Advances in stem cell therapy for cartilage regeneration in osteoarthritis - DTU Orbit

Introduction: Osteoarthritis (OA) is a progressive joint disease that compromises the structural integrity of cartilage tissue. Conventional treatments based on medication or surgery are nowadays inefficient and cell-based therapy has emerged as one of the most promising methods for cartilage regeneration. The first therapy developed for cartilage defects was autologous chondrocyte implantation, but in the last few decades stem cells (SCs) from different sources have been proposed as a possible alternative for OA.

Areas covered: SC sources and available delivery procedures (scaffolds/hydrogels) are presented, along with the main issues arisen in this regard. Thereafter, preclinical and clinical trials performed in recent years are reviewed in order to take a glance toward the potential benefits that such therapies could deliver to the patients.

Expert opinion: SCs have proven their potential and safety for OA treatment. Nevertheless, there are still many questions to be resolved before their widespread used in clinical practice, such as the treatment mechanism, the best cell source, the most appropriate processing method, the most effective dose and delivery procedure, and their efficacy. In this sense, long-term follow-up and larger randomized controlled trials utilizing standardized and established outcome scores are mandatory to make objective conclusions.

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