Cytokines in Intimal Thickening of Arteries

Yasushi Saito, Tetsuto Kanzaki*, Masaki Shinomiya* and Nobuhiro Morisaki*

Key words: TGF-β, CNP, intimal thickening, smooth muscle cell (SMC), cytokines

The formation of arterial intimal thickening, which is observed in atheroma, is regulated by many factors. PDGF (platelet-derived growth factor) is the main regulator of the progression of intimal thickening. Some factors, such as TGF-β1 and CNP (C-type natriuretic peptide), are considered to be counterfactors because TGF-β1 and CNP inhibit the proliferation of arterial smooth muscle cells (SMC) in vitro. We examined the effect of TGF-β1 administration on the intimal thickening induced by balloon catheter injury. It was significantly higher in rabbits treated with 10 μg/kg of TGF-β1 and 10 mg/kg of aspirin (TGF-β group) than in those treated with 10 mg/kg of aspirin (control group) (Fig. 1). The matrix volume of the intimal layer was significantly more in the TGF-β group than in the control group (Fig. 2). The cell density did not differ between the two. These results suggest that TGF-β does not work to prevent intimal thickening in vivo. Next we checked the effect of CNP on intimal thickening. CNP was continuously infused to rabbits for 7 days after balloon catheter injury. The

4. The Role of Cytokines in Intimal Thickening of Arteries

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intimal thickening was reduced in the CNP infusion group compared with controls (Fig. 3), suggesting that CN may be one of the regulators which works against the formation of atheroma. These results indicate the importance of examining the in vivo effect by various growth factors on intimal thickening.

Fig. 1. Effect of TGF-β1 injection on intimal thickening of arteries in BCI rabbits. TGF-β1: Transforming growth factor-β1, BCI: Balloon catheter injury.

Fig. 2. Volume densities of extracellular matrix in the intimal layers of BCI arteries. BCI: Balloon catheter injury, TGF-β1: Transforming growth factor.

Fig. 3. Ratio of intima to media of carotid artery after balloon catheter injury. CNP: C-type natriuretic peptide.