Letters

TO THE EDITOR

The Importance of Ventricular-Vascular Uncoupling

We read with pleasure the interesting report by Pfister et al. (1). There in an expanding body of evidence in published reports showing an inverse relationship between bone and vascular health. Schulz et al. (2) showed that the extent of aortic calcification is inversely proportional to bone mineral density (BMD) of the spine in post-menopausal women. Bolland et al. published a subanalysis of a randomized trial and a meta-analysis showing that calcium supplements for healthy post-menopausal women do not substantially increase BMD but may increase the rate of myocardial infarction and stroke (3,4). There is one potential mechanism not considered by Pfister et al. (1) that may be subtending the development of concurrent heart failure in patients with low BMD: the myocardial-vascular uncoupling that occurs with aging even in the absence of coronary artery disease. Our group has had an interest in vascular calcification and vascular stiffness for several years. In a cohort of prevalent hemodialysis patients, who have a particularly high risk of developing vascular calcifications, congestive heart failure, and sudden death, we showed that increased aortic stiffness is associated with low vertebral BMD (5). Other investigators have shown that increased aortic stiffness leads to left ventricular hypertrophy and diastolic dysfunction and, eventually, systolic dysfunction. Similar mechanisms may be operative in patients with normal renal function on the basis of aging and progressive replacement of elastic fibers with collagenous fibers in the media and adventitia of the arterial wall. Thus, we believe that the discussion of the report by Pfister et al. (1) would have benefited from mention of these aspects of myocardial/vascular/bone health uncoupling.

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REFERENCES


REPLY: The Importance of Ventricular-Vascular Uncoupling

In their letter, Drs. Raggi and Bellasi propose myocardial-vascular uncoupling as a potential mechanism underlying the association between low bone mineral density and risk of heart failure as observed in our study (1). In the EPIC (European Prospective Investigation Into Cancer and Nutrition)-Norfolk Prospective Study, measures of vascular calcification or aortic stiffness were not available to examine the proposed mechanism. However, the correlation of pulse wave velocity as a measure of aortic stiffness and bone mineral density in patients on hemodialysis, as reported by Drs. Raggi and Bellasi, might not be generalizable to elderly and otherwise healthy subjects in the population. Vascular calcification and stiffness in patients on hemodialysis is excessive, as indicated by an almost 2-fold higher pulse wave velocity in these patients compared with elderly subjects in the general population (2,3). Furthermore, there seems to be a striking sex divergence in the association between pulse wave velocity and bone mineral density and also between pulse wave velocity and diastolic dysfunction, with a significant association observed only in women (2,4). In contrast, we did not observe a