A critical appraisal on the association and effects of magnesium and bone density on physical performance in elderly women

Dear Editor:

Veronese et al. (1) recently published an article entitled "Effect of oral magnesium supplementation on physical performance in healthy elderly women involved in a weekly exercise program: a randomized controlled trial" in a recent issue of the Journal.

This parallel-group trial aimed to evaluate oral supplementation of magnesium oxide for 12 wk and to observe its effects on the physical performance of healthy elderly women. The women were evaluated during a conditioned physical program, the Short Physical Performance Battery. In addition, muscular strength tests using a dynamometer, several urine and blood tests, body composition, and surveys on eating frequency and physical activity were evaluated. The positive results related to magnesium on physical performance are encouraging and highlight the need for magnesium supplementation in women of this age, especially among those with clear documented magnesium deficiencies.

Even though this article nicely evaluates and reports all of the relevant aspects mentioned above, we think it would also benefit by reporting on the importance of bone density measurement, which is a relevant aspect of physical performance assessment. In this regard, the measurement of bone mineral density (BMD) has been proven in some studies to correlate well with physical performance. In one study (2), physical performance was measured through normal and brisk 8-m gait speed, normal and brisk step length, time 1-leg stance, timed sit-to-stand, and grip strength tests. The results showed that people with longer step lengths and faster normal and brisk gait speeds had higher BMD level throughout the body.

In addition, another study (3) examined the association of grip strength with bone density at distant sites, such as the spine and hip, as well as at the wrist and distal radius in postmenopausal women. As a result, overweight women had significantly stronger grip strength in both hands, and women who exercised had significant associations of grip strength with BMD (3). It is important to highlight that both studies were conducted in elderly women, similar to the study by Veronese et al. (1). From this evidence we can argue that bone density is an important cofactor related to physical performance in this specific population.

Given this, it would also be worthwhile to further explore and report whether magnesium would also help to increase or maintain bone density in women in this age range, therefore providing evidence for bone density to be a mediator, likely one of many others, between magnesium consumption and physical performance. In another study, Orchard et al. (4) found that low consumption of magnesium (<206.5 mg/d) was associated with lower whole-body BMD in comparison with the group who consumed more magnesium in their diet (>422.5 mg/d). Second, after a dietary and supplementation assessment conducted by Ryder et al. (5), it was concluded that higher consumption of magnesium (increase of 100 mg/d) resulted in an increase of 2% in whole-body BMD in older women.

Magnesium, together with other micronutrients, is needed for bone health. A study using 12 mo of continuous supplementation showed that healthy individuals with osteopenia increased their BMD. Here, magnesium, with other micronutrients, demonstrated more effects than did other compounds such as bisphosphonate or strontium ranelate (6).

Given the above, it is important to consider the reporting of bone density related to physical performance indicators when assessing the effects of or associations with magnesium. There is a lack of information about the association between magnesium, BMD, and physical performance in older women. It was noted in the main study (1) that bone density was measured; however, the results are not mentioned. We found in the previously described studies that magnesium may have a relevant role in bone strength, and therefore in physical performance.

Such information, if available, would greatly contribute to the field and to a better understanding of magnesium metabolism and its physiologic mechanisms of action in physical performance.

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