Effects of Telmisartan on Myocardial Protein Profiles in Hypertensive Rats

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Background: To investigate the effects of telmisartan on the protein profiles of the left ventricular myocardium in spontaneously hypertensive rats (SHR).

Methods: Sixteen SHR were randomly divided into control and telmisartan treatment groups. Rats were treated with sterile water (10 ml/kg) or telmisartan (4.33 mg/kg) by gavage for 12 weeks. Wistar-Kyoto (WKY) rats treated with sterile water (10 ml/kg) as controls. At the end of 12 weeks of control or telmisartan treatment, rats were sacrificed, and hearts were collected for protein preparations, isotope labeling, and mass spectrometric analysis.

Results: In total, there were 23 differentially expressed proteins in the left ventricular myocardium between control and telmisartan treatment groups in SHR. Compared with the telmisartan group, the upregulated proteins in the SHR were dual-specificity mitogen-activated protein kinase kinase 3-like, transgelin, and haptoglobin subtype 2. The downregulated proteins in the SHR were as follows: von Willebrand factor (fragment), kininogen 1, small ribonucleoprotein-related protein, fibrinogen beta chain, protein mass 3 (fragment), proteasome 26s, heat shock protein 27-related protein 1, tenascin X, fibronectin subtype 2, transferrin receptor protein, platelets 1, cathepsin L1, complement factor B, isoform CRA_b, fibrinogen isomer, immunoglobulin heavy chain (γ polypeptide), and α_1 antiprotease.

Conclusions: Telmisartan differentially regulates myocardial protein expression in hypertensive rats including heat shock protein 27, fibrinogen, fibronectin, proteasome 26s, and transgelin, as well as proteins in biochemical, metabolic, and signal transduction pathways. These changes in protein expression may contribute to the antihypertrophic effects of telmisartan in hypertension.

The Influence of Abdominal Obesity on Endothelial Function of the Tibial Artery in the Elderly Essential Hypertensives of Different Sex

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Background: To investigate the relationship between abdominal obesity and endothelial function of the tibial artery in the elderly essential hypertensives of different sex.

Methods: A total of 658 elderly patients (≥60 years old) with essential hypertension and 64 elderly subjects without clinical evidence of hypertension were recruited from the department of geriatrics from August 2000 to May 2016. The dilatation of anterior tibial artery induced by reactive hyperemia was examined by high-resolution vascular ultrasound and was defined as endothelium-dependent dilatation (EDD). All the participants were divided into 4 groups based on blood pressure (≥140/90 mm Hg) and waist circumference (male ≥90 cm, female ≥85 cm): normotensive without abdominal obesity (n = 34), normotensive with abdominal obesity (n = 30), hypertensive without abdominal obesity (n = 287), and hypertensive with abdominal obesity (n = 371).

Results: A gradual decline in EDD was observed from normotensive without abdominal obesity (9.37 ± 1.11%), normotensive with abdominal obesity (8.59 ± 0.99%), hypertensive without abdominal obesity (7.70 ± 0.30%) to hypertensive with abdominal obesity (6.75 ± 0.26%) (P < 0.05). There was no significant difference in EDD between the male and female elderly hypertensives with or without abdominal obesity. In male elderly hypertensives, EDD in those with central obesity was more blunted compared with those without central obesity (6.31 ± 0.38% vs. 7.46 ± 0.38%, P < 0.05). Whereas, in female elderly hypertensives, EDD in those with abdominal obesity was similar to those without abdominal obesity. In male elderly hypertensives, EDD was correlated with waist circumference (r = −0.194, P < 0.05) while such association was not shown in females. Multivariate linear regression analysis revealed that waist circumference was associated with EDD (β = −0.161, P < 0.05) in the male elderly hypertensives, but not in females.

Conclusions: Waist circumference is an influencing factor of EDD in male elderly essential hypertension patients. However, abdominal obesity has little effect on EDD of the tibial artery in female elderly hypertensives.