Reviewer's report

Title: Differences in osteogenic and apoptotic genes between osteoporotic and osteoarthritic patients

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Reviewer: Jose Manuel Quesada Gomez

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- Major Compulsory Revisions

In the introduction, I think the authors should justify in greater depth, since they do a study of genes involved in apoptosis. They should also explain why they perform microstructural and biomechanical studies on trabecular bone characteristics in these patients.

Material and methods shows that osteoporotic patients are older than osteoarthritic patients (with an average difference of ten years). It is also remarkable that fractured osteoporotic patients had suffered their fractures just before the study. This might influence the results. These facts should be considered in the discussion by the authors.

The results obtained with the array of osteogenesis genes seem to me somewhat conclusive and within the expected. In the array of apoptotic genes, I miss some further analysis focused on the assessment of the differences found in the relation between apoptotic / antiapoptotic genes.

This is because I understand that most genes decrease in OP patients. However, whether antiapoptotic genes decline further than apoptotic genes, an apoptosis increase should be expected. Concerning this issue, as the authors mention in the discussion, some of the studied apoptotic genes are related to inflammatory responses, which may be stressed in osteoarthritic patients.

For the validation of the arrays results, I find it very scarce to test only one gene from each array. Authors should justify this. I think that additional genes should have been evaluated. Besides, I do not fully understand why, as for the PCR array, the authors use #-actin to normalize; whereas, to perform the RT-PCR, they use the 18S rRNA gene for validation. I think it would have been a more logical approach to normalize with the same housekeeping gene (they should also justify it).

The authors of the manuscript should also include both limitations and strengths of the study.

In short, the work seems very attractive to me; and once reviewed by the authors, it would be suitable for publication.

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests