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Lacunar Infarcts in a Hypertensive Population and Their Correlation With Systemic Vascular Resistance

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Introduction: Lacunar infarcts (LI) result from disease of the small cerebral arteries. An LI is a subcortical ischemic lesion at the level of a single perforating artery, with a diameter ranging from 100 to 400 μm and generally originating at right angles directly from the main arteries. Single lesions may result in no significant loss of function. We studied 67 consecutive hypertensive patients who underwent brain MRI for suspected central nervous system (CNS) pathology and compared their systemic vascular resistance (SVR) data with 133 hypertensive patients without suspected CNS pathology. All hypertensive patients were on antihypertensive medications. Since elevated SVR in treated hypertensives may represent small artery constriction, we postulated that patients with documented LIs may have higher SVR compared with those without suspected LIs.

Methods: Hypertensive patients with suspicion of CVS pathology underwent magnetic resonance imaging (MRI) of the brain. Neuroradiologists read the MRI scans in a standard fashion

and diagnosed LI as subcortical infarcts measuring 3 to 20 mm. Cerebral infarcts (CI) and white matter disease (WMD) were also noted. SVR was measured using BioZ ICG Monitor (CardioDynamics, San Diego, California) and was considered elevated if it was more than $1,378 \text{ dynes} \times \text{s/cm}^5$.

Results: We studied 200 patients with ages ranging from 37 to 94 years. Of these 200 patients (114 [57.0%] males and 86 [43.0%] females), 67 (41 [61.2%] males and 26 [38.8%] females) had undergone a brain MRI. Of the latter group, 49 (73.1%) were abnormal. Of these 49, 29 (43.3%) had LI, 8 (11.9%) had CI, and 15 (22.4%) had WMD. Of the 49 with pathology, 36 (73%) had elevated SVR. Of those with LI, 19 (65.5%) had elevated SVR. Of those with CI, 5 (62.5%) had elevated SVR. Of those with WMD, 12 (80.0%) had elevated SVR. Of the 18 (26.9%) normals, 12 (66.7%) had elevated SVR. In the group of 133 patients (73 [54.9%] males and 60 [45.1%] females) without brain MRI, 60.8% of patients had high SVR.

Conclusions: The majority of hypertensive patients undergoing brain MRIs for evaluation of clinical symptoms or signs of CNS disorder show abnormalities. The most common finding is LI. Most hypertensive patients on treatment maintain a high SVR. Patients with CNS disease appear to have a tendency toward higher SVR compared with hypertensive patients without suspected CNS pathology. We found no relationship between elevated SVR and LI in this hypertensive population.