

Laser activated non-expanded adipose derived stem cells leads to functional recovery in a dog model of multiple sclerosis

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Abstract:

Multiple sclerosis (MS) is a multifocal demyelinating disease of the central nervous system (CNS) which can lead to severe physical and cognitive disability and neurological defects. Damage to the myelin sheath protecting the nerve cells in the brain and spinal cord progresses to partial damage or complete destruction of the axons over time leading to irreversible neurodegeneration. This study aimed to evaluate the treatment of experimentally induced MS in dogs spinal cord through a single injection of laser activated adipose tissue derived Stromal Vascular Fraction (SVF). Results showed positive migration of the cells to the site of lesion, increased remyelination that was detected by Myelin Basic Proteins, positive differentiation into Olig2 positive oligodendrocytes, inhibited the reaction of astrocytes with marked decrease in glial acidic fibrillary proteins which prevented the glial scar formation and restored axonal architecture.

Conclusion:

SVF showed relevant therapeutic potentials in this experimental model of chronic MS and might represent a valuable tool for stem cell-based therapy in chronic inflammatory disease of the CNS and utilizing the advantages of direct and rapid isolation procedure.

Keywords:

Multiple sclerosis; Demyelination; Spinal cord; Canine model; Adipose derived stem cells; Low level laser irradiation.

Biography:

Dr Ahmed is a veterinarian, researcher and stem cell biologist interested in stem cell biology fields, regenerative medicine applications, associated biotechnology, clinical and experimental tissue engineering, Regenerative neurology and neurosurgery (PhD), Regenerative orthopedics (MVSc) and general surgery practitioner with +8 years of experience in this field. He holds many international publications and won many local prizes and now he is the executive manager of the stem cell research lab at Animal Health Research Institute in Egypt. And his passion is decreasing the gap between basic research and clinical applications.

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