Author's response to reviews

Title: Factors Influencing Diagnosis and Treatment of Osteoporosis after a Fragility Fracture among Postmenopausal Women in Asian Countries: a Retrospective Study

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Author's response to reviews: see over
Dear Editor and Reviewers,

Thank you and reviewers for all the comments to help improve our manuscript. Please see below the point-to-point response to reviewers' comments.

Also a revised version of the manuscript are submitted to the [http://www.biomedcentral.com/](http://www.biomedcentral.com/)

Please feel free to contact me for any questions or further request. And look forward to the final decision.

Best regards,

Tao Fan

**Reviewer 1**

*Reviewer's comments:*

This study uses a review of medical charts and an interview with the patient in order to establish the practice patterns of managing osteoporosis in an Asian population of postmenopausal women who have had a hip fragility fracture. The fact that only 13.2% answered yes to "history of fragility fracture" despite the fact that all the patients were admitted for hip fragility fracture cast doubt on the accuracy of the patients' responses. If this question had been about a history of fragility fracture before the patients' admissions for hip fragility fracture, I do not see how this history would be relevant since they all subsequently had hip fragility fractures. Therefore, the conclusions in relation to the history of hip fracture cannot hold ground.

**Responses to reviewer:**

It is correct that only patients with hip fracture were recruited in this study. And every patient had a fracture event that was used to identify patients, which was defined as "index fracture". However, in the patient's questionnaire, patients were asked about fracture history prior to the index fracture (the pre-index fractures).

Here please note that index fractures and pre-index fractures captured different clinical information. Patients without pre-index fractures only had one, and the 1st fragility fracture. While those with pre-index fractures were patients with repeated fragility fractures usually have more severe osteoporosis and more urgent need to receive treatments to reverse bone resorption.
Overall, pre-index fractures was important prognosis information to help treating doctors to confirm the diagnosis of osteoporosis and treatment decisions.

Reviewer's comments:

The results in the text and the tables do not tally. In the text, it is stated that 13.2% had a history of fragility fractures; in the table it is 16.1%.

Responses to reviewer:

Corrected. Page 5, paragraph 4:

"Patient characteristics are presented in Table 1. The mean (SD) age was 72.9 (11.5) years. A history of fragility fracture was recorded in 16.1% of patients,..."

Are the types of payment options standard across the different countries? Otherwise, there might be bias. Could this be the reason why Table 3 shows that there are various associations between payment options and the outcome measures which may be difficult to explain, eg: 100% social insurance is associated with lower OR of having osteoporosis medication, versus other type of insurance is associated with higher OR of having osteoporosis medication.

Responses to reviewer:

The type of payment questionnaire used a set up of standard choice questions across different countries, ranging from 100% self pay, 100% private insurance, 100% social insurance, to partially by insurance, or 100% free hospital care. Patients in different countries have standard and limited choice answers to this question. The purpose of this question is to measure the barrier to bisphosphonates due to economic reasons. It turned out that having insurance increases the chance of receiving bisphosphonates significantly versus the situation of 100% self pay. Of course we agree this is very challenging topic; and this question alone will not be able to capture all the details in the health insurance policy across different countries, e.g., the coverage and proportion of coverage in social insurance vs. private insurance. Therefore we believe the results reflected that social insurance has less generous coverage or higher co-payment. However, the detailed discussion about relationship between health insurance and medication treatments would be beyond the scope of this study.

Again, the accuracy of this survey method is questionable as illuminated by: 316 patients answered that they have had a BMD measurement, whereas Table 4
shows only 256 patients factually had a BMD. The exclusion of patients who did not answer may introduce bias.

Responses to reviewer:

To clarify, 316 patient reported that they received BMD scan; however, only 256 patients reported actual values of BMD and included in the analyses in table 4.

Since BMD data are not a routinely collected clinical data. BMD data are not available for a proportion of patients. Therefore, the best approach to deal with BMD data is not to treat it a required independent variable in the primary analyses, which is to describe the treatment and diagnosis pattern and identify factors influencing treatments. However, to evaluate the potential impact of BMD data on treatment choices, patients who actually reported BMD data were analyzed in a subgroup analysis (results in table 4). It is a sensitivity analyses for patients with actual BMD values. And therefore it will not bias the primary data analyses.

Reviewer 2

Were all patients treated for fragility hip fractures for the duration of the study time evaluated?

Responses to reviewer:

All eligible patients during the study period were evaluated.

Is 1148 the total number of patients that were identified or is this the “random sample” as described previously?

Responses to reviewer:

It was a random sample of all eligible patients from participating centers during the study window period. The sample size was pre-determined.

Is this any previous fragility fracture or a previous hip fracture (page 5, paragraph 4)

Responses to reviewer:
Pre-index fracture. This sentence was amended as: "A history of fragility fracture prior to the hip fracture was recorded in 16.1% of patients, 52.9% had hypertension and 29.3% had diabetes." In page 5, paragraph 4.

What percentage of these BMD estimations were done before the hip fracture and what following the fracture

Responses to reviewer:

This analyses focus on BMD screening before the hip fracture. Edits made to the text.