Synthesis of Imidazolidine Derivatives by Three Components Reaction as a Novel Non-Steroidal Anti-Inflammatory Drugs

Abstract

There are many types of non-steroidal anti-inflammatory drugs (NSAID) act on one or more of cyclooxygenase enzymes (COX), there are at least three types of COX, which is COX-1, COX-2, and COX-3. They are responsible of inflammation and pain. The new compounds has been achieved by Three component reaction by mixed of amino acid (L-tyrosine), triethoxymethane and glycine in acetic anhydride with reflxed to give (compound 1) 3-(4-hydroxy phenyl)-2- (1H-imidazolidine-4-one-3-yl) propanoic acid. In the same way, compounds 2, 3, 4, and 5 were prepared by using the following amino acids: L-asparagine, L-histidine, L-tryptophan and glycine respectively to give 3-carbamido-2-(1H-imidazolidine-4-one-3-yl) propanoic acid (compound 2), 3-(1H-imidazole-5-yl)-2-(1H-imidazolidine-4-one-3-yl) propanoic acid (compound 3), 3-(1H-indole-3-yl) -2- (1H- imidazolidine- 4- one -3 - yl) propanoic acid (compound 4) and 2-(1H-imidazolidine-4-one-3-yl) ethanoic acid (compound 5). Compounds were identifying by CHNS analysis, FT-IR and H 1 NMR. The results certified the chemical structures of the compounds. The compounds were studied by two different tests the hot plate test and writhing test for analgesic activity, and two tests for anti-inflammatory activity they are formalin induced inflammation test and carrageenan induced inflammation test. The compounds were found out, has potent anti-inflammatory and anti-nociceptive activity. The compounds were tested to acute toxicity and fond that they are safety to the dose 5 g/kg orally in mice without any mortality, and suitable for use as new non-steroidal anti-inflammatory drugs.