth extract was prepared by Faculty of Persian Medicine, Kerman University of medical sciences. Hepatocytes were obtained from research center for hydatid diseases, Afzalipour hospital. Cells were grown in Dulbecco's Modified Eagle's Medium with 10% (v/v) heat-inactivated fetal bovine serum, penicillin and streptomycin with 95% humidity at 37 °C in an atmosphere of 5% CO₂. The culture media were replaced with fresh media in three days later and then every two days. After a few weeks of passage and after making sure that the cells came out of stress and returned to regular conditions, the percentage of cell growth and reproduction of Amaranth extract was measured using cell survival tests including MTT assay and Neutral red.

Results: In MTT assay, in different stages by increasing the dose of Amaranth plant and evaluating the average light absorption as mitochondrial activity, percentage of live hepatocytes in culture medium containing 200 µg/ml Amaranth extract was significantly reduced to less than half. In the Neutral red, by examining the average light absorption of colored cations as the rate of lysosome absorption and cell membrane health, showed that culture media containing 100 and 200 µg/ml of Amaranth extract had cytotoxicity effects and reduces the survival of hepatocytes.

Conclusion: Considering the toxicity effects of Amaranth plant by reducing cell survival and Induced Hyperbilirubinemia and acute liver failure, it should be noted that in addition to the benefits and positive effects of this plant, its hepatotoxicity effects should also be considered. Intractable consumption of this plant should be limited.

Keywords: Amaranthus, Cytotoxicity, Hepatocytes