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HYPERTENSION

Complement C1 and β-catenin in hypertensive arterial remodelling

Hypertension stimulates structural arterial remodelling, which is characterized by vascular smooth muscle cell (VSMC) hyperplasia and infiltration of inflammatory cells. The mechanisms of hypertensive arterial remodelling are poorly understood, but new findings demonstrate a key role for complement C1-induced activation of β-catenin signalling in this process. "Our findings provide a novel mechanistic link between humoral innate immunity and arterial remodelling," say the researchers.

Issei Komuro and colleagues first identified a role for β-catenin signalling in hypertensive arterial remodelling by investigating the effects of angiotensin II (Ang II) infusion in mice. Ang II infusion raised blood pressure, promoted arterial remodelling characterized by VSMC proliferation and upregulated the expression of Wnt/β-catenin target genes. Pharmacologic or genetic inhibition of β-catenin signalling suppressed VSMC proliferation without lowering blood pressure.

The researchers also found that Ang II infusion recruited macrophages into the aorta, and that these macrophages secreted the complement component C1q. Depletion of macrophages, administration of a C1 inhibitor or genetic ablation of C1qa suppressed Ang II-induced activation of β-catenin signalling and VSMC proliferation, identifying macrophage-secreted complement C1 as an inducer of β-catenin signalling and VSMC proliferation in hypertensive arterial remodelling.

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