Do Skeletal Fractures Decrease Risk for Subsequent Coronary Events in Women with Heart Disease?


Study Overview

Objective. To assess whether skeletal fractures affect subsequent risk of cardiovascular events in women with known coronary heart disease (CHD).

Design. Prospective cohort study (nested in a placebo-controlled clinical trial).

Setting and participants. Adult women with known heart disease enrolled in the Heart and Estrogen/progestin Replacement Study (HERS) recruited from 20 medical centers across the United States.

Main outcome measures. The primary outcome was a CHD event, defined as a nonfatal myocardial infarction (MI) or death due to heart disease. Secondary outcomes included nonfatal MI and CHD death individually as well as unstable angina, revascularization, and all-cause mortality.

Main results. Of the 2761 women enrolled, 361 women had a CHD event. Women with a fracture (either prior to enrollment or during the study) had a 25% lower risk of having a CHD event than women without fractures (hazard ratio [HR], 0.74 [95% confidence interval [CI], 0.57–0.96]; P = 0.02). After adjusting for covariates, including physical activity, body mass index, and other clinical factors that might be associated both with fractures and CHD events, there was still an independent association between skeletal fracture and the risk of subsequent CHD event (HR, 0.75 [95% CI, 0.57–0.98]; P = 0.04).

Conclusion. Postmenopausal women with heart disease who have had a skeletal fracture are at a decreased risk of another cardiac event compared with women who have had no fractures.

Commentary

CHD is the number one killer of American women [1]. Although some risk factors for CHD are well known (diabetes, hypertension), we continue to discover new risk factors. Several studies have suggested that low bone mineral density has been associated with increased risk of cardiovascular mortality [2,3]. Spine fractures, a consequence of low bone mineral density, have also been associated with increased risk of cardiovascular mortality. However, whether nonspine skeletal fractures increase risk of cardiovascular events has not been studied.

The authors found that women with an incident fracture were at decreased risk of cardiovascular events. This was a surprising finding, as the authors had expected that fractures would increase the risk of cardiovascular events. The P value of 0.02 for the main result suggests that it is unlikely that the association observed was due to chance alone.

The study had a number of strengths. Follow-up for all women was high and was the same for women with and without fractures, reducing the likelihood of bias. In addition, the authors adjusted for multiple covariates that are close surrogates of overall well-being, including physical activity level and comorbidities. However, these only partly adjust for women’s well-being and may not fully account for this issue.

While previous studies have suggested that low bone mineral density and spine fractures were associated with subsequent cardiovascular events [2], it is possible that this relationship does not exist for skeletal fractures and that skeletal fractures may be physiologically different than spinal fractures. This issue requires further study.

Applications for Clinical Practice

Varosy and colleagues have conducted a thought-provoking study, but its clinical applications are unclear. One important contribution of this study is that it highlights the potential links between bone mineral density, osteoporosis, and risk of cardiovascular disease. While it is unlikely that fractures truly reduce the risk of cardiovascular outcomes, the relationship between bone health and cardiovascular health is an area that clinicians need to understand better.

—Review by Ashish K. Jha, MD
References