Induction of Contracture and extracellular Ca2+ influx in Cardiac Muscle by Sanguinarine: A Study on Cardiotoxicity of Sanguinarine

鄭幼文;鄭慧文
Hu CM;Cheng YW;Cheng HW;Liao JW;Kang JJ

Abstract

In this study, the toxic effect of sanguinarine (SANG) on heart was studied with isolated cardiac muscle strip isolated from Wistar rat. SANG induced positive inotropic action followed by contracture on the left ventricle and both atria strips. In addition, SANG dose-dependently inhibited spontaneous beat of the right atrium. SANG-induced contracture was completely suppressed by pretreatment with La3+ or in a Ca2+ free Tyrode solution containing 2.5 mM EGTA. Incubating isolated cardiomyocytes with SANG enhanced the 45Ca2+ influx, which could be inhibited by pretreatment with La3+. However, the SANG-induced 45Ca2+ influx could not be inhibited by pretreatment with other Ca2+ channel blockers, such as nifedipine, verapamil, diltiazem, nickel and manganese, and amiloride. Although antioxidants can inhibit the SANG-induced lipid peroxidation, they could not prevent the SANG-induced contracture. N-acetylcysteine and dithiothreitol, the sulfhydryl reducing agents, were shown to be effective in preventing the SANG-induced contracture. These data suggested that the SANG-induced contracture is caused by the influx of extracellular Ca2+ through a La3+-sensitive Ca2+ channel.