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Clinical efficacy of the neural precursor cells transplantation to treat the severe visual impairment – A sequel of neonatal brain injury

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Objective: To investigate the clinical efficacy of the neural precursor cells transplantation to treat the severe visual impairment – a sequela of neonatal brain injury.

Methods: 52 patients with cerebral injury and visual impairments caused by various reasons in our hospital out-patient department from May 2005 to Feb 2009 were selected and randomly divided into 2 groups: the treatment group (n=25, with the average age of 18 months) and the control group (n=27, with the average age of 19.5 months). There were no significant difference in the sex, age, cause of disease, type of cerebral injury and visual impairment degree between two groups. The treatment group received intraventricular transplantation of human neural stem cells and rehabilitation training. The control group received rehabilitation training only.

Results: 1 in 5 fundus abnormalities associated with blindness patients got light perception. The visual functions of 15/20 patients with normal fundus were improved 1 level or more. After 2-year follow up, the visual function of 3 paitents improved from level I to level II, 4 from level I to level III, 1 from level I to level IV, 2 from level II to level III, 3 from level II to level IV, 2 from level II to level V. The efficacy appeared on 60 days post transplantation in median and the effective rate is 64% in the treatment group. In the patients showed efficacy in the treatment group, 1 blindness patient got light perception. 5 (31.2%) got I level improvement, 10 patients (62.5%) got more than I level improvement.

In the control group, 4 patients with fundus abnormalities showed no improvement in the visual function. The visual function of 9 cases in the other 23 cases improved at least 1 level. After 2-year follow up, there was no patient whose visual function improved from blindness to level I, 2 from level I to level II, 1 from level I to level III, 4 form level II to level III, 1 from level II to level IV, 1 from level II to level V. The total effective rate is 33.33%. In the patients showed efficacy in the control group, 6 patients (66.67%) improved I level, 3(33.33%) improved more than I levels. The efficacy appeared on 365 days in median. Part of the patients underwent the functional Magnetic Resonance Imaging (fMRI) showed positive activation signals in occipital lobe, visual pathway and apical lobe After transplantation,

Conclusion: Neural precursor cells transplantation is effective for the patients with severe visual impairment – a sequela of neonatal brain injury. NPCs transplantation showed significantly earlier improvement, higher improvement rate and degree in visual function compared with the traditional rehabilitation training

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