25) Chorioretinal Changes in Diabetic Stroke-Prone Spontaneously Hypertensive Rats induced Streptozotocin (II) Shigeki Takahashi

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The author has previously reported (21st Congress on Spontaneously Hypertensive Rats) on the histological changes in the retina, choroid and retinal vessels one week after the SHRSP's were made diabetic by means of alloxan and streptozotocin. In the present study the author further investigated histologically changes in the retina, choroid and retinal vessels of SHRSP's three months after they were made diabetic by injection of streptozotocin.

Methods: Five SHRSP's, two months old, 150g, were used for each experimental group. Diabetes was induced by tail vein injection of 65 mg/kg of streptozotocin in 0.5 ml of citrate buffer solution (pH 4.5). The control group received no medication.

Results: The SHRSP's which were given streptozotocin developed a strong positive urinary sugar reaction and high blood sugar two days post-injection.

Their fundi were examined ophthalmoscopically once every week for three months. In the fundoscopic examination, narrowing and caliber irregularities of the retinal arterioles were observed, but no hemorrhage or white patches were observed. Histologically the diabetic rats showed more marked axonal changes in the retina than the control animals. In the retinal vessels thickening of the basement membrane, vesicles of the endothelial cells and degeneration of micro-organelles in the muscle layer were noticed. In the choriocapillaries vesicles of the endothelial cells was observed.

Discussion and Conclusion: The author has reported that in the retina of hypertensive rats which were rendered acutely diabetic axonal changes in the nerve fiber layers were particularly conspicuous, and these early changes were related to the development of retinopathy in the later stages.

In this study, the author investigated histologically changes in the retinal vessels in three-month-old diabetic SHRSP's. Thickening of the basement membrane was observed in the retinal vessels, vesicles of endothelial cells and degeneration of micro-organelles in the muscle layer, which is regarded as an early vascular change in hypertensive diabetes. It is suggested that these changes in the vascular basement membrane and axons in the nerve fiber layer may interact in the development of diabetic retinopathy in these experimental animals.