Influence of long-term exposure of advanced glycation endproducts on vascular contraction in rat carotid artery

Keisuke Takayanagi, Takayuki Matsumoto, Mihoka Kojima, Kumiko Taguchi, Tsuneo Kobayashi

Dept. Physiol. and Morphol., Inst. Med. Chem., Hoshi Univ.

Although there are several reports suggested that advanced glycation end-products (AGEs) cause vascular endothelial dysfunction, the direct relationship between AGEs and smooth muscle contractile function remains unclear. Therefore, we investigated the long-term effects of AGE-bovine serum albumin (AGE-BSA) on contractile responses in rat carotid arterial rings using organ-culture technique. After exposure of AGE-BSA (0.001-0.1 mg/mL) for approximately 1 day in carotid artery, concentration–response curves were investigated under endothelium denuded artery. Contractile responses of high K^+ or serotonin did not alter among groups treated with and without AGE-BSA. Treatment with AGE-BSA (0.1 mg/mL) (vs. control; PBS) increased thromboxane A_2 analog-induced contraction, whereas decreased noradrenaline-induced contraction. The decreased noradrenaline-induced contraction by AGE-BSA was prevented by co-treated with organic cation transporter-3 (OCT-3) inhibitor corticosterone. The protein expression of OCT-3 in endothelium-denuded carotid artery was similar between control and AGE-BSA groups. These results suggest that ligand specific alterations of contractile responses by AGE-BSA exposure were seen in carotid arteries, and that decreased noradrenaline-induced contraction by AGE-BSA may be partly due to increased OCT-3 activity rather than the expression.