

# Can the Intensive Blood Pressure Control in Diabetes Reduce Left Ventricular Hypertrophy ?

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Left ventricular hypertrophy (LVH) is a common complication of hypertension and has been associated with higher risk for target-organ damage. Insulin resistance and type 2 diabetes mellitus (DM), myocardial infarction (MI), cardiomyopathy, coronary artery disease (CAD) is reported to be associated LVH [1-4].

LVH is a maladaptive response to chronic pressure overload and an important risk factor for atrial fibrillation, diastolic and systolic heart failure, and sudden death in patients with hypertension [5-7]. Echocardiographic assessment of LVH has a high specificity and sensitivity ( $\geq 80\%$ ). The presence of LV hypertrophy is often considered when LV mass  $>116 \text{ g/m}^2$  for men (M) and  $>104 \text{ g/m}^2$  for women (W), or  $>125 \text{ g/m}^2$  for M and W [7]. Factors promoting left ventricular hypertrophy are presented in Table 1.

LVH is a manifestation of preclinical cardiovascular disease, strongly predicts MI, stroke, and cardiovascular death in patients with hypertension or CAD [8,9]. In the Framingham Heart Study, electrocardiographic (ECG) evidence of LVH was associated with a twofold increase in mortality over that resulting from hypertension alone [10].

Soliman et al. [11] examined the effect of intensive (systolic BP  $<120 \text{ mm Hg}$ ), compared with standard (systolic BP  $<140 \text{ mm Hg}$ ), BP lowering on the risk of LVH in 4331 patients with diabetes mellitus. The outcome measures were electrocardiographic LVH defined by Cornell voltage (binary variable) and mean Cornell index (continuous variable). The prevalence of LVH (5.3% versus 5.4%;  $P=0.91$ ) and the mean Cornell index (1456 versus 1470  $\mu\text{V}$ ;  $P=0.45$ ) were similar in the intensive ( $n=2154$ ) and standard ( $n=2177$ ) BP-lowering. After median follow-up of 4.4 years, intensive, compared with standard, BP lowering was associated with a 39% lower risk of LVH (odds ratio (95% CI), 0.61(0.43, 0.88);  $P=0.008$ ) and a significantly lower adjusted mean Cornell index (1352 versus 1447  $\mu\text{V}$ ;  $P<0.001$ ). The lower risk of LVH is associated with more regression of baseline LVH and lower

rate of developing new LVH, compared with standard BP lowering. No interactions by age, sex, or race were observed.

This study provide evidence that a systolic BP of  $<120 \text{ mm Hg}$  when compared with  $<140 \text{ mm Hg}$  in patients with hypertension and DM produces a greater reduction in LVH.

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Hypertension	Insulin
Neurohumoral factors	Genetic influences
Angiotensin II	Growth factors
Aldosterone	Norepinephrine

Table 1: Factors promoting left ventricular hypertrophy.

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