64) Ophthalmological Studies on the M-Strains of Stroke-Prone Spontaneously Hypertensive Rat. Yoh Hamada, Toshifumi Otori, Takaaki Chikugo, Yoshio Ohta and Kozo Okamoto. Department of Ophthalmology, Tondabayashi Hospital, Kinki University School of Medicine, Department of Pathology, Kinki University School of Medicine, Osaka-fu 589. Japan.

Introduction: In 1984, Okamoto et al established a colony of M-strain of stroke-prone spontaneously hypertensive rats (M-SHRSP) by selective brother-sister breeding of SHRSP siblings with early and severe hypertension under antihypertensive treatment. The M-SHRSP rats are the best experimental animals for studying the symptoms and course of the hypertension that is very similar to those found in human juvenile malignant hypertension. The purpose of this study is to examine changes of the retinal and choroidal vessels in the fundus of M-SHRSP rats from the age of eight weeks to their death using fundusoscopic and fluorescein angiographic methods.

Materials and Methods: About twenty male M-SHRSP rats were selected from 200 M-SHRSP rats and their blood pressure was measured weekly by the tail pulse pick-up method without anesthesia. By using a handheld Kowa fundus camera, fundus photographs were taken and fluorescein angiographic studies were performed by injecting 0.05 cc of 10% fluorescein sodium into the tail vein of the M-SHRSP without anesthesia. Histopathological observation was also done with a light microscope using hematoxylin-eosin stain or PAS stain.

Results: In this study, blood pressure rose to more than 220 mmHg in 8-week-old and 10-week-old M-SHRSP, all of which showed a blood pressure of more than 250 mmHg. In the 8-week-old M-SHRSP, general narrowing of the retinal arterioles was observed, but the fluorescein dye did not leak through the wall of the retinal arterioles. At the age of nine weeks, fluorescein dye began to leak through the retinal arteriolar walls. As the M-SHRSP progressed in age, stenosis and caliber irregularities of the retinal arterioles showed more severe changes in the fundus. There were rosary-like changes in the retinal arteriole and retinal edema was also observed at twelve weeks or later. Vitreous hemorrhage was observed in many M-SHRSP rats. Histopathological studies showed that in spite of the marked changes of the retinal vessels in the fundus, little significant histological changes could be found. We were also able to observe the choroidal vessels through the retinal pigment epithelium in albino M-SHRSP. At eight to nine weeks of age, the choroidal vessels were observed to be tortuous in M-SHRSP, and at ten to twelve weeks, the hypertensive changes of the choroidal vessels were observed to increase. Histologically, marked thickening of the walls of the choroidal arterioles was noticed in the M-SHRSP.

Conclusion: We observed severe ophthalmoscopic changes in the retinal vessels in M-SHRSP and also in the choroidal vessels through the pigment epithelium within 10 weeks. This seems to suggest that a funduscopic study of the retinal vessels and choroidal vessels of M-SHRSP is the best way to study vascular changes of juvenile malignant hypertension.