41) Hypertensive Papilledema in M-Strain Stroke-Prone Spontaneously Hypertensive Rats.

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Introduction:

M-strain stroke-prone spontaneously hypertensive rats (M-SHRSP) develop severe hypertension and death appears by the 15th week of age. Severe hypertension causes various fundus changes, but typical hypertensive papilledema in the fundus is rarely observed. In our experiment in which we administered hypotensive drug to M-SHRSP, we observed typical hypertensive papilledema in the M-SHRSP. The purpose of this study was to examine pathological changes of hypertensive papilledema in M-SHRSP and to compare the differences with that of humans.

Materials and Methods:

Seven M-SHRSP rats, which showed hypertensive papilledema in the fundus, were selected from M-SHRSP. Each bulbus was enucleated and paraffin embedded sections or trypsin digested flat preparations were made. Histopathological observation was done with a light microscope using hematoxylin-eosin stain, Azan Mallory's stain or PAS-hematoxylin stain.

Results:

In M-SHRSP with hypertensive papilledema, cytooid bodies were observed in the nerve fiber layer of the retina. Marked swelling of the optic disc and lateral displacement of the retina away from the end of Bruch's membrane were observed. In the vertical sections of the bulbus of M-SHRSP with papilledema, intraluminal stenosis of the central retinal artery was found. Trypsin digested flat preparation showed accumulation of edema fluid at the disc of the M-SHRSP. In the M-SHRSP, occlusion of capillaries was found around the retinal peripapillary area. Retinal arteriolar sclerosis was also most prevalent in this area.

Conclusion:

In the rat's eye ball, the ophthalmic artery enters just behind the bulbus and the central retinal artery is very short compared with that of humans. Therefore, the cerebro-spinal pressure does not affect the axoplasmic transport of lamina cribrosa in rats but it does in humans. In the M-SHRSP with hypertensive papilledema, pathological examinations showed intra-luminal stenosis of the central retinal artery and accumulation of edema fluid in the discs of the M-SHRSP. Although there are anatomical differences in the central retinal artery of rats and humans, ischemic change of the optic nerve head induced by the intra-luminal stenosis of the central retinal artery may play an important role in the evolution of hypertensive papilledema.