Ophthalmic and Central Retinal Artery Flow Velocities in Hemodialysis Patients

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Dear Sir,

Decreased distensibility of large arteries, vascular calcifications, and alterations of cardiac output, peripheral vascular resistance, cardiovascular reactivity due to structural or functional changes, and autonomic nervous system function are well-known features in hemodialysis patients, and these factors may affect the systemic and the regional circulation in these patients. The aim of this study was to evaluate central retinal and ophthalmic artery flow velocities in hemodialysis patients.

Ten nondiabetic hemodialysis patients (5 males and 5 females) with a mean age of 34.1 (range 22-50) years and a mean time on dialysis of 23.5 (range 2-132) months and 10 healthy controls (10 males) with a mean age of 29.5 (range 24-60) years were included in the study. None of the patients had primary heart disease. All of the hemodialysis patients had either first- or second-degree hypertensive retinopathy according to the Keith-Wegener classification. Color Doppler echocardiography (Toshiba Sonolayer, model SSH-160A, 3.75-MHz transducer) has been performed to the right orbita and heart in the supine position by a cardiologist who was unaware of the subjects' status (hemodialysis patient or healthy control). Student's t test was performed for statistical analysis. The results are summarized in table 1. The mean ophthalmic and central retinal artery flow velocities were lower in hemodialysis

Table 1. Mean ophthalmic and central retinal artery flow velocities in hemodialysis patients and healthy controls (mean $\pm$ SEM)

Parameter

Controls

Hemodialysis patients

Ophthalmic artery flow velocity, cm/s	40.9 $\pm$ 3.8	44.4 $\pm$ 3.0
Central retinal artery flow velocity, cm/s	11.4 $\pm$ 1.0	12.7 $\pm$ 0.3
Aorta flow velocity, cm/s	104.4 $\pm$ 1.8	111.6 $\pm$ 3.8
Ophthalmic artery/aorta flow velocity	39.4 $\pm$ 3.9	40.4 $\pm$ 3.3
Central retinal artery/aorta flow velocity	11.1 $\pm$ 1.0	11.6 $\pm$ 0.4

Reference

Guthoff RF, Berger RW, Winkler P, Helmke K, Chumbley LC: Doppler ultrasonography of the ophthalmic and central retinal vessels. Arch Ophthalmol 1991;109:532-536.

patients than in the healthy controls, but this was not statistically significant ($p > 0.05$).

Recently color Doppler ultrasonography has been used for the measurement of ophthalmic and retinal artery flow velocities in normal subjects [1], and as far as we know this is the first report evaluating the ophthalmic and retinal artery flow velocities in hemodialysis patients.

Our results suggest that ophthalmic and retinal artery flow velocities might lessen in hemodialysis patients, but the number of patients in this study was limited, and more studies are needed for definite conclusions.