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Effect of age on endothelial function in rat aorta

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The influence of age on the endothelial modulation of angiotensin II (AII)-induced contractile response was investigated in isolated aortic rings of rats ranging in age from 0.7 to 20 months. Hemoglobin and L-NAME were used to examine whether age-related changes in the EDRF-releasing system were involved in endothelial modulation of AII-induced contraction in rat aorta. In all five age groups (0.7, 1.5, 3, 6, 20 months), hemoglobin (10 μM) significantly enhanced AII-induced contractile response only in aorta with endothelium intact. L-NAME (10 μM) produced a significant enhancement in AII responses in endothelium-intact aortas from rats aged 0.7 and 1.5 months, but it had no effect in aortas from older rats aged 6 and 20 months. Indomethacin (10 μM) did not affect AII-induced contractile responses in both endothelium intact and removed aortas from rats at the age of 0.7 to 20 months. Hemoglobin (10 μM) abolished acetylcholine-induced relaxation response in aortas from young and old rats. L-NAME completely abolished the relaxation in aortas from young (0.7 and 1.5 months), but incompletely in aortas from older (6 and 20 months) rats. The sensitivity of endothelium-dependent relaxation to A23187 increased with age between ages of 0.7 and 6 months, with no further increase noted up to 20 months of age. These results suggest that endothelial modulation of AII-induced contraction in rat aorta might involve age-related alteration in EDRF-releasing system, probably via post-receptor mechanism.