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Associations of Conventional Echocardiographic Measures with Incident Heart Failure and Mortality: The Chronic Renal Insufficiency Cohort

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Abstract

Background and objectives Heart failure is the most frequent cardiac complication of CKD. Left ventricular hypertrophy is common and develops early in CKD, but studies have not adequately evaluated the association of left ventricular mass index with heart failure incidence among men and women with CKD.

Design, setting, participants, & measurements We evaluated echocardiograms of 2567 participants without self-reported heart failure enrolled in the Chronic Renal Insufficiency Cohort Study. Two-dimensional echocardiograms were performed at the year 1 study visit and interpreted at a central core laboratory. Left ventricular mass index was calculated using the linear method, indexed to height^{2.7}, and analyzed using sex-specific quartiles. The primary outcomes of incident heart failure and all-cause mortality were adjudicated over a median of 6.6 (interquartile range, 5.7–7.6) years.

Results Among 2567 participants, 45% were women, and 54% were nonwhite race; mean (SD) age was 59±11 years old, and mean eGFR was 44±17 ml/min per 1.73 m². During a median follow-up period of 6.6 years, 262 participants developed heart failure, and 470 participants died. Compared with participants in the first quartile of left ventricular mass index, those in the highest quartile had higher rates of incident heart failure (hazard ratio, 3.96; 95% confidence interval, 1.96 to 8.02) and mortality (hazard ratio, 1.86; 95% confidence interval, 1.22 to 2.85), even after adjustment for B-type natriuretic peptide, troponin T, mineral metabolism markers, and other cardiovascular disease risk factors. Those in the lowest quartile of ejection fraction had higher rates of incident heart failure (hazard ratio, 3.01; 95% confidence interval, 1.94 to 4.67) but similar mortality rates (hazard ratio, 1.18; 95% confidence interval, 0.89 to 1.57) compared with those in the highest quartile. Diastolic dysfunction was not significantly associated with heart failure or death.

Conclusions Among persons with CKD and without history of cardiovascular disease, left ventricular mass index is strongly associated with incident heart failure, even after adjustment for major cardiovascular risk factors and biomarkers.

chronic kidney disease renal insufficiency, chronic epidemiology
Biomarkers Cardiovascular Diseases echocardiography Female
Follow-Up Studies heart failure Humans
Hypertrophy, Left Ventricular Incidence Male Minerals
Renal Insufficiency, Chronic risk factors Troponin T

« Previous | Next Article »
Table of Contents

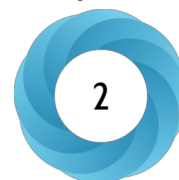
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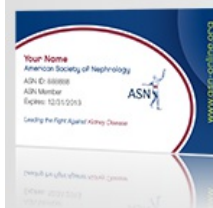
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