Research in Pharmaceutical Sciences, 2012;7(5)
School of Pharmacy and Pharmaceutical Sciences
Isfahan University of Medical Sciences

Synthesis and antibacterial, antifungal and cytotoxic evaluation of some new 2,3-disubstituted 4(3H)-quinazolinone derivatives

M. Rahmani Khajouei[1,*], G. Khodarahmi[1], F. Hassanzadeh[1], G. Hakimelahi[1], D. Abedi[2]

[1]Department of Medicinal Chemistry, School of Pharmacy and Pharmaceutical Science, Isfahan University of Medical Sciences, Isfahan, Iran.
[2]Department of Biotechnology, School of Pharmacy and Pharmaceutical Science, Isfahan University of Medical Sciences, Isfahan, Iran.

Background and Aims: The present study was designed to discover new antimicrobial and cytotoxic agants with quinazolinone structure. Quinazolinones are a group of fused heterocyclic compounds which have valuable biological properties including antibacterial, antifungal, and cytotoxic activities. In the present study 15 new quinazolinones were synthesized and were evaluated for their biological activities.
Methods: The target compounds were synthesised by a six steps procedure using anthranilic acid. The antibacterial and antifungal activities of the synthesized compounds were studied by Microplate Alamar Blue Assay (MABA) against six strains of bacteria and three strains of fungi. Also Minimum Bactericidal Concentration (MBC) and Minimum Fungicidal Concentration (MFC) tests were performed. The cytotoxic effects of compounds against HeLa cells were evaluated using colorimetric MTT assay.
Results: The structure of compounds were confirmed by IR, 1HNMR and Mass spectra. All synthesized compounds indicated mild antibacterial effects especially against Gram-negative bacteria. All strains of tested fungi were sensitive to the synthesized compounds mostly at 32 µg/ml and there were no significant differences in the sensitivity of the tested compounds. While the synthesized compounds did not show significant cytotoxic activities, compounds 7a3 and 7a4 reduced cell viability to about 50% at 100 µM concentration.
Conclusions: In this work, quinazolinones as biologically active substances were conjugated with another well known moiety (phenyl hydrazine) in a multi step reaction procedure to produce interesting novel hydrazide derivatives of quinazolinone. According to the biological evaluations, tested compounds showed no significant cytotoxic effects while they possess good antifungal activities. The lack of high cytotoxicity could be beneficial as potential antifungal agents should have no toxicity on human cells.The synthesized compounds could be considered as valuable templates for further modification to design more potent antifungal agents by the addition of different heterocyclic groups such as imidazole and triazole to the quinazolinone structure.

Keywords: 4(3H)-Quinazolinone; Antibacterial; Antifungal; Cytotoxicity