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AGGRAVATION OF INSULIN RESISTANCE INDUCED BY MENTAL ARITHMETIC STRESS IN ESSENTIAL HYPERTENSIVES COMPLICATED WITH METABOLIC SYNDROME

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In essential hypertensives (EHT), the complication of metabolic syndrome (Mets) enhances sympatho-adrenal system and its responsiveness to stress. Although sympatho-adrenal activation can reduce insulin sensitivity, the influences of acute stress on insulin sensitivity remains to be elucidated in EHT when complicated with Mets. In this study, therefore, the effects of mental arithmetic stress (10-minute serial subtraction of 7 from 1000) on insulin sensitivity were compared between 39 EHT with Mets and 51 EHT without Mets. Before stress, fasting blood glucose (FBS), fasting plasma insulin (PI) and homeostasis model assessment of insulin resistance (HOMA-IR, i.e., index of insulin resistance) were higher in EHT with Mets than in EHT without Mets, although blood pressure, pulse rate and plasma levels of noradrenaline (PNA) and adrenalin (PAD) did not differ between both groups. Arithmetic stress increased blood pressure and pulse rate to the similar extent in both groups. Although stress increased PNA and PAD in the two groups, the increase of PNA induced by stress was greater in EHT with Mets than in EHT without Mets. FBS did not change following stress in either group. Contrary, IR and HOMA-IR increased after stress in both groups. Furthermore, the increases of IR and HOMA-IR induced by stress were more pronounced in EHT with Mets (1.76 1.22 to 2.10 1.30) comparted with EHT without Mets (0.97 0.60 to 0.99 0.54) (group×stress interaction: p< 0.05). In EHT complicated with Mets, metal arithmetic stress aggravated insulin resistance concomitantly with the exaggerated activation of sympathetic nervous system.

Biography

Fumihiro Tomoda is a Professor of Fukui Health Science University. He belongs to Japanese Society of Internal Medicine, Japanese Society of Nephrology, Japanese Society of Hypertension, and Japanese Society for Dialysis Therapy and Japanese Circulatory Society. Currently, he is also in the position of Editor-In-Chief for the Journal of *Insights in Blood Pressure*. He got Specialist degree in Clinical Nephrology and Cardiology, Medicine Doctor's degree (PhD, Thesis: systemic and renal hemodynamics in essential hypertension) and several awards at Toyama Medical and Pharmaceutical University. His research has focused on sympatho-adrenal system and its association with cardiovascular risk factors such as cardiovascular structural remodeling, platelet activation, hemorheologic abnormalities and metabolic disorder in hypertension.

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