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Electrocardiographic characteristics and metabolic risk factors associated with inappropriately high left ventricular mass in patients with electrocardiographic left ventricular hypertrophy: the LIFE Study.

Palmieri V, Okin PM, de Simone G, Bella JN, Wachtell K, Gerds E, Boman K, Nieminen MS, Dahlöf B, Devereux RB.

Weill Medical College of Cornell University, New York, NY 10021, USA.

Abstract

BACKGROUND: To investigate electrocardiographic (ECG) and metabolic abnormalities associated with left ventricular (LV) mass inappropriately high for workload and body size (termed 'inappropriate left ventricular mass'; ILVM) in hypertensive patients with ECG left ventricular hypertrophy (LVH).

METHODS: In patients enrolled in the Losartan Intervention for Endpoint Reduction (LIFE) Echocardiographic Substudy, LV structure and functions were assessed by echocardiography; Sokolow-Lyon and Cornell voltage, QRS duration, Cornell voltage-duration product and ST strain pattern in leads V5-V6 were evaluated on standard ECG tracings. ILVM was defined as observed LV mass greater than 128% of that predicted by sex, body size and stroke work.

RESULTS: In univariate analysis, compared with subjects with appropriate LV mass (n = 593), ILVM (n = 348) was associated with older age, diabetes, higher body mass index, lower systolic blood pressure, higher serum creatinine and urinary albumin/creatinine levels, higher LV mass index and greater prevalence of wall motion abnormalities (all P < 0.05). ILVM was associated with higher Cornell voltage and voltage-duration product but not higher Sokolow-Lyon voltage, with longer QRS and higher prevalences of ECG ST strain and echocardiographic wall motion abnormalities, independent of covariates including echocardiographically defined LVH or LV geometry. In separate logistic models, the likelihood of ILVM was significantly related to prolonged QRS duration, higher Cornell voltage, and greater Cornell voltage-duration independently (all P < 0.01).

CONCLUSION: In hypertensive patients with ECG LVH, ILVM was associated with prolonged QRS duration and higher Cornell voltage, with ECG ST strain pattern, and with echocardiographic wall motion abnormalities independent of traditionally defined LVH.

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