Vasorelaxing effect of mesaconitine, an alkaloid from aconitum japonicum, on isolated rat small gastric artery: possible involvement of EDHF

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Aconiti tuber, roots of aconite (Aconitum japonicum), is an oriental herbal medicine therapeutically used for centuries in Japan and China to increase peripheral body temperature and to relieve rheumatic pain. The main constituents are aconite alkaloids; mesaconitine is pharmacologically the most active component. We have previously found that mesaconitine elicits endothelium-dependent relaxation mediated by release of nitric oxide in isolated rat aorta. In the present study, we performed experiments with isolated rat small gastric arteries and studied the potential involvement of endothelium-derived hyperpolarizing factor (EDHF). The arteries were mounted in a small vessel myograph containing Krebs-Ringer bicarbonate solution bubbled with 95% O2 and 5% CO2 at 37 °C. Mesaconitine elicited a concentration-dependent (10, 30, 100 µM) vasorelaxation in isolated rat gastric artery contracted with norepinephrine (5 µM), which was resistant to NO synthase inhibitor (L-NNA, 100 µM) and cyclooxygenase inhibitor (indomethacin, 50 µM). The L-NNA- and indomethacin-resistant relaxation by mesaconitine was mainly endothelium-dependent, inhibited by high K+ (30 mM) and by a combination of Ca2+-dependent K+ channel blockers, charybdotoxin (0.1 µM) and apamin (0.1 µM). The relaxation by mesaconitine was proportional to the external Ca2+ concentration (0.1, 0.3, 1 mM). These results suggest that mesaconitine elicits vasorelaxation of isolated rat small gastric artery mainly via release of EDHF.