



Stem Cell Transplantation (SCT) to Treat Severe Refractory Multiple Sclerosis (MS)

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MS usually affects young adults aged between 20 to 40 years, although it can begin earlier or later in life. Women are affected almost twice as often as men. Symptoms include sensory disturbances in the limbs, optic nerve dysfunction, pyramidal tract dysfunction, bladder or bowel dysfunction, sexual dysfunction, ataxia and diplopia. In severe, drug-resistant MS, SCT was introduced as a treatment option about 20 years ago. Application of autologous SCT is based on the assumption that MS is not inherited in a Mendelian fashion and the autoreactive immune system can be replaced by a healthy one. Allogeneic SCT ensures that all leukocytes are of donor origin, but is applied rarely. Both approaches are fraught with problems resulting, mainly, from the high-intensity pre-transplant conditioning regimens. In certain reported cases, the patients' condition worsened significantly after SCT. Overall, SCT has been applied to relatively few patients worldwide with moderate success, and recent studies suggest that patients with early highly aggressive MS benefit most from this treatment. Recent experimental studies have shown that re-myelination of MS lesions or, in general, CNS lesions, can be achieved by myelinogenic or neural stem cells *via* transplantation or by promoting neural and glial differentiation of endogenous cells.