**EFFECTS OF PERIVASCULAR ADIPOSE TISSUE ON VASODILATION DIFFER BY THE SEVERITY OF METABOLIC DISORDERS**

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Metabolic syndrome (MetS) facilitates the development of cardiovascular disease due to atherosclerosis. We demonstrated that nitric oxide-dependent vasodilation is impaired with exposure to metabolic abnormalities in the mesenteric arteries of SHRSP.Z-Leprfa/IzmDmcr (SHRSP.ZF) rats, an animal model of MetS. In contrast, perivascular adipose tissue (PVAT), which is located outside the blood vessels, has been recently recognized as playing a role in vascular function. We have proposed that PVAT of resistant arteries of SHRSP.ZF rats helps in vasodilation regulation to compensate for impaired vasodilation observed in MetS. Therefore, we examined whether the compensatory effects of PVAT are also observed in MetS in the arteries of Otsuka Long-Evans Tokushima Fatty (OLETF) rats before type II diabetes onset. We used 20-week-old OLETF and control Long-Evans Tokushima Otsuka (LETO) rats. The body weight, waist/body length ratio, and serum lipid and glucose levels of OLETF rats were higher than those of LETO rats, but blood pressure was unchanged. Relaxations in response to nitroprusside were impaired in the isolated mesenteric arteries of OLETF rats compared with those of LETO rats, which is similar to that observed in SHRSP.ZF rats. The relaxation in the arteries enveloped by PVAT was the same in those not enveloped by PVAT in OLETF rats, which differs with that observed in SHRSP.ZF rats. These results indicate that the remarkable degree of the metabolic abnormalities, especially high blood pressure, is associated with the appearance of the compensatory effects of PVAT on vasodilation in MetS.