Author's response to reviews

Title: At the moment of occurrence of a fragility hip fracture, men have higher mechanical properties values in comparison with women

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Author's response to reviews: see over
Reviewer's report

Title: At the moment of occurrence of a fragility hip fracture, men have higher mechanical properties values in comparison with women

Version: 2 Date: 16 June 2013

Reviewer: Joop P van den Bergh

We thank the reviewer for the comments/questions that helped us to improve the paper. Changes are made in orange in the text.

Reviewer's report:
The article is substantially improved.

There is one issue that needs to be addressed further. The authors mention at line 1, page 11 that lower bone ultimate stress was observed in the oldest group. However, in table 2 the lowest value is found in the youngest age group, although there is no significant difference overall between the three age groups. We apologize for the mistake. In fact, the ultimate stress does not significantly changes with age (p=0.163).

That part of the text was re-written:
“Regarding age effects, a decrease in the Young’s modulus and an increase in the energy to failure were detected, while the ultimate stress was almost constant.”

However, Energy to failure is highest in the oldest group (table 2) and additionally the spearman’s rho shows a significant positive correlation. The energy to failure is statistically different for the three age groups and tends to increase with age. This is compatible with the rest of the data of table 2. With age, while the ultimate stress is almost constant, there is a decrease in the slope of the stress-strain curve, i.e., in the Young’s modulus, which implies that the strain must be higher. Thus, a decrease in the modulus, keeping the ultimate stress constant, originates a larger area under the curve, that is, a larger energy to failure.

How do the authors explain a higher energy to failure with age and no difference (or maybe a modest increase) in Ultimate stress with age, while the opposite should be expected namely a decrease of the ultimate stress and energy to failure with increasing age?
We also expected that the ultimate stress and the energy to failure would decrease with increasing age. A new sentence was added:

“These results are unexpected, as for example, Wang et al. [42] report that age-dependent changes are reflected in a decreased strength, elastic modulus and work to fracture. However, our age interval is considerably narrow which may have biased that effect.”