41) Development of Sympathetic Nervous System in Stroke-prone SHR (SHRSP). Yukio Yamori, Ichiro Akiyuchi*, Ryoichi Horie, Akira Ooshima, Michiya Ohtaka, and Yasuo Nara. Japan Stroke Prevention Center, Department of Pathology, Shimane Medical University, Izumo 693 and Department of Gerontology, Faculty of Medicine, Kyoto University, Kyoto 606*.

INTRODUCTION Recently, we have demonstrated using the histochemical fluorescence technique that the cerebral cortex and intracerebral arteries in young and adult SHRSP had central noradrenaline terminals with an augmented fluorescence. In the present study we further investigated the adrenergic innervation of cerebral and peripheral blood vessels in SHRSP at various ages using a highly sensitive glyoxylic acid fluorescence method.

MATERIALS AND METHODS Thirty male SHRSP and 15 male Wistar-Kyoto rats (WK) at the age of 1 to 3 days, 3 weeks, and 3 months were sacrificed under ether anesthesia. The basilar arteries, middle and anterior cerebral arteries, renal arteries and mesenteric arteries were excised from the rats, and immersed and fixed in highly concentrated (14%) glyoxylic acid solution for fluorescence microscopic observation.

RESULTS In the whole mount preparation of each artery of SHRSP at various ages, the green fluorescence of adrenergic varicose fibers appeared fairly thick in diameter and had high density compared to those of WK at various ages. The dense nerve meshwork which corresponded to the adult type of innervation in the mesenteric arteries were observed in both SHRSP and WK 3 weeks after birth. On the other hand, ring-like and meshwork-like adrenergic innervation in the cerebrobasal arteries was already visible in both SHRSP and WK at the age of 1 to 3 days, though the varicose fibers were fine in diameter than those found in the adult rats. The fluorescence histochemical findings on the development of sympathetic aminergic fiber in stroke-prone SHR are summarized in the Table.

Arteries	1-3 Days		3 Weeks		3 Months	
	SHRSP (10)*	WK (5)	SHRSP (10)	WK (5)	SHRSP (10)	WK (5)
Basilar Artery	fine**	very fine	fairly thick	fine	thick	fine
	ring-like & meshwork-like***	same	ring-like & meshwork-like	same	ring-like & meshwork-like	same
	fine	very fine	fairly thick	fine	thick	fine
Mid. & Ant. Cerebral Artery	meshwork-like & ring-like	same	meshwork-like & ring-like	same	meshwork-like & ring-like	same
	very fine	same	thick	fairly thick	thick	fairly thick
Mesenteric Artery	coarse	same	dense	same	dense	same
	meshwork-like	same	meshwork-like	same	meshwork-like	same
Renal Artery	very fine	same	thick	fairly thick	thick	fairly thick
	coarse	same	meshwork-like	same	meshwork-like	same

* No. of Rats, ** Density of the Varicosities, *** Type of Innervation.

SUMMARY AND DISCUSSION The noradrenergic fluorescence at the nerve terminals was augmented during the ontogenic development in the mesenteric arteries, cerebrobasal arteries and renal arteries of SHRSP. The finding suggests that the sympathetic aminergic neuron system may be altered genetically in SHRSP. The nervous system in young SHRSP may accelerate the vasomotion of systemic and cerebral arteries, leading to severe hypertensive vascular lesions observed in adult SHRSP.

ACKNOWLEDGEMENTS This study was supported by grants from NIH, USA (HL 1775), The Science and Technology Agency of the Government of Japan, Japan Society for the Promotion of Medical Science, Mitsubishi Foundation, Japan Tobacco and Salt Public Corporation, Foundation for Adult Diseases and Foundation for Metabolic Diseases.