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Extracellular matrix remodeling of subcutaneous small resistance arteries during essential hypertension

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Remodeling in microvascular structure may impair organ flow reserve and may be important in the support and also in the progressive worsening of hypertensive disease [1, 2]. In the development of hypertensive microvascular remodeling, a relevant role may be played by changes in extracellular matrix proteins [3]. Aim of this study was evaluate some extracellular matrix components within the tunica media of subcutaneous small arteries of 9 normotensive subjects and 12 essential hypertensive patients. Subcutaneous small resistance arteries were dissected and mounted on an isometric myograph and the tunica media to internal lumen ratio was measured. In addition, fibronectin, laminin, transforming growth factor-beta1 (TGF-β1) and emilin-1, important extracellular matrix components, were evaluated together with total collagen content and collagen subtypes. Small arteries of normotensive controls presented less total and type III collagen amounts with respect to hypertensive patients. Fibronectin and TGF-β1 contents were significantly greater in essential hypertensive patients, compared with normotensive subjects; while laminin and emilin-1 contents were lesser in essential hypertensive patients with respect to normotensive controls. Furthermore, a significant correlation was observed between fibronectin content and media to lumen ratio. In conclusion, our results indicated that in small resistance arteries of patients with essential hypertension may be detected a relevant fibrosis with increased fibronectin and TGF-β1 tunica media contents and decreased laminin and emilin-1 contents. These extracellular matrix changes might be involved in the remodeling of human small resistance artery and so extracellular matrix proteins may be possible targets for new anti-hypertensive drugs.

References

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Key words

Extracellular matrix, essential hypertension, microvascular remodeling, small resistence artery.