Neural stem cell transplantation in a rat model of intracerebral haemorrhage plus haematoma aspiration

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YH Sang[1,2], HX Su[2], XY Yang[2], LG Liu[1], WT Wu[2], RTF Cheung[1]
[1]Department of Medicine, The University of Hong Kong, Hong Kong
[2]Department of Anatomy, The University of Hong Kong, Hong Kong

Introduction: Cell replacement therapy holds great potential for brain tissue repair following intracerebral haemorrhage (ICH). Haematoma evacuation alleviates the mass effect and prevents the secondary pathological processes. This study was conducted to investigate the survival and differentiation of neural stem cells (NSCs) after transplantation into the brain cavity following haematoma aspiration in adult male Sprague-Dawley rats.

Methods: Experimental ICH was induced by local injection of bacterial collagenase IV into the basal ganglia. Haematoma was removed 3.5 hours after ICH onset. Following the removal, E13.5-derived NSCs were injected into the lesion. Two weeks after transplantation, the survival and differentiation of transplanted cells was assessed immunohistochemically. The concentration of trophic factors in the transplanted brain areas was measured using ELISA. Function recovery was evaluated 1, 3, 7 and 14 days after ICH.

Results: Transplanted NSCs survived along the wall of haematoma cavity and partially migrated into the brain parenchyma 2 weeks after transplantation. One third of the survived cells (30.0±9.7%) remained undifferentiated and others could differentiate into astrocytes (45.7±14%) and neurons (0.6±0.3%). NSCs transplantation group showed a trend toward increased secretion of NGF, BDNF and GDNF in the ipsilateral striatum. NSCs-transplanted group showed improved functional recovery when compared to the control group 2 weeks after transplantation.

Conclusion: The results provided evidence that the NSCs transplantation into the brain cavity after haematoma aspiration may be a potential treatment strategy in ICH.

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Significance of HBV DNA levels at 12 weeks of telbivudine treatment and the 3-year treatment outcome

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WK Seto, CL Lai, J Fung, DK Wong, JC Yuen, IF Hung, MF Yuen
Department of Medicine, The University of Hong Kong, Hong Kong

Objective: The significance of early HBV DNA suppression during telbivudine treatment in predicting long-term outcomes needs further investigation.

Methods: We determined the cumulative rates of HBeAg seroconversion, ALT normalisation, HBV DNA suppression (<12 IU/mL) and telbivudine-resistant mutations (using the highly sensitive line probe assay) for 117 treatment-naïve chronic hepatitis B (CHB) patients (61.5% HBeAg-positive) on telbivudine for 3 years. The significance of serum HBV DNA at week 12 and 24 was compared.

Results: The median age and duration of follow-up were 39 years and 24.2 months, respectively. A total of 117, 105, 69 and 43 patients had been followed up for at least 6 months and 1, 2, and 3 years respectively. The cumulative rates of HBeAg seroconversion, ALT normalisation, HBV DNA undetectability were 46.8%, 80.5% and 51.2% respectively at 3 years. There was an incremental increase in virologic breakthroughs to 39.5% by year 3. The cumulative rate of telbivudine-resistant mutations was 4.8%, 17.6% and 34.0% for year 1, 2 and 3 respectively. Week 12 HBV DNA of <200 IU/mL was predictive of a higher chance of HBV DNA undetectability (P=0.022) and lower chance of resistance (P=0.001) by year 3. Undetectable HBV DNA at week 24 was predictive of viral suppression at year 2 (P<0.001) but not at year 3 (P=0.241).

Conclusion: Continuous telbivudine resulted in improved biochemical and virologic outcomes, although there was an incremental increase in cumulative rate of resistance up to year 3. Week 12 HBV DNA of <200 IU/mL was predictive of favourable long-term outcomes.

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