

Neural stem cells in the spinal cord of Multiple Sclerosis patients

Van Strien, M.E., PhD.

Department of Translational Neuroscience, Brain Center Rudolf Magnus, University Medical Center Utrecht, The Netherlands.

Research question and background

Neural progenitor cells (NPCs) hold promise for future cell replacement therapy for diseases of the central nervous system (CNS). Multiple Sclerosis (MS) is an inflammatory disease of the CNS which is characterized by demyelination. As the spinal cord is a prominent site for lesions in MS, this underscores the significance of NPCs in this region. However, until now such cells have only been described in the brain or in the non-pathological spinal cord.

Methods and tissues used

We examined the presence of NPCs in the MS spinal cord, in comparison with control tissue samples, using immunofluorescent staining for cell proliferation and NPC markers.

Results and conclusion

We found that the central canal region of both the control and MS spinal cord harbors early progenitor cells that are able to proliferate. In addition, we observed a dorso-ventral dissymmetry of the cells in the central canal region, reflecting the heterogeneity of this niche. Moreover, occluded canals with activated/infiltrating cells together with widespread gliosis in and around the central canal regions were observed in of both MS and control spinal cord sections.

Interestingly, based on the immunohistochemical data we did not observe any differences between the MS and control tissue samples. The presence of NPCs in the adult spinal cord reflects that the control as well as the injured MS CNS may hold potential for cell replacement strategies.