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Evaluation of Allogeneic Stem Cell-Based Therapy through histopathology in a Rabbit Model of Osteoarthritis

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Osteoarthritis (OA) is the most common form of arthritis and mostly results in physical disability. The ability of autologous mesenchymal stem cells to regenerate lost articular cartilage in OA has clearly been proven.

The aim of this study was to estimate the allogeneic stem cells as treatment for OA by microscopic pathological anatomy evidence.

Eighteen male New Zealand white rabbits were used in this study. They were divided into 3 groups (n=6); Rabbit stem cell-treated group (RSTG), Media stem cell-treated group (MSTG) and Normal saline-treated group (NSTG). OA was induced by a single intra-articular injection of 2.5 mg of monosodium iodoacetate (MIA) / 0.3 ml normal saline (NS). After 4 weeks of OA induction the (RSTG) was given a single intra articular injection of rabbit bone marrow-derived mesenchymal stem cells at a density of 1.5X106 cells / 0.3 ml, while both the (MSTG) & (NSTG) received an injection of the same volume of medium without cells & normal saline as respectively. Rabbits were euthanized by intravenous injection of sodium phenobarbital (Dolethal) 100mg/kg at 16 weeks post-treatment then histopathology images were assessed.

The results showed that there were significant differences among all groups in histopathological scoring of the stifle joints evaluation at week 20. The RSTG showed the best histopathological scoring while the MSTG and NSTG showed the worst scores.

In conclusion, single intra-articular injection of rabbit bone marrow-derived stem cells (allogeneic stem cells) could promote the regeneration of damaged articular cartilage in OA as evidenced by improved histopathological outcomes.

Biography

Abofila, M. T. M. is the Head of Veterinary Branch in Faculty of Veterinary and Agricultural Sciences, Al-Zawia University, Zawia-Libya. He had Bachelor Degree in Veterinary Medicine from Tripoli University (2003) and completed his M.V.Sc. studies at Faculty of Veterinary Medicine, University Putra Malaysia (2013) and nowadays, he prepare himself to travel abroad since he got on a scholarship to complete his Ph. D. research studies in the field of stem cell therapy.

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