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Vasorelaxant effect of diterpenoid lactones from Andrographis paniculata chloroform extract on rat aortic rings

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ABSTRACT

Background The aim of the present study is to evaluate the possible mechanism of the vasorelaxant effect of the Andrographis paniculata chloroform extract (APCE) and diterpenoids, such as, 14-deoxyandrographolide (DA) and 14-deoxy-11, 12-didehydroandrographolide (DDA), on rat aortic rings. Methods DA and DDA (10 muM to 40 muM) induce relaxation in the aortic rings pre-contracted with KCl (80 mM). Results The IC50 values are 40.47 +/- 1.44 and 37.43 +/- 1.41%, respectively, and this inhibition is antagonized by increasing the Ca2+ concentration in the Kreb's medium. The results indicate that APCE, DA, and DDA may have a calcium anatgonist property. APCE, DA, and DDA also relax norepinephrene (NE)-induced sustained contractions with IC50 values 41.63 +/- 1.19, 49.22 +/- 2.76, and 37.46 +/- 1.41% and this relaxant effect is unaffected by the removal of the endothelium or by the presence of indomethacin and N -nitroL-arginine (L-NAME). Moreover, DA and DDA inhibit the phasic and tonic contractions induced by NE in a concentration-dependent manner and show the most potent inhibition on phasic contraction ($P < 0.01$). Conclusion This study shows that APCE, DA, and DDA pre-treatment presents a more potent inhibition compared to post-treatment, after the tension has reached a steady state. These results suggest that the vasorelaxation of APCE, DA, and DDA direct the inhibition of the calcium influx. The vasorelaxant effect is more active in the calcium independent pathway and more sensitive in the intial stage of contraction.

KEYWORDS

Andrographis paniculata . APCE . aorta . 14-deoxyandrographolide . 14-deoxy-11 . 12-didehydroandrographolide . vasorelaxation

REFERENCES