Reviewer’s report

Title: Quantitative ultrasound is a useful tool to survey osteoporosis in a community without dual-energy x-ray absorptiometry

Version: 3 Date: 10 October 2005

Reviewer: Michelle L Frost

Reviewer’s report:

General

This is a large cross-sectional community-based study of over 6,000 subjects aimed at assessing the prevalence of osteoporosis in Taiwan using calcaneal quantitative ultrasound. This is an important study as this community do not access to DXA and therefore QUS offers an attractive alternative for screening to identify those people at risk of fracture. The main aim of the study was to estimate the prevalence of osteoporosis using the WHO criteria of a T-score <-2.5. It has been reported by others that this T-score threshold of -2.5 for defining osteoporosis cannot be applied to QUS measurements. To fully address this both DXA and QUS measurements should be performed on the same subjects. However this was not done in the present study and the conclusions are based on comparisons made with other published papers in the literature. The other important issue is that reference data for both male and female subjects aged 20-29 were pooled to estimate the young adult mean and SD required to calculate T-scores. It would be better to either calculate the mean and SD for male and female subjects separately (especially if the results for male and female subjects are significantly different) or use data for female subjects only.

-------------------------------------------------------------------------------

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

1. The methods and results section of the abstract need to be improved so it is clear what the main findings of the study are without having to read the entire paper e.g. it has not been stated that the 166 subjects aged 20-29 years were used to calculate the young adult mean and SD, the odds ratios of what? Was the age-related decrease in BUA?
2. The term ‘equivalent osteoporosis’ used throughout the manuscript is vague and slightly misleading, particularly in the abstract where it has been described as ‘low QUS values’. It should be made clear that individuals were said to have osteoporosis if they had a BUA T-score of <-2.5.
3. The reference data for both male and female subjects aged 20-29 has been pooled to estimate the young adult mean and SD required to calculate T-scores. It would be better to either calculate the mean and SD for male and female subjects separately or use data for female subjects only.
4. The conclusions in the abstract and main paper are vague and do not include a summary of the main findings.

-------------------------------------------------------------------------------

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

1. Page 7, final paragraph. Did the daily QC measurements show that the QUS devices were stable during the study period? Were there any signs of instrumental drift or calibration shifts?
2. In addition to looking at the correlation between the two QUS-2 devices used it is important to also examine the data using a Bland-Altman plot to see if there were any systematic differences between
the 2 devices that cannot be determined from simple correlations.

3. Page 8, final sentence of second paragraph. Was the correlation observed between femoral neck BMD SIGNIFICANTLY greater than that observed between f.neck and lumbar spine BMD, if not the statement of a ‘better correlation’ should be removed.

4. Page 9, Statistics section. It should be made clear that the odds ration is the increased risk of having osteoporosis with each increase in 10 years of age – if this is indeed what it is as it is difficult to work out from reading the manuscript!

5. Page 10, second paragraph, sentence beginning ‘The relationship of BUA to age …’ this should refer to Figure 2 not Figure 1.

6. The annual rate of decrease in BUA for females and males should be stated in the results section on page 10.

7. Figure 2 – please plot the data for female and male subjects separately.

8. Table 1 – the data for young adult subjects aged 20-29 years should be included here.

Discretionary Revisions (which the author can choose to ignore)

**What next?:** Accept after minor essential revisions

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No

**Declaration of competing interests:**

I declare that I have no competing interests.