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Letter to the Editor

Stem cells for cartilage repair: what exactly were used for treatment, cultured adipose-derived stem cells or the unexpanded stromal vascular fraction?

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Dear Editors,

We read with interest the recent article entitled "*Assessment of clinical and MRI outcomes after mesenchymal stem cell implantation in patients with knee osteoarthritis: a prospective study*" by Kim *et al.* In this paper, the authors have concluded that the use of mesenchymal stem cells (MSCs) to repair cartilage lesions is feasible as demonstrated by their clinical and MRI data.

We noticed, however, that the authors misreported the fraction they used for their therapy. According to the joint statement of the International Federation for Adipose Therapeutics and Science (IFATS) and the International Society for Cellular Therapy (ISCT), the pellet obtained after subjecting the adipose tissue to enzymatic digestion (usually collagenase), filtration and subsequently separated further from the mature adipocytes through centrifugation is referred to as the heterogeneous stromal vascular fraction (SVF) with the adipose-derived stem cells (ASCs) as among the subset of cells within the SVF. The ASCs identity can be verified when cultured as they are plastic-adherent, exhibit multi-potency and express specific surface markers[1]. Several terms have been used to identify these adherent cells and in support to the consensus reached by IFATS to unify the term[2] we will call the MSCs referred to in this article as ASCs. Likewise, we encourage the authors to use the same.

In the methods section the authors stated "*we aimed to collect 140 cc liposuctioned adipose tissue: 120 cc was used for implantation and the remaining 20 cc was analyzed to examine the plastic adherent cells that form the fibroblast colony forming units (CFU-F) and confirm the mutilineage differentiation of adipose-derived stem cells*". There is no other way this can be understood but to mean that the adipose tissue collected were divided into two portions. One portion was used for transplantation and upon review of their procedure which was adapted from Zuk *et al.*[3], this clearly was the unexpanded SVF. Although they were successful in showing that adherent cells upon culture were indeed ASCs by using another portion of the collected adipose tissue, this does not necessarily mean that the SVF works the same way as when using the expanded ASCs cultured from the SVF. The uncultured ASCs in the SVF when characterized according to their surface markers have different phenotypes compared with cultured ASCs[4].

Also, in the methods section particularly on describing their surgical technique, the authors acknowledged that the SVF was used as they wrote "*first, the cell suspension (stromal vascular fraction cells containing MSCs) was loaded into the thrombin solution in a 1:1 mixture ratio*" but later in the paragraph they refer this suspension wholly as stem cells when they wrote "*implantation of this cell thrombin-fibrinogen suspension (i.e., MSCs mixed with fibrin glue) under arthroscopic guidance after the arthroscopic fluid was extracted*". The term stem cell was reflected in the title and the abstract with no reference to the SVF which is incorrect and will confuse the readers and patients.

Researches, reviewers and editors are encouraged to look closely at the true identity of the cells using the characteristics put forward through the IFATS and ISCT joint statement. While there are published reports declaring the use of ASCs but in fact what were used was the SVF[5], other authors using the same material as used in this study refer this correctly as the SVF rather than ASCs[6,7] in their title and abstract. We cannot but emphasize the importance of having an accurate title and abstract as these highlights the objectives, methods, results and conclusion of the study.

We request therefore the authors to clarify whether the material they used for therapy are the unexpanded SVF or the cultured ASCs. We expect modifications in the term "MSC implantation" in their title, abstract and conclusion if SVFs instead of ASCs were actually utilized. We enjoin the research community to be clear and transparent on the materials used to contribute to understanding the real therapeutic potential of SVFs or ASCs.

Contributions

All authors were involved in the manuscript conception, design, drafting and revising, and final approval of the submitted version.

Competing interests

None.

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