Dear Editor,

Osteoarthritis (OA) is believed to be the most common joint disease worldwide with an estimated prevalence of knee and hip OA as 3.8% and 0.8%, respectively (1). The etiology of the disorders lies in the intrinsic joint and extrinsic environmental dynamics such as raised inflammatory cytokines, age, gender, genetics, weight, and injury (1). Treatment of OA mostly consists of conservative therapies that minimally modify the underlying deformities. In the severe cases of OA, total joint replacement has been suggested by OA Research Society International (2). Current investigations recommended less invasive procedures, such as intra-articular administration of hyaluronic acid, platelet-rich plasma, and anabolic cartilaginous bioreactors (3).

Stem-cell (SC) therapies are promptly becoming a possible approach towards the treatment of various diseases, as SCs could repair and regenerate several damaged tissues when exposed to proper cell differentiation mediators (4). In the past two decades, the administration of autologous and allogenic SCs has been practiced for the management of several musculoskeletal disorders and showed promising results (5). Mesenchymal stem cells (MSCs) have been increasingly used via intra-articular injection to improve hip and knee OA (5). In 2014, a proof-of-concept trial asserted that intra-articular administration of MSCs can improve knee OA by reviving the joint’s function and pain (6). According to the present literature, the adverse effects of intra-articular injection of MSCs are negligible (5). These adverse effects may include post-procedural pain and swelling, which was mild and transient in previous investigations. However, it has been noted among 844 patients who received the therapy, two individuals displayed serious complications related to the procedure, one pulmonary embolism and one infection at the bone marrow aspiration site (5).

In contrast to this auspicious evidence, total joint replacement is continued as the final treatment of end-stage OA. Artificial prostheses that are used for joint replacements have to be substituted after a few years, besides they lack the functions of normal joints (7); consequently, they could not satisfy the demands of younger and more active patients. Novel therapeutic approaches must be introduced and translated into clinics in order to provide these demands. Regarding SC therapies, researchers must explain the effects of age and systemic diseases on SCs, and the possible effects of joint inflammatory cytokines on SCs must be clarified as well (8). Moreover, the cartilaginous differentiation of SCs must be maintained over a long period, as SCs may be disproportionally converted to collagens if the environment is not appropriate (8). Providing better techniques for improving the mechanical integrity of the tissues and enhancing cartilage-to-cartilage and cartilage-to-bone integrations (among the SC derived and OA joint tissues) are among the main goals of recent research projects (8).

Extensive investigations suggest that SC therapy could be considered as a promising treatment of OA. MSCs have been introduced as a potential source for regenerative cellular therapies in the case of musculoskeletal diseases. Furthermore, previous level III/IV studies reported intra-articular injection of MSCs can improve osteoarthritis by increasing joint functions and reducing pain (9, 10). This therapeutic approach for patients with osteoarthritic joints may prevent or delay a total joint replacement, although there are serious barriers. Forthcoming studies
should be continued to solve these problems in order to create a reliable protocol for using SC therapy in patients suffering from OA.

Footnotes

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