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## **Prognostic value of serial electrocardiographic voltage and repolarization changes in essential hypertension: the HEART Survey study.**

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### **Abstract**

**BACKGROUND:** The interpretation of serial electrocardiographic (ECG) changes in hypertensive subjects is uncertain. We tested the hypothesis that serial changes in repolarization and voltage are independent determinants of outcome.

**METHODS:** The Hypertrophy at ECG And its Regression during Treatment (HEART) Survey was a prospective observational study performed at 61 centers. We studied 711 subjects with hypertension and ECG left-ventricular hypertrophy (LVH) at entry. Tracings from 496 subjects at entry and one or more visits during follow-up were available for central reading.

**RESULTS:** The prevalence of ECG LVH progressively decreased by 49.6% at 3 years. The crude rate of a prespecified primary composite end point of cardiovascular events was 4.17 per 100 subjects per year (95% confidence interval [CI], 3.27 to 5.33). We used Cox regression models of ECG LVH indexes as time-varying covariates at baseline and at follow-up. Time-varying LVH, defined as an absence of ST-T alterations ("strain"), was associated with a lower event rate hazard ratio (HR), 0.47; 95% CI, 0.28 to 0.78;  $P = .0035$ ), whereas the LVH changes defined in terms of ECG voltages did not achieve significance (HR, 0.91; 95% CI, 0.74 to 1.13;  $P = .39$ ). The crude event rate in subjects with versus without in-treatment ST-T alterations on the last available ECG before the event or before censoring was 8.38 versus 3.17 per 100 subjects per year ( $P < .0001$ ).

**CONCLUSIONS:** In this study of subjects with hypertension and ECG LVH at entry, serial changes in repolarization significantly predicted the prognosis, independent of voltage change (which was not significantly predictive in this study). The persistence or new development of ST-T alterations identifies subjects at very high risk of cardiovascular events.

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