MODULATION WITH HIGH SALT DIET OF THE VASCULAR REMODELLING AFTER ENDOTHELIAL DENUDATION OF RABBIT CAROTID ARTERY

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Summary

Present experiments were designed to investigate the effects of chronic high salt diet on the vascular remodelling after endothelial denudation of the rabbit carotid artery. Marked intimal hyperplasia which had been histologically assessed (intima: media ratio, %) was observed 4 weeks after the endothelial denudation with balloon embolectomy catheter. The intimal hyperplasia was significantly attenuated when rabbits were given high salt diet (RC-4 containing 3% NaCl) for 8 weeks before and 4 weeks after the endothelial denudation. Net production of cyclic GMP stimulated by 10^{-6}M norepinephrine and 10^{-6}M acetylcholine was significantly decreased in the hyperplasic vessel wall, indicating the decreased NO production in the regenerated endothelial cells, which was recovered with high salt diet. Concentrations of N^G-monomethyl-L-arginine (L-NMMA) and asymmetric N^G,N^G-dimethyl-L-arginine (ADMA) in the regenerated endothelial cells as endogenous NOS inhibitors were significantly increased, while L-arginine concentration as a substrate for NO synthesis significantly decreased, leading to a significant increase in (L-NMMA + ADMA)/L-arginine ratio in the hyperplasic vessel wall. The increment of the ratio was significantly reduced after loading the high salt diet. These results suggest that accumulation of endogenous NOS inhibitors and decrease in L-arginine content are associated with the decreased NO production in endothelial cells and with neointimal formation. Loading high salt diet may inhibit these processes and, in turn, brings about an inhibition of the intimal hyperplasia. C-type natriuretic peptide 22 (CNP 22) are detectable in various peripheral tissues including blood vessel and plays an important role as a natriuretic factor and an inhibitory factor for intimal hyperplasia through increasing cyclic GMP production. The increase in CNP 22 content within the hyperplasic vassel wall was significantly augmented by loading high salt diet, suggesting compensatory natriuresis by increasing CNP 22 after loading high salt diet results in an inhibition of intimal hyperplasia.