The Fourth International Clinical Oncology Congress

ISRO Iranian Society of Radiation Oncology

EVALUATING VIABILITY OFHUMAN ESOPHAGEAL CARCINOMA CELLS UPON UROLITHIN TREATMENT AND HEAT SHOCK INDUCTION

Sara Mirzaei[1], Maryam M. Matin[1,2,3*], Fatemeh B. Rassouli[1,2*], Milad Iranshahy[4], Hamid Gholamhosseinian[5]

1. Department of Biology, Faculty of Science, Ferdowsi University of Mashhad, Mashhad, Iran.
2. Novel Diagnostics and Therapeutics Research Group, Institute of Biotechnology, Ferdowsi University of Mashhad, Mashhad, Iran.
3. Stem Cell and Regenerative Medicine Research Group, Iranian Academic Center for Education, Culture and Research (ACECR), Khorasan Razavi Branch, Mashhad, Iran.
4. Biotechnology Research Center, Pharmaceutical Technology Institute, Mashhad University of Medical Sciences, Mashhad, Iran.
5. Department of Medical Physics, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran.

matin@um.ac.ir; behnam3260@um.ac.ir

Background and objective: Esophageal squamous cell carcinoma (ESCC) is a lethal cancer that arises from malignant transformation of cells lining the esophagus. Urolithins are ellagic acid metabolites with wide pharmacological properties such as chemopreventive, anticancer and anti-inflammatory activities. The goal of this study was to investigate whether pretreatment of esophageal carcinoma cells with urolithins could affect heat shock response.

Methods: Urolithin A, methylated urolithin A and urilithin B (UA, mUA and UB, respectively) were synthesized by a reaction between 2-bromo-5-methoxybenzoic acid and resorcinol. KYSE30 cells, an ESCC cell line, were pretreated with 20 µM of UA, mUA and UB for 48 h. For heat shock induction, cells were incubated at 51 °C for 30 min, followed by 24 h recovery. To note, cells treated with 0.2% DMSO + heat shock were considered as control treatment. Then, viability of cells was determined by resazurin as a colorimetric assay, and mechanism of cell death was elucidated using annexin V-PI flowed by flow cytometry analysis.

Results: Our findings indicated that 48 h after treatment of cells with 20 µM UA and heat shock induction, 57% of cells were alive. However, percentage of viable cells were calculated as 62% and 69% upon 48 h pretreatment with 20 µM mUA and 20 µM UB followed by heat shock induction, respectively. Detection of cell death by flow cytometry confirmed viability assessment, as considerable increase in the percentage of early and late apoptotic cells was observed upon 20 µM UA + heat shock treatment.

Conclusion: Due observed activities of UA in present research, this agent has the potential to be used in future studies on other ESCC cell lines and/or in combination with more therapeutic modalities such as radiotherapy.

Keywords: Esophageal carcinoma, Urolithin A, Heat shock, Viability assessment, Apoptosis detection.