

Long-term outcome of olfactory ensheathing cell transplant in chronic spinal cord injured patients

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Objective: The neurorestorative effect of olfactory ensheathing cell (OEC) therapy remains clinically controversial. The purpose of this study was to determine the long-term follow-up outcome of fetal bulb OECs for the patients with chronic spinal cord injury (SCI)

Methods: Of 497 chronic SCI patients (388 Chinese and 109 foreigners), following fetal OEC transplant for a period of 3.52 ± 1.07 years, 136 patients were followed up successfully. They were divided into two groups based on their rehabilitative training, which including Group A (n=97) in sufficient rehabilitation and Group B (n=39) in insufficient rehabilitation. All patients were assessed by using the American Spinal Injury Association (ASIA) standard and International Association of Neural Restoration (IANR) Spinal Cord Injury Functional Rating Scale (SCI-FRS). Some of them who came back to our hospital for long term follow-up were evaluated by magnetic resonance imaging (MRI), electromyography (EMG), and, paravertebral sensory evoked potential (PVSEP) except ASIA and IANR SCI-FRS assessment.

Results: No deterioration or complications were found in any of the patients within the follow-up duration. (1) According to ASIA assessment standard, mean motor scores increased from 41.15 ± 21.29 to 46.30 ± 20.80 ($p < 0.01$), light touch scores from 55.45 ± 26.66 to 67.56 ± 25.71 ($p < 0.01$), pain scores from 56.45 ± 26.60 to 65.12 ± 25.01 ($p < 0.01$) from pre-operation to post-operation in Group A. Meanwhile, mean motor scores increased from 37.85 ± 18.39 to 38.69 ± 18.28 ($p < 0.05$), light touch scores from 47.08 ± 22.48 to 47.15 ± 22.30 ($p > 0.05$), pain scores from 47.41 ± 23.08 to 47.82 ± 24.07 ($p > 0.05$) in Group B. Comparing Group A with Group B, the score change in terms of motor, light touch, and pain were remarkably different (all $p < 0.01$). (2) According to IANR SCI-FRS assessment standard, the total scores increased from 19.90 ± 11.54 to 24.73 ± 11.57 ($p < 0.01$) in Group A, while the scores from 17.92 ± 9.30 to 19.72 ± 9.20 ($p < 0.05$) in Group B. The improvement extent of the quality of life is significant difference between two groups ($p < 0.01$). (3) MRI examinations were completed for 38 patients. Compared with pre-operative MRI, there were no neoplasms, bleeding, swelling, cysts, neural tissue destruction or infection (abscess) nor any other pathological changes in or around OEC transplant sites. (4) EMG examinations were done on 38 patients. Compared with the pre-operative EMG, 35 showed improvement; the remaining three had no change. PVSEP tests were performed in 38 patients. Compared with the pre-operative PVSEP, 34 showed improvements and the remaining four had no change.

Conclusion: These results of long term follow-up show that (1) the clinical procedure of OEC therapy is safe and feasible, and can partially recover the patients' neurological functions and improve their quality of life; (2) rehabilitation exercise plays an important role in the neurorestoratology of OEC therapy.

References:

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