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The synthesis and vasorelaxing activity of 1, 4-disubstituted 1,2,3-triazoles in rat thoracic aorta

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Background and Aims: Triazole derivatives are widely used as anticancer, antituberculosis, antifungal, antibacterial, and anti-HIV. The present study compared the vasorelaxing activities of 12 triazoles, which were synthesized via an expedient method, with that of acetylcholine (Ach) using rat aortic rings.
Methods: Synthesis of β-Hydroxy 1,4-Disubstituted-1,2,3-triazole Derivatives. Epoxide/benzyl bromide (1 mmol), alkyne (1 mmol) and sodium azide (1.1 mmol) were mixed and stirred in water in the presence of the naocatalyst (2 mol %) at room temperature. After the completion of the reaction, the mixture was vacuum-filtered and washed with ethyl acetate. The organic layer was dried over anhydrous Na2SO4. Removal of the solvent under vacuum, followed by purification on silica gel column afforded the pure products. Preparation of the rat aorta. Thoracic aortic rings from 6 normal Sprague-Dawley rats were suspended for isometric tension recording. They were pre-contracted with Phe (10-6 M). Concentration-relaxation response curves to new compounds (10-9-10-4M) was performed at the plateau of contractile response to Phe. The IC50 (concentration necessary for 50% reduction of maximal Phe induced contraction) and maximal response (Emax) achieved for each compound were compared with that of acetylcholine. All compounds were dissolved in dimethylsulfoxide (DMSO) as stock solution (10-9-10-4M) as well as ACh (reference standard).
Results: The IC50 of 7-{[1-(2-hydroxy-2-phenylethyl)-1H-1,2,3- triazol-4-yl]methoxy}-4-methyl-4a,8a-dihydro-2H-chromen-2-one , N,N-bis{[1-(2-hydroxy-2-phenylethyl)-1H-1,2,3-triazol-4-yl]methyl}-4-methyl benzene sulfonamide, and (1R)-2-(4-butyl-1H-1,2,3-triazol-1-yl)cyclohexanol were more than that of Ach. The maximal response of 7-{[1-(2-hydroxy-2-phenylethyl)-1H-1,2,3- triazol-4-yl]methoxy}-4-methyl-4a,8a-dihydro-2H-chromen-2-one and (1R)-2-(4-butyl-1H-1,2,3-triazol-1-yl)cyclohexanol were comparable to Ach.
Conclusions: The findings of our study revealed that all of the compounds did have vasorelaxing activity on the isolated thoracic rat aorta and they may provide valuable therapeutic intervention for the treatment of hypertension.

Keywords: Triazole; Thoracic aorta; Vasodilating activity; Nano catalyst