

4th International Conference on Tissue Science and Regenerative Medicine

July 27-29, 2015 Rome, Italy

Autologous spinal cord transplantation with olfactory mucosa graft: A promising regenerative treatment for spinal cord injury

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Transplantation of embryonic neural tissues was introduced as a technique of damaged neuronal circuitries repair since the late 1970s, however due to ethical issues research has recently been focused on stem cells transplantation such as olfactory mucosa neurons. Patients with complete paraplegia (ASIA grade A or B) due to spinal cord injury more than 6 months previously and with less than 3cm vertical extent of cord injury on MRI have been included in a relevant clinical trial at the Neurosurgery Department of Osaka University Hospital. The patient's olfactory mucosa graft is taken endoscopically and then processed into small pieces. Afterwards, spinal cord's posterior medial sulcus is opened, the scar is removed and the autograft is transplanted into the cavity. Patients have demonstrated electromyographic signals in response to voluntary effort as early as 3 months after the transplantation while emergence of motor evoked potential has also been observed indicating the recovery of electrophysiological conductivity of the corticospinal tract. Moreover, some patients have shown improvement in motor function below the level of injury. The neural condition of the severed caudal spinal cord seems to influence the potential for motor function recovery while the time interval between injury and transplantation does not seem to be an important factor since improvement from ASIA grade A to grade D has been achieved in one patient even when the transplantation was performed ten years after the injury. Involuntary muscle spasm before transplantation seems to be a predictor of success of regenerative treatment in chronic spinal cord injury patients.

Biography

Panagiotis Zogopoulos is a Resident of Neurosurgery at the General Hospital of Nikaia-Piraeus "Agios Panteleimon", Athens, Greece. He has received a 6-month advanced clinical training (clinical fellow) at the Neurosurgery Department of Osaka University Hospital in Japan, where an ongoing clinical trial about spinal cord transplantation with olfactory mucosa autograft is being conducted. Several of his papers have been published in reputed peer-review journals and he has presented various researches in international conferences.

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