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Autologous mesenchymal stem cell transplantation for spinal cord injury: A phase-1 pilot study

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Introduction: Mesenchymal stem cells (MSC) transplantation has recently immerged as promising therapeutic approach to treat spinal cord injury.

Method: We report safety and preliminary findings on efficacy of intrathecal injection of cultured autologous bone marrow derived MSCs (BM-MSCs) in 10 patients suffering from spinal cord injury. All patients had traumatic spinal injury at thoracic level resulting in complete paraplegia. Patients have received 3 doses of autologous BM-MSCs via intrathecal injection. Primary endpoint was safety which was documented by two independent neurologists four weeks after receiving last injection. ASIA scoring, MRI and neurophysiological tests were carried out before treatment and 12 months after receiving treatment.

Results: The patients received at median 3 doses of 1.2×106 MSCs/Kg body weight. The procedure was well tolerated in all subjects with no adverse event or serious complication observed during median follow up of 263 days (range: 100-602 days). Six patients suffered from chronic injury with median duration of 33 months since time of injury (range: 10 to 55 months). Four of them have completed one year of follow up and two have displayed benefits in neurogenic bowel and bladder incontinence, besides limited improvement in hip flexor muscle power, however none has yet shown improvement in ASIA scale. Interestingly, all four patients with sub-acute injury showed some degree of improvement in sensory and motor functions in preliminary reports. These patients also exhibited improved bowel and or bladder control. Detailed report on efficacy will follow on completion of one year follow up of the remainder patients.

Conclusion: This pilot study demonstrated that intrathecal administration of cultured autologous BM-MSCs is safe and feasible for treatment of spinal cord injury.

Biography

Humayoon Shafique Satti is currently a PhD student at Quaid-i-Azam University, Pakistan. He is also working as a Scientific Officer at Armed Forces Bone Marrow Transplant Centre, Pakistan. He is the recipient of ASH Visitor Training Program 2011 and HEC indigenous Scholarship Award (2009-14). He has published 9 papers in national and international journals and he is working as Co-Investigator in two phase-1/2 human clinical trials exploring therapeutic potential of human mesenchymal stem cells in diseases like GVHD and spinal cord injury.

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