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Standardising the descriptive epidemiology of osteoporosis: recommendations from the Epidemiology and Quality of Life Working Group of IOF

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Abstract

Summary—The Committee of Scientific Advisors of International Osteoporosis Foundation (IOF) recommends that papers describing the descriptive epidemiology of osteoporosis using bone mineral density (BMD) at the femoral neck include T-scores derived from an international reference standard.

Introduction—The prevalence of osteoporosis as defined by the T-score is inconsistently reported in the literature which makes comparisons between studies problematic.

Methods—The Epidemiology and Quality of Life Working Group of IOF convened to make its recommendations and endorsement sought thereafter from the Committee of Scientific Advisors of IOF.

Results—The Committee of Scientific Advisors of IOF recommends that papers describing the descriptive epidemiology of osteoporosis using BMD at the femoral neck include T-scores derived from the National Health and Nutrition Examination Survey III reference database for femoral neck measurements in Caucasian women aged 20–29 years.

Conclusions—It is expected that the use of the reference standard will help resolve difficulties in the comparison of results between studies and the comparative assessment of new technologies.

Keywords

BMD; Descriptive epidemiology; Femoral neck; Osteoporosis

Very many studies have examined the age- and sex-specific differences in bone mineral density (BMD) in many countries in order to characterise country-specific norms and to document the prevalence of osteoporosis as defined by the T-score using the WHO criteria originally established in 1994 [1, 2]. Since 1994, the WHO has updated and clarified the operational description of osteoporosis [3]. This arises because of the many new technologies that had been developed for the measurement of bone minerals at multiple skeletal sites, with the result that the information provided by each assessment described differently the clinical characteristics, fracture risk and epidemiology of osteoporosis [4]. Against this background, there was a need for a reference standard for describing osteoporosis.

In the absence of a true gold standard, the WHO proposed that the reference standard should be based on BMD measurement made at the femoral neck with dual-energy X-ray absorptiometry (DXA). This site has been the most extensively validated and provides a gradient of fracture risk as high as or higher than that of many other techniques. The recommended reference range was the National Health and Nutrition Examination Survey (NHANES) III reference database for femoral neck measurements in Caucasian women aged 20–29 years [5]. This proposal has been endorsed by many international agencies

including the International Osteoporosis Foundation (IOF), the International Society for Clinical Densitometry, the European Society for Clinical and Economic Aspects of Osteoporosis and Osteoarthritis (ESCEO). More controversially, a similar threshold value for femoral neck BMD that is used to define osteoporosis in women was proposed for the diagnosis of osteoporosis in men—namely, a value for BMD 2.5 SD or more below the average for young adult women [6].

The adoption of DXA as a reference standard with a defined normal range provides a platform on which the performance characteristics of less well established and new methodologies can be compared. It also permits international comparisons to be made between countries. A limitation of many studies to date that describe the prevalence of osteoporosis is that the derivation of the T-score is not given. Even when given, the BMD values on which T-scores are based are not consistently provided. This results in difficulties in comparing the prevalence of osteoporosis in different regions of the world and its relation to fracture outcomes.

Although osteoporosis may be clinically diagnosed using BMD measurements at multiple sites (lumbar spine, total hip or femoral neck), the Epidemiology and Quality of Life Working Group of the IOF recommends that studies of the descriptive epidemiology of osteoporosis include measurements made at the femoral neck and report T-scores or diagnostic categories derived from standardised measurements using the NHANES III reference base for Caucasian women. The recommendation, endorsed by the Committee of Scientific Advisors of the IOF and the Scientific Advisory Board of ESCEO, is not intended to be restrictive. Authors should feel free to continue to use local reference values and T-scores where appropriate, but at the same time, the additional information will allow greater opportunity for international comparison.

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