CORRESPONDENCE

Fracture Risk and Risk Factors for Osteoporosis

Results from Two Representative Population-Based Studies in North East Germany (Study of Health in Pomerania: SHIP-2 and SHIP-Trend)

by Christian Schürer, Dr. med. Henri Wallaschofski, Prof. Dr. med. Matthias Nauck, Prof. Dr. med. Henry Völzke, Prof. Dr. med. Hans-Christof Schober, and Dr. rer. med. Anke Hannemann in issue 21–22/2015

Account for Increased Fat Mass

With regard to risk factors for osteoporosis, I would like to point out (1) that obesity, while having a positive effect on fractures, such as hip, pelvic and wrist fractures, is associated with an increased risk of ankle, lower leg and proximal humeral fractures in postmenopausal women (2). The pathogenic mechanisms possibly underlying this association between obesity and fracture include, among others, increased production of pro-inflammatory cytokines (interleukin-6, tumor necrosis factor alpha), insulin resistance, an increased tendency to fall, restricted muscular mobility, co-morbidities (such as asthma, diabetes mellitus, metabolic syndrome), hypogonadism, calcium malabsorption, and reduced plasma levels of 25-hydroxyvitamin D in obese persons (2, 3). Therefore, further data analyses assessing modifiable risk factors of osteoporosis in Germany should include increased fat mass in the study population in addition to underweight.

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Conflict of interest statement

The author declares that no conflict of interest exists.

Slightly Distorted Impression

I congratulate Schürer et al. on their work; a radiation-free and readily available method for osteoporosis screening or assessment of the risk of fracture is an important aspect of technological innovation in this field (1).

However, I think that the authors overestimate the current level of validation of the chosen technique in their “Discussion” and in the “Strengths and limitations of the study” sections, thus running the risk that the reader may get a slightly distorted view.

Apart from a few older studies on validity, focusing mainly on device-specific, country-specific and population-specific threshold values, a recently published Danish review (2) found that thus far no consensus exists on the threshold values for diagnosing or ruling out osteoporosis. Perhaps, the authors should add this aspect to their “Strengths and limitations of the study” section.

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In Reply:

Underweight and malnutrition are important risk factors for the development of osteoporosis. Especially in adolescents, they cause significant harm by reducing the maximum bone mass achieved. As highlighted by Dr. Hofmeister, increasing evidence from studies has become available over the last years showing that obesity, too, has a negative impact on bone quality.

In fact, it would be good to find out whether an increase in fat mass, especially morbid obesity, is associated with an increased risk of ankle fractures, lower leg fractures or proximal humeral fractures.

We will gladly take up this suggestion for future data analyses. In the current study, this was not possible as the number of cases was too low. In earlier studies, we have already evaluated the relationship between body mass index, waist circumference, visceral and subcutaneous fat mass, and the stiffness index, as well as vitamin D serum levels (1, 2). These analyses revealed positive linear associations between anthropometric measures and the stiffness index (1). No reduction in stiffness index was detected with increasing body mass index and fat mass, respectively. In contrast, an inverse association between these anthropometric measures and vitamin D levels was found (2).

We would also like to thank PD Dr. Birkenmaier for his comment. As mentioned in the discussion section, the results of our quantitative ultrasound (QUS) measurements of the calcaneus, including the stiffness index and the risk of osteoporotic fracture, are not identical with the clinical diagnosis of osteoporosis (3).

In clinical practice, dual-energy X-ray absorptiometry (DXA) is the accepted gold standard, whereas QUS measurements are recommended only in exceptional cases for the initial diagnosis (4).

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Conflict of interest statement

Dr. Wallaschofski has received lecture fees for lectures on “biomarkers of bone metabolism” from Amgen und Lilly.

Dr. Hannemann declares that no conflict of interest exists.