Reviewer’s report

Title: Empirical evaluation of the inter-relationship of articular elements in the pathogenesis of knee osteoarthritis using Magnetic Resonance Imaging

Version: 1 Date: 26 May 2009

Reviewer: Grace Lo

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Major compulsory comments:
The authors have articulated their question as being that cartilage damage would be associated with the number of articular features that are damaged as well as with the severity of damage of those features. However, until reading final sentence on page 3, it is unclear why the authors are interested in this question. There should be more of a set up for this question in the introduction. Why is it expected that damage occurs in parallel in OA as opposed to sequentially?

Also, the scoring system used in this study is very confusing. Figure 1 in particular, is intended to address this point, but this figure is also very confusing. If the focus of this paper is on looking how the scales of knee OA abnormalities are associated with one another, then the greater detail of the description of those features should be included in this paper. Also, while many of the features included in this study are commonly read on MRIs, it would make sense to clarify the definition of each of the features – in particular, subchondral sclerosis needs to be defined. This feature has not frequently been read off MRIs – it is usually read using X-rays. Furthermore, many of the scores have been performed using absolute scales (e.g. cut offs using cm measurements). This seems to be potentially problematic if the individuals included in the study vary in size. For instance, a BML of 3mm in a 6 foot tall male is probably different from a BML of 3mm in a 5 foot tall female. Is there some mechanism for normalization of these measures? Also, the cut-offs for many of the features seems arbitrary – especially for articular cartilage. It almost seems that these cut-offs could have been chosen to maximize the differences seen in this study. It would help if there were a validation study population available to confirm these findings using these definitions.

The authors conclude that these study results support that OA pathogenesis involves all articular elements of the knee. It is unclear how the findings of this study support this conclusion. This study shows that individuals with greater cartilage damage are more likely to have multiple other features that are damaged in a cross-sectional assessment. It is unclear how this finding can be extrapolated into these authors conclusion.

While the discussion section of this study describes some of the existing literature regarding MRI findings, this section seems particular disjointed – the paragraphs do not seem to flow together.
Minor essential comments:
WORMS and BLOKS were never intended to be used as an aggregate score as suggested by these authors on page 3, paragraph 1.
Portions of the methods are included in the results section – particularly bottom of page 8-top of page 9.
Figure 2 is very confusing. It is unclear how to interpret this table. Please clarify.

Level of interest: An article of limited interest

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