Reviewer's report

Title: Effect of hyperbaric oxygen on mesenchymal stem cells for lumbar fusion in vivo

Version: 1 Date: 21 October 2009

Reviewer: Hicham Drissi

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In this manuscript, Fu and colleagues investigated the effects of hyperbaric oxygen (HBO) treatment of mesenchymal progenitor cells on spinal fusion using alginate carriers. The authors used radiographic examination, hand palpation and histological assessments to show that while unions were observed in approximately 50% of their experimental groups which received MCS-loaded alginate, no significant differences were observed between HBO treated and untreated cells. This is a potentially interesting study which attempts to define the importance of HBO treatment for spinal fusion. However, the authors need to address the following points.

A difference between the experimental groups is not justified. The authors need to perform a rigorous power analysis for proper statistical significance.

It is not clear what is the percentage of the transplanted cells that partly contribute to union.

If the host cells are primarily responsible for contributing to fusion, how do the authors explain the 50% failure rate in each group regardless of HBO treatment?

Micro-CT analyses should provide a quantitative outcome to the observed changes.

Are the HBO treated and non-treated groups showing the same bone quality. Providing mechanical testing would greatly enhance the quality of this study.

Level of interest: An article of limited interest

Quality of written English: Needs some language corrections before being published

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

No to all the above.
'I declare that I have no competing interests'