Relaxant effects of butylidenephthalide in isolated dog blood vessels

柯文昌

Ko WC;Liao CC;Shih CH;Lei CB;Chen CM

摘要

Abstract

We investigated the reason why butylidenephthalide (Bdph) can have an antianginal effect without changing blood pressure in conscious rats. Isolated dog coronary artery (CA), femoral vein (FV), femoral artery (FA), and mesenteric artery (MA) were used to evaluate the relaxant effects of Bdph. Bdph concentration-dependently relaxed isolated CA, FV, FA, and MA precontracted by KCl (60 mM) and phenylephrine (phe, 5 microM) with the exception that CA was precontracted by prostaglandin F 2 alpha (PGF 2 alpha, 2 microM) instead of phe. The potency order of Bdph to these blood vessels was FV > CA > FA > or = MA. Bdph also concentration-dependently and non-competitively inhibited cumulative KCl (5 - 120 mM)- and phe (0.1 - 100 microM)-induced contractions in normal, and inhibited cumulative Ca 2+-induced contractions in depolarized blood vessels. The potency order of Bdph to these blood vessels was FV congruent with CA > FA congruent with MA. Bdph (0.02 - 0.04 mM) concentration-dependently and leftward-shifted the log concentration-response curves in parallel and significantly increased the pD 2 value of forskolin, but not nitroprusside in FV. Bdph (0.1 mM) did both in CA. Bdph (0.225 - 0.45 mM) did the opposite to that of nitroprusside, but not forskolin, in FA. Bdph (0.45 - 0.9 mM) did neither in MA. Bdph (0.1 - 1 mM) significantly inhibited cAMP- but not cGMP-PDE activities in these four blood vessels, suggesting that Bdph more selectively inhibited the former in these tissues. The above results suggest that the higher potencies of Bdph on FV and CA than on FA and MA, may be interpreted as the reason why Bdph is useful in the treatment of angina pectoris without changing blood pressure, after Bdph administration in vivo, because the venoreturn may be reduced and the coronary flow may be increased without affecting the arterioles, such as MA, the main determinant of blood pressure. Abbreviations. Bdph:butylidenephthalide Phe:phenylephrine PGF 2alpha :prostaglandin F 2alpha CA:coronary artery FV:femoral vein FA:femoral artery MA:mesenteric artery cAMP:adenosine 3',5'-cyclic monophosphate cGMP:guanosine 3',5'-cyclic monophosphate PDE:phosphodiesterase