Reviewer's report

Title: Discordance in diagnosis of osteoporosis using spine and hip bone densitometry

Version: 1 Date: 23 November 2004

Reviewer: Florent Richy

Reviewer's report:

General
This is an interesting manuscript by Moayyeri and colleagues. It aims at documenting the discrepancies observed in the WHO bone mineral density classification (normal, osteopenia, osteoporosis) depending on the measured site (hip or lumbar area). Differences as high as 40% were observed and some predictors were identified using univariate approaches. While I find the paper well written, I feel it requires several alterations before it can be considered for publication.

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Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

- My first concern is on reference values and measurement precision. As indirectly mentioned in the manuscript (via the WHO thresholds), their inappropriate choice may generate discordances between hip and lumbar T-scores since they are not specific of the considered population. What normative dataset have the authors been using? My experience is that, using nonappropriate reference values for men can lead to artefactual variations as high as 220% at the hip level and 160% at the lumbar level. This major confounder should be acknowledged. The precision of the DXA technique is stated in the "methods" section. However, it was not included in the prevalence calculations. Using, for instance, 95% confidence intervals around prevalence estimates would allow for it.

- The current guidelines of the US Preventive Services Task Force on Osteoporosis Screening state that the likelihood of being diagnosed with osteoporosis varies greatly depending on the site and type of bone measurement test, the number of sites tested, the brand of densitometer used, and the relevance of the reference range. Among different bone measurement tests performed at various anatomic sites, bone density measured at the femoral neck by dual-energy x-ray absorptiometry is the best predictor of hip fracture and is comparable to forearm measurements for predicting fractures at other sites. I have the feeling that more credit should be given to this particular aspect in this study. Indeed, since hip fractures have the highest impact on mortality, quality of life, direct and indirect costs, most of the measurements taken in a screening campaign may be focused on the hip BMD. The authors should try to further investigate the predictive value of a normal hip BMD on a normal or pathologic lumbar BMD (major discordance) and resulting fractures, since in many European countries the reimbursement of osteoporosis treatments is based on a T-score <-2.5 at the hip level.

- The authors should implement a multivariate regression of discordance against independent outcomes (age, sex, menopause, HRT, BMI, etc.). I am sorry I find the analysis too restricted in its present state to warrant a clear understanding for the reader. Using a simple logistic model would allow for adjusting covariates and extracting the remaining significant ones. This approach would provide the reader more accurate predictors of discordance depending on a patient's characteristics.

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Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

The text is well written and the authors have to be commented for this.
Page 6, last para. The sentence "BMI of participants with major or minor discordance who had poorer lumbar diagnoses was significantly higher than others (28.9 ± 19.7 versus 27.7 ± 18.6, P = 0.048)." should be reworded.

Discretionary Revisions (which the author can choose to ignore)

As stated above, I would be interested in having an overview of the 10 years projection of hip and lumbar fractures (according to Kanis probabilities, for instance) depending on the strategy: DXA measurement at hip and L2-L4; only at hip; only at L2-L4. I guess this would illustrate your conclusions in a more pragmatic way.

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

Level of interest: An article of importance in its field

Quality of written English: Needs some language corrections before being published

Statistical review: Yes

Declaration of competing interests:

I declare that I have no competing interests