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ORIGINAL INVESTIGATIONS

Physical Activity and Mortality in Patients With Stable Coronary Heart Disease

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ABSTRACT

BACKGROUND Recommendations for physical activity in patients with stable coronary heart disease (CHD) are based on modest evidence.

OBJECTIVES The authors analyzed the association between self-reported exercise and mortality in patients with stable CHD.

METHODS A total of 15,486 patients from 39 countries with stable CHD who participated in the STABILITY (Stabilization of Atherosclerotic Plaque by Initiation of Darapladib Therapy) study completed questions at baseline on hours spent each week taking mild, moderate, and vigorous exercise. Associations between the volume of habitual exercise in metabolic equivalents of task hours/week and adverse outcomes during a median follow-up of 3.7 years were evaluated.

RESULTS A graded decrease in mortality occurred with increased habitual exercise that was steeper at lower compared with higher exercise levels. Doubling exercise volume was associated with lower all-cause mortality (unadjusted hazard ratio [HR]: 0.82; 95% confidence interval [CI]: 0.79 to 0.85; adjusting for covariates, HR: 0.90; 95% CI: 0.87 to 0.93). These associations were similar for cardiovascular mortality (unadjusted HR: 0.83; 95% CI: 0.80 to 0.87; adjusted HR: 0.92; 95% CI: 0.88 to 0.96), but myocardial infarction and stroke were not associated with exercise volume after adjusting for covariates. The association between decrease in mortality and greater physical activity was stronger in the subgroup of patients at higher risk estimated by the ABC-CHD (Age, Biomarkers, Clinical-Coronary Heart Disease) risk score (p for interaction = 0.0007).

CONCLUSIONS In patients with stable CHD, more physical activity was associated with lower mortality. The largest benefits occurred between sedentary patient groups and between those with the highest mortality risk. (J Am Coll Cardiol 2017;70:1689–700) © 2017 by the American College of Cardiology Foundation.

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ABBREVIATIONS AND ACRONYMS

CABG = coronary artery bypass graft

CHD = coronary heart disease

CI = confidence interval

CV = cardiovascular

eGFR = estimated glomerular filtration rate

HDL = high-density lipoprotein

HR = hazard ratio

LDL = low-density lipoprotein

METs = metabolic equivalents

MI = myocardial infarction

Clinical practice guidelines for prevention of cardiovascular (CV) disease recommend ≥150 min of moderate intensity or ≥60 to 75 min of vigorous exercise each week (1-3). Guidelines on secondary prevention of stable coronary heart disease (CHD) have recommended similar levels of regular moderate or vigorous exercise (4,5). These recommendations are based in part on studies that indicate cardiorespiratory fitness predicts mortality, and regular moderate or vigorous exercise improves physical fitness more than mild intensity exercise does (6). Most information on the relationship between physical activity and mortality comes from large general population studies (7-9). These studies suggest that there is a graded association between a combination of the intensity and duration of self-reported regular exercise and mortality, even at levels below those recommended in current guidelines (1-3). Milder intensity exercise, less sedentary time, and more time spent standing are also associated with lower mortality in general population cohorts (10,11).

Few studies have evaluated the potential benefits of lower intensity exercise in CHD populations, although several have evaluated more vigorous exercise (12,13). Runners with a history of myocardial infarction (MI) have lower mortality than nonrunners, but very high durations and intensities of running may increase CV risk (13). Randomized clinical trials of exercise training after MI suggest that increasing exercise lowers CV risk (14). However, these trials provide limited evidence on the importance of the intensity and duration of exercise interventions for prognosis; most studies were small, and reporting of exercise interventions was often poor (15).

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We analyzed relationships between the amount of mild, moderate, and vigorous physical activity assessed by self-reported questionnaire (16) and

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