The responses to noradrenaline, phenylephrine and clonidine in the vascular smooth muscle of SHRSP. Noriko Murakami, Atsuko Niwa, Hideaki Higasino, and Aritomo Suzuki. Department of Pharmacology and of Prasiltology, Kinki University School of Medicine, Osaka-fu 589.

There is now considerable reports that sympathetic $\alpha$-receptor may be divided into two subtypes, termed $\alpha_1$- and $\alpha_2$, existing postsynaptically and $\alpha_2$ existing presynaptically. It is known that phenylephrine selectively acts on $\alpha_1$ receptor, clonidine comparatively selectively acting on $\alpha_2$-receptor and noradrenaline acting both receptors. The authors already have reported that postsynaptic $\alpha_2$-receptor may exist in the aorta, portal vein and mesenteric artery of rats. In this paper, investigating the responses to noradrenaline, phenylephrine and clonidine in portal vein, aorta, mesenteric artery and spleen from WKY and SHRSP, the authors described the difference of $\alpha_1$- and $\alpha_2$-receptor between WKY and SHRSP.

Materials and methods: Six month old SHRSP and WKY were used. The isolated aorta, portal vein, mesenteric artery and spleen were hung in Magnus' instrumnet containing Locke solution. The change of tonus was recorded isometrically.

Results: The contractions by phenylephrine (PhE) and clonidine (Clon) were compared with the maximal contraction by noradrenaline (Nad). 1). Aorta. The maximal contractions by PhE and Clon were 96% and 35% of that by Nad in SHRSP, respectively, and these in WKY were 100% and 32%, respectively. $pD_2$ values of Nad, PhE and Clon were 6.6, 6.4 and 6.7 in SHRSP and 6.9, 6.4 and 7.0 in WKY, respectively. 2). Portal vein. The maximal contractions of PhE and Clon were 96% and 35% in SHRSP and 100% and 32% in WKY, respectively. $pD_2$ values of Nad, PhE and Clon were 6.6, 6.4 and 6.7 in SHRSP and 6.9, 6.5 and 7.0 in WKY, respectively. 3). Mesenteric artery. The maximal contractions by PhE and Clon were 94% and 23% in SHRSP and 100% and 16% in WKY, respectively. $pD_2$ values of Nad, PhE and Clon were 7.8, 6.9 and 7.3 in SHRSP and 7.5, 6.7 and 6.5 in WKY, respectively. 4). Spleen. The maximal contractions by PhE and Clon were 70% and 17% in SHRSP and 73% and 12% in WKY, respectively. $pD_2$ values of Nad, PhE and Clon were 6.1, 5.6 and 6.3 in SHRSP and 6.3, 5.7 and 5.8 in WKY, respectively.

Discussion: Clon produced the contraction in the organs tested, and thus it is thought that $\alpha_2$-receptor exists in those organs. But the contraction by Clon was much smaller than that by PhE. This suggests that the role of $\alpha_2$-receptor in the contraction is much smaller than that of $\alpha_1$-receptor. The contractions by Clon in the aorta and portal vein showed no difference between SHRSP and WKY, but that in the mesenteric artery and spleen was larger in SHRSP than in WKY. These results suggest that the reactivity of $\alpha_2$-receptor of SHRSP was almost the same as that of WKY in the portal vein and aorta, being different in the mesenteric artery and spleen. The $pD_2$ values of Clon in the aorta and portal vein in SHRSP were almost the same as those in WKY, but the $pD_2$ values of the mesenteric artery and spleen in SHRSP were larger than those of WKY. These results suggest that the affinity of $\alpha_2$-receptor in the aorta and portal vein was not different between SHRSP and WKY, that in mesenteric artery and spleen being different between WKY and SHRSP. On the other hand, the maximal contraction by PhE was not different between SHRSP and WKY in the organs tested and also the $pD_2$ values in SHRSP was almost the same as that in WKY in the organs tested. Thus, the reactivity and the affinity of $\alpha_2$-receptor may be not different between SHRSP and WKY.

Conclusion: The responses to $\alpha_4$- and $\alpha_1$-stimulants in the isolated aorta, portal vein, mesenteric artery and spleen were compared between SHRSP and WKY. 1. The response to PhE was not different between SHRSP and WKY in the organs tested. 2. The responses to Clon was larger in SHRSP than in WKY in the mesenteric artery and spleen, but there was not different between SHRSP and WKY in the portal vein and aorta.