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

Design, synthesis and anticholinesterase activity of a novel series of 2-amino-4-benzylpiridinium-5-oxo-4,5-dihydropyrano[3,2-C]chromene-3-carbonitrile derivatives

L. Jalili-Baleh[1,*], M. Alipour[2], M. Khoobi[3], A. Shafiee[1]

[1]Department of Medicinal Chemistry, Faculty of Pharmacy and Pharmaceutical Sciences Research Center, Tehran University of Medical Sciences, Tehran, Iran
[2]School of Chemistry, University College of Science, University of Tehran, Tehran, , Iran
[3]Pharmaceutical Sciences Research Center, Tehran University of Medical Sciences, Tehran, Iran

Background and Aims: Alzheimer's disease (AD) is considered as a common neurodegenerative disorder mostly observed in aged populations. It has been reported that around 10% of the world's population is bothered by AD. Decrease of acetylcholine level in the hippocampus and cortex is the one of the most important causes of AD, therefore some of acetylcholinesterase (AChE) inhibitors are effective agents for treatment of AD's symptoms. The synthesis and evaluation of AChE inhibitors have been largely described. In our study, we have focused on designing compounds with potential ability of interaction towards both binding sites on AChE. In an attempt to find novel agents against AD, a series of dihydropyranochromene derivatives have been reported as compounds able to inhibit acetylcholinesterase enzyme.
Methods: The synthetic pathway for synthesis of our designed compounds is shown in 2 steps (1) 4-Hydroxychoumarin (1 equiv), Malunonitrile (1 equiv) and Prydin-4- or -3-carbaldehyde (1 equiv) treated in ethanol in present of pyridine as the catalyst. (2) Simple treatment of latter compound with various benzyl halides.
Results: Biological activity Modified Ellman's method was used to determine anticholinesterase activity of our compounds and shows high inhibitory activity toward acetylcholinesterase.
Conclusions: In this work we've hydrated the pyrannocumarin and Benzylpyridinium moiety as acetylcholinesterase inhibitors. Assuming biological data, all synthesized compounds have shown moderate to high anticholinesterase activity against acetylcholinesterase.

Keywords: Benzylpyridinium; Cholinesterase inhibitor; Ellman's method