Therapeutic potential of human cord blood cells in patients with neurological and psychiatric disorders

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Most of the therapies for neurological disorders are palliative rather than restorative, greatly impacting the quality of life for affected individuals, as well as the medical burden of society. The use of stem cells holds the promise of regenerating affected neurological tissues. Cord blood stem cells are amenable to neurological applications as evidenced by in vitro studies and pre-clinical animal models of diseases.

In the course of pilot clinical trials carried out in a number of medical institutions in Moscow and St-Petersburg the safety and efficiency of intravenous infusion of human cord blood cells (HCBC) was studied in patients with neurodegenerative diseases and resistant neurological deficit after severe brain trauma. The following disorders were included in these trials: posttraumatic encephalopathy (10 patients), Parkinson disease (10 patients), Alzheimer disease (7 patients), cerebral palsy (20 patients), epilepsy (15 patients), schizophrenia in remission (10 patients). Approval of scientific boards, ethical committees and informed patient consents (in case of under age patients consent was given by parents) were obligatory conditions to obtain HCBC from CryoCenter.

HCBC were administered intravenously 1-4 times with 2 weeks intervals (in case of multiple infusions). Standard therapeutic protocols were preserved. Patient's follow-up for 6-12 months demonstrated that intravenous injection of group- and rhesus-compatible HCBC to patients with the neurological and psychiatric disorders studied does not cause any adverse effects. On the contrary, after HCBC infusions significant improvement of cognitive functions is observed including restitution of brain programs lost earlier in some Alzheimer's patients. Positive effects of HCBC therapy are preserved for a long period, which may be explained by trigger nature of the therapy as well as by activation of neurogenesis in certain brain regions. In oral presentation the results of HCBC administration in patients with above mentioned disorders will be discussed including possible paracrine mechanisms underlying observed clinical effects.