Increased blood viscosity implies clustering of multiple metabolic abnormalities in essential hypertension

Fumihiro Tomoda
Fukui Health Science University, Japan

In skeletal muscle, increased blood viscosity can reduce nutritional blood supply and thereby influencing insulin sensitivity, uric acid production and oxygen utility. Although blood viscosity elevates in hypertension, the associations of blood viscosity with limbs circulation and metabolism reminded to be elucidated in hypertension. In 116 untreated essential hypertensives without apparent cardiovascular damages, blood viscosity, forearm vascular resistance and biochemical indices were measured by falling-ball microviscometer, venous-occlusion plethysmography and laboratory tests, respectively. The relationships between blood viscosity and the other measured parameters were evaluated. Forearm vascular resistance correlated positively with blood viscosity (r=0.240). Concomitantly with the increase in blood viscosity, both plasma insulin and HOMA ratio elevated without changes in blood glucose (r=0.238, 0.205). Additionally, serum uric acid, plasma lactate and C-reactive protein also elevated together with the increase in blood viscosity (r=0.404, 0.286, 0.199). In essential hypertensives, increase blood viscosity was associated with the worsening of insulin sensitivity, uric metabolism, aerobic metabolism and inflammation as well as the reduction in limbs blood flow. The increased blood viscosity could imply the clustering of multiple metabolic abnormalities in essential hypertension.

Recent Publications:

1. Ohara M and Tomoda F (2015) T Pubertal administration of antiserum against nerve growth factor regresses renal vascular remodeling in spontaneously hypertensive rats. Clin Exp Pharmacol Physiol. 42(6):687-694.
2. Takiwaki M and Tomoda F (2014) Increased levels of small dense low-density lipoprotein cholesterol associated with hemorheological abnormalities in untreated, early-stage essential hypertensives. Hypertens Res. 37(11):1008-1013.
3. Yamazaki H and Tomoda F (2014) Renal vascular structural properties and their alterations by removal of uraemic toxins in a rat model of chronic kidney disease. Clin Exp Pharmacol Physiol. 41(3):238-245.

Biography

Fumihiro Tomoda is a Professor at Fukui Health University. He belongs to Japanese Society of Internal Medicine, Japanese Society of Nephrology, Japanese Society of Hypertension, Japanese Society for Dialysis Therapy and Japanese Circulatory Society. Currently, he is in the position of Editor-In-Chief for the Journal of "Insights in Blood Pressure". He is a Specialist in Clinical Nephrology and Cardiology and he has Medicine Doctor's degree and was awarded at Toyama Medical and Pharmaceutical University. His researches focus on sympatho-adrenal system and its clinical implication in hypertension, renal vascular structural remodeling and its possible influences on renal hemodynamics in hypertensive or CKD animal models and hemorheologic characteristics and its clinical implication in cardiovascular disease.

Notes: