

A NOVEL THERAPEUTIC STRATEGY FOR CEREBRAL PALSY: FEASIBILITY OF AUTOLOGOUS CORD BLOOD CELL THERAPY FOR NEONATAL HYPOXIC-ISCHEMIC ENCEPHALOPATHY

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Objective: A novel therapeutic strategy for prevention of cerebral palsy (CP) has been initiated in Japan. Hypoxic-ischemic encephalopathy (HIE) occurs in 0.5-1.0 per one thousand newborns and leads to CP. Therapeutic hypothermia (TH) improved mortality of newborns suffering with HIE, however it is not perfect therapy. We have been preparing to start a clinical trial of umbilical cord blood (UCB) cell therapy for neonatal HIE in addition to TH.

Methods: UCB collection will be restricted to mothers who have given prior written informed consent for collection. UCB was collected aseptically and non-cryopreserved autologous volume- and red blood cell-reduced UCB cells (up to 3 doses adjusted for volume) will be prepared by using SEPAX.

Results: UCB collection and infusion preparation in normal deliveries were as follows: (1) number of CD34 positive cells was more than 90%, and survival rate of CD34-positive cells remained at 99% at 72 hours after separation. (2) Rise of potassium after 72 hours due to events such as contamination of red blood cells was median 5.8 mEq/L (1.7-11.6). (3) In the separation at SEPAX, to set on the machine, the minimum requirement of UCB volume was 40 ml, and exclusion criteria must be set for clotting of UCB collected at the time because valid cell separation and recovery becomes impossible.

Conclusions: Good results in UCB collection and infusion preparation were obtained when compared to the results of Cotten et al. (J Pediatr. 2014). although there is a difference between high risk and normal deliveries.