

Association Between Left Atrial Enlargement and Target Organ Damage in Essential Hypertension

Left ventricular hypertrophy (LVH) is a well-known form of target organ damage in essential hypertension and its development is associated with increased cardiovascular morbidity and mortality.¹ According to the Framingham Heart Study, increased left atrial (LA) size is associated with an increased prevalence of atrial fibrillation and is a significant predictor of an increased likelihood of developing stroke in men and of death in both genders.² This effect is thought to be partially mediated by left ventricular (LV) mass.² The SHEP (Systolic Hypertension in the Elderly Program) study demonstrated a significantly increased LA index (LA size/body surface area) among the hypertensive patients.³ Furthermore, Vaziri et al reported that increased levels of systolic and pulse pressures, as well as LV mass, were significantly associated with increased left atrial size.⁴ The magnitude of association between blood pressure and left atrial size was modest, particularly after controlling for age and body mass index.⁴ Gottdiener et al⁵ extended these observations, noting that in patients with established hypertension and with a high prevalence of LVH, obesity is the most important predictor of LA size and LA size indexed by height, and that it magnifies the relation between LV mass and LA size.⁵ Recently, Simek et al pointed out that in patients with essential hypertension and normal left ventricular systolic function, LA size correlates with LV wall thickness and may better reflect the chronicity and duration of LA hypertension, providing a simple noninvasive assessment of the degree of LV diastolic dysfunction.⁶

Although an apparent relationship exists between LV mass and LA size in hypertensive patients, the association of LA enlargement with the presence of other target organ damage in hypertensive subjects, including hypertensive retinopathy and microalbuminuria, hasn't been studied yet. We report here the preliminary results of 66 untreated patients (29 men and 37 women, mean age 47 ± 11 years) with moderate hypertension (systolic blood pressure 140 to 170 mm Hg and diastolic blood pressure 99–109 mm Hg). Two-dimensional and M-mode echocardiography together with Doppler examination to exclude the presence of mitral regurgitation were performed for all patients by the same cardiologist. The LV mass index was calculated according to the Penn convention method; LVH was defined as left ventricular mass $> 110 \text{ g/m}^2$ for women and 134 g/m^2 for men.⁷ Left

atrial size was determined in accordance with the American Society of Echocardiography guidelines⁸ and was indexed by body surface area (left atrial index, LAI); LAI of 2.2 cm/m^2 was used as the partition value for left atrial enlargement.⁹ The intraobserver variability for the measurements of LA size, LV wall thickness, and LV dimensions were 1.6%, 4.2%, and 2.7%, respectively. After a negative urine culture was obtained, 24-h samples of urine for measurement of rate of albumin excretion were taken. If at least two of three measurements of rate of albumin excretion were between 30 mg/day and 300 mg/day the patient was qualified as having microalbuminuria. The fundoscopic examinations were performed by the same ophthalmologist, who was blinded with respect to all clinical and laboratory data.

Left atrial enlargement was present in 21 patients (32%). In the group of patients with enlarged LA, LVH was present in 62% (13/21), whereas in 38% (8/21) left atrial enlargement was an isolated finding. Hypertensive retinopathy was found in 71% of the patients (47/66). It was present in 95% (20/21) of patients with LA enlargement but only in 60% (27/45) in the group without left atrial enlargement. The retinopathy was defined as grade I in 40% (19/47), grade II in 53% (25/47), and grade III in 6% (3/47) of patients; 45% (30/66) of the patients had microalbuminuria. Microalbuminuria was present in 62% (13/21) of patients with LA enlargement, in contrast to 38% (17/45) in the group without LA enlargement. When analyzed with χ^2 test, there was a significant association between the presence of LA enlargement and LVH ($P < .01$). A significant association was also found between the presence of hypertensive retinopathy and LA enlargement ($P < .01$), even after adjustment for LVH. On the other hand, a statistically significant association between the presence of microalbuminuria and LA enlargement could not be demonstrated ($P > .01$). In the group of patients with concomitant presence of LVH and LA enlargement (13/66), hypertensive retinopathy was present in 92% (12/13) and microalbuminuria in 60% (8/13). There was a statistically significant association with the presence of microalbuminuria in this group when compared to groups of patients with only LVH or with isolated LA enlargement.

These preliminary results demonstrate that in hypertensive subjects a significant association exists between the presence of LA enlargement and target

organ damage, including LVH and hypertensive retinopathy. Moreover, the coexistence of left atrial enlargement and left ventricular hypertrophy was remarkable for the group of hypertensive patients with the most severe target organ damage. Therefore, measurement of LA size by echocardiography is a simple noninvasive method that may give additional information about the severity of hypertension. The finding of LA enlargement together with LVH may help in recognizing the group of hypertensive patients with the most severe target organ damage.

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Is Sexual Dysfunction in Hypertensive Women Uncommon or Understudied?

Sexual dysfunction is a recognized side effect of hypertension and antihypertensive medications in men, but has not been well established as a side effect in women, except by anecdotal report.^{1,2} The lack of research on women is clearly an inequity, since more U.S. women are hypertensive than are men.³ This article reviews the medical literature to ascertain whether the effects of antihypertensive medications on female sexual functioning are studied, to assess the current state of knowledge on this subject, and to test the hypothesis that women have been understudied in this regard. Of 268 articles found on the side effects of antihypertensives, 92 addressed sexual dysfunction. Nonsexual side effects were studied at similar rates for men and women; sexual dysfunction in women was studied markedly less. Since 1966, few primary research articles have addressed orgasmic impairment in women. No validated methodology to assess sexual dysfunction in women was found. This review identifies an area of research potentially important for improving quality of life and compliance with treatment among women with hypertension.

METHODS

A MEDLINE review of the medical literature (English language only) between 1966 and 1995 was conducted, limited to human studies on antihypertensive agents and their adverse effects by the following general search headings: chemically-induced psychosexual disorders and dysfunction, sex behavior, sex, quality of life, and sexual dysfunction. Abstracts of 268 articles identified were reviewed against preestablished inclusion criteria, which required the study to include examination of the effects of specific antihypertensive drugs on the quality of life, including effects on sexual function. An article was excluded if it was a letter or editorial, if the study had less than ten subjects, or if the authors were anonymous. Forty-one review articles and 68 primary research articles satisfied the inclusion criteria. Data were abstracted from each article, including name of journal, gender of authors (when possible), numbers of enrolled male and female subjects at the beginning and completion of each study, drugs and side effects studied, assessment of sexual dysfunction, including the method used, and