A search for hepatoprotective activity of aqueous extract of Cucurbita moschata in isolated rat hepatocytes

R. Shayesteh¹,*, M. Kamalinejad², E. Mostafavi¹, M.R. Eskandari¹

¹Department of Pharmacology and Toxicology, School of Pharmacy, Zanjan University of Medical Sciences, Zanjan, Iran
²Faculty of Pharmacy, Shaheed Beheshti University of Medical Sciences, Tehran, P.O. Box 14155-6153, Iran

Background and Aims: The fruit of Cucurbita moschata has been widely accepted as a dietary constituent in different areas of the world. It was shown that Cucurbita moschata has antioxidative activity. It has been also reported that this fruit is an important source of provitamin A. Due to antioxidant and free radical scavenging activities of Cucurbita moschata, we planned to study liver protective (hepatoprotective) effect of aqueous extract of Cucurbita moschata fruit against cytotoxicity and reactive oxygen species (ROS) production, using accelerated cytotoxicity mechanisms screening (ACMS) techniques in isolated Sprague–Dawley rat hepatocytes as a cellular model. These cells are the most similar mammalian cells to human liver hepatocytes.

Method: Fresh fruits of Cucurbita moschata were cleaned, and then dried in shade at room temperature and aqueous extract of Cucurbita moschata was obtained. Hepatocytes were obtained by collagenase perfusion of the liver and viability was assessed by plasma membrane disruption determined by trypan blue (0.2 w/ v) exclusion test. To determine the rate of hepatocyte reactive oxygen species (ROS) generation induced by cumene hydroperoxide, dichlorofluorescin diacetate (DCFH-DA) was added to the hepatocytes. The latter then reacts with ROS to form the highly fluorescent dichlorofluorescein (DCF), which effluxes the cell. The fluorescence intensity of DCF was measured.

Results: In the current study, the antioxidant activity of Cucurbita moschata was evaluated in isolated rat hepatocytes and we tried to figure out whether Cucurbita moschata could protect hepatocytes against cumene hydroperoxide (CHP) induced-cytotoxicity and ROS formation. Aqueous extract of Cucurbita moschata fruit prevented CHP induced hepatocyte membrane lysis as well as ROS formation.

Conclusions: These findings demonstrated that Cucurbita moschata extract acts as a hepatoprotective and antioxidant agent against CHP-induced hepatotoxicity. It was concluded that Cucurbita moschata can be considered a potential candidate to protect the liver against the deleterious effect of oxidative stress.