Research in Pharmaceutical Sciences, 2012;7(5)
School of Pharmacy and Pharmaceutical Sciences
Isfahan University of Medical Sciences
Proceeding of 13th Iranian Pharmaceutical Sciences Congress

Evaluation of anti-cancer activity of two new biuret derivatives against T47D and K562 cell lines in the presence of natural killer cells

A. Savarizadeh[1,*], N. Adibpour[2], A. Khodadadi[3], S. Rezaee[4], M. Asariyan[5]

[1]Department of Chemistry, Science and Research Branch, Islamic Azad University, Khozestan, Iran
[2]Department of Medicinal Chemistry, School of Pharmacy, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
[3]Department of Immunology, School of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
[4]Department of Pharmaceutics, School of Pharmacy, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran
[5]School of Pharmacy, Ahvaz Jondishapur Unversity of Medical Sciences, Ahvaz, Iran

Background and Aims: Different approaches such as synthesis of potent compound, finding natural product with fewer side effects or using antiproliferative effects of natural killer (NK) cells are considered for better treatment of cancers. In this study, the use of NK cells along with several biuret derivatives which have been reported as cytotoxic agents against T47D cancer cell lines was considered to assess the possibility of enhancing their cytotoxicity.
Methods: Biurets were prepared from the reaction of allophanates with aniline derivatives. To assess cytotoxicity, different number of NK cells, which extracted from whole blood, were added to various concentrations of the tested biurets and cancer cells (T47D and K562) in 96 well plates. Cytotoxicity was measured by lactate dehydrogenase (LDH) assay kit. Results were compared to those wells that contain biurets or NK cells alone with cancer cells. Analysis of covariance was used to analyze the effect of biuret concentration and number of added natural killer cells to each well on the observed cytotoxic activity.
Results: For 1-(3-phenylpropyl)-5-(quinaldin-4-yl) biuret, presence of NK cells (50000 in each well) led to a significant increase (average of 12%) in the cytotoxic activity on T47D ($p<0.0001$). Cytotoxic effect of this compound against K562 cancer cells in the presence of the same number of natural NK cells, showed an average decrease of about 7% ($p=0.0001$). 1-(2-phenylethyl)-5-(quinaldin-4-yl) biuret showed significantly increased cytotoxicity (10%) on T47D cell line ($p=0.0002$).However, presence of NK cells resulted in 7-17% decrease of cytotoxicity on K562 which was significant at number of NK cells of 80 ($p=0.0203$).
Conclusions: Results show that NK cells could enhance the cytotoxic action of the tested biurets on T47D cell. However, it seems that presence of NK cells might lead to a decrease in cytotoxicity of these biurets against the K562 cell line.

Keywords: Cytotoxicity; Biurets; NK cell; K562; T47D