Evaluation of the effectiveness of some benzoxazole derivatives in the experimental Alzheimer's models in vitro

P-34-006

F. Kosova[I], Ö. Temiz Arpacı[II], F. Özdal Kurt[III], N. Umur[IV], S. Batur[V]

[I]Department of Biochemistry, Celal Bayar University School of Health Services, Manisa, Türkiye, [II]Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Ankara University, Ankara, Türkiye, [III]Departmend of Biology, Faculty of Science Celal Bayar Unv, Manisa, Türkiye, [IV]Manisa Celal Bayar Unv, Health of science, Manisa, Türkiye, [V]Department of Biology, Faculty of Science, Manisa Celal Bayar Unv,, Manisa, Türkiye

Alzheimer's disease (AD) is a common primary health problem, especially in the aging population. AD is a neurodegenerative disease characterized by loss of neurons and synapses, with extracellular plaques containing Aβ and intracellular neurofibrillary tangles containing tau. In this study, we were evaluated the preventative effect of the Aβ aggregation in the SH-SY5Y cells of the three different benzoxazole derivative compounds, which were called compounds 1, 2, and 3. After 24 hours of 40µM Aβ incubation, SH-SY5Y cells were treated for 24 and 48 hours with the three different benzoxazole derivative compounds separately and the proliferation of SHSY-5Y cells were assessed using the MTT assay. We observed significant neurite inhibition with moderate damage by the NST at IC50 dilutions of the compounds. Then AD's disease related Aβ plaque analyzed for the by microscopic and FOXA2 and PEN2 markers in vitro by ELİSA methods. At the end of the 24th and 48th hours, compound 2 and 3 treated cells were shown reduced Aβ plaque formation, while compound 1 treated cells were shown the same Aβ plaque formation manner according to the non-treated Aβ control group. However, compound 3 treated cells showed a higher reduction rate on the Aβ plaque formation in 40µM Aβ treated cells. Also, FOXA2 cytokine level was found to significantly decrease in the compound 2 treated cells. In contrast, FOXA2 cytokine level significantly increased in the compounds 1 and 3 treated cells according to the non-treated Aβ control group. On the other hand, the PEN2 cytokine level was significantly decreased in the compound 1, 2, and 3 treated cells. Additionally, neurite extension assays revealed that the compounds 3 treated cells were shown higher neurite extension rates. Thus, among the heterocyclic compounds we used, the compound 3 significantly prolongs the neuritis and may have a therapeutic effect while reducing beta-amyloid accumulation in AD's patients.