Joint Event on
16th World Congress on Spine & Orthopedics
14th International Conference on Alzheimer's & Nanomedicine
September 21-22, 2022 | London, UK

Receive date: 20.07.2022 | Published date: 23.07.2022 | Published date: 30.09.2022

Emerging trends in translational application of Stem Cell research in Intervertebral disc degeneration

Vikramaditya Rai
Dr. Rajendra Prasad Govt. Medical College & Hospital, India

Low back pain (LBP) is one of the main causes of disability globally associated with plethora of socio-economic burdens as its occurrence is stressful financially as well as psychologically. Intervertebral disc degeneration (IDD) is a chronic, progressive phenomenon associated with exhaustion of the resident cell population, tissue inflammation, degradation of extracellular matrix and ultimately dehydration of the nucleus pulposus. Eventually, IDD may lead to serious outcomes including LBP, disc herniation, segmental instability, and spinal stenosis, which may call for surgical interventions. At present , most patients use rest or conservative treatment for relief from pain, as well as a number of drugs such as steroids, local anaesthetics, and other blocking agents. However , no existing treatment is presently directly able to tackle IDD and aid in hampering the degenerative process. In the last decade, the use of intradiscal stem cell injection is raising as a promising approach to regenerate the intervertebral disc. Thus , keeping in view the future prospectives and existing limitations of this cutting edge technology, our study aims to describe the logic behind the degenerative stem cell therapy for IDD and how the stem cell implantation in the disc environment affect the disc regenerative processes according to various ongoing studies so far. A database search of PubMed, Scopus and Embase was conducted using "stem cells" combined with "intervertebral disc", "degeneration" and "regeneration" without exclusion based on publication date. Both preclinical and clinical studies have been included, the database search yielded recent publications from which the narrative review was completed. Based on available evidence, intradiscal stem cell therapy has positive results in terms of regenerative effects and reduction of LBP. However , multicenter, prospective randomized trials are needed in order to confirm the safety, efficacy and applicability of such a promising biomedical technology.

Recent publications

1. Amirdelfan K, Bae H, McJunkin T,et al. Allogenic mesenchymal precursor cells treatment for chronic low back pain associated with degenerative disc disease: a prospective randomized, placebo-controlled 36 month study of safety and efficacy. Spine J. 2021;21(2),212-230. DOI: 10.1016/j.spinee.2020.10.004
2. Maidhof R, Rafiuddin A, Chowdhary F, Jacobson T, Chahine NO. Timing of mesenchymal stem cell delivery impacts the fate and therapeutic potential in intervertebral disc repair. J Orthop. Res. 2017;35:32-40. DOI: 10.1002/jor.23350
3. Brinjikji W, Diehn FE, Jarvik JG, et al. MRI findings of disc degeneration are more prevalent in adults with low back pain than in asymptomatic controls:a systematic review and meta-analysis. AJNR Am J Neuroradiol.2015;36:2394-2399. DOI: 10.3174/ajnr.A4498

Biography

Vikramaditya Rai was born on 08/08/1995 in Ludhiana city of Punjab state in India. He is a medical graduate and at present he is in his first year of residency in orthopedic surgery from RPGMC, Kangra in Himachal Pradesh, India. He is carrying out his junior resident duties in wards, emergency and OT and is also involved in research on "Comparison of surgical outcomes of standalone (PEEK cage) vs. ACDF in cervical anterior interbody fusion". He is also associated with charitable societies and has helped to improve the lives of patients throughout the community. As an Orthopedic resident, Vikramaditya Rai is known for his patience, dedication, and attention to detail for each individual patient case. His hobbies are kite flying, scuba diving, trying out recipes of exotic desserts and he loves to mentor young students and devotes two hours per week to educational seminars for young students interested in medicine. He hopes to continue his research activities and integrate them in to his medical skills in order to further the field of Orthopedics helping to improve patient outcomes and encourage the next generation of physicians.

raizobiotec@gmail.com