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Cord blood cell transplantation provides improvement for severely brain-injured child

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In three monthly injections, researchers transplanted neurally-committed, autologous cord blood derived cells tagged with iron oxide nanoparticles (SPIO) into the lateral cerebral ventricle of a 16-month old child with severe global hypoxic ischemic brain injury. The study is published in the current issue of *Cell Medicine*.

found through MRI tracking that the primary injected and tagged cells persisted in that brain hemisphere for more than four months. By six months, the severely impaired child showed some slight improvement over a former vegetative state.

"Hypoxic-ischemic encephalopathy remains one of the most devastating conditions in children, resulting in brain atrophy and persistent functional neurological impairment," said Dr. Krystyna Domanska-Janik, corresponding author.

According to Dr. Domanska-Janik, they transplanted cord blood neural cells by repeated injection into lateral cerebral ventricle as the method appeared to be superior to intravascular injections because there would be a more "local modulating outcome."

"The capacity of cells to home to damaged sites in the central nervous system is crucial," said Dr. Domanska-Janik. "Our study found that transplantation of patient self-donor (autologous), neurally-committed cord blood cells is feasible, well tolerated, and safe."

Once more, the transplanted cells were easily assessed by MRI for four months.

"Despite signs of neurological improvement noticed by the parents and neurologists after cell transplantation, this one case does not allow us to predict the true efficacy of such a treatment and further studies are needed," she added.

The research team did suggest that six months post-transplantation, the child's diagnosis of a 'vegetative state' was no longer justified as the boy began responding to his mother's voice by smiling and a 50 percent reduction in his rate of seizures was achieved.

According to Dr. Paul Sanberg, executive director of the Center of Excellence for Aging and Brain Repair at the University of South Florida, and executive editor of Cell Medicine, this case report is potentially important.

"This first step in the use of autologous stem cells as a treatment for neonatal ischemic brain repair in the clinic provides a guardedly optimistic report for future studies," said Dr. Sanberg. "Of course, further and more comprehensive studies, with a larger patient population, are required to confirm its potential efficacy."

More information: Jozwiak, S.; Habich, A.; Kotulska, K.; Sarnowska, A.; Kropiwnicki, T.; Janowski, M.; Jurkiewicz, E.; Lukomska, B.; Kmiec, T.; Walecki, J.; Roszkowski, M.; Litwin, M.; Oldak, T.; Boruczkowski, D.; Domanska-Janik, K. Intracerebroventricular Transplantation of Cord Blood-Derived Neural Progenitors in a Child With Severe Global Brain Ischemic Injury. Cell Medicine 1(2):71-80; 2010. http://www.ingentaconnect.com/content/cog/cm

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