

Intraventricular Hemorrhage Clearance Markers in Human Neonatal CSF: Predictors of Hydrocephalus and Outcome

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Introduction

Infants with intraventricular hemorrhage (IVH) are at risk for post hemorrhagic hydrocephalus (PHH) and poor outcomes. Iron has been implicated in cell death, brain injury, PHH and poor outcomes in animal models. We hypothesized differences in endogenous iron clearance markers or blood breakdown pathways in IVH influence development of PHH and neurodevelopmental outcomes.

Learning Objectives

1. Readers will recognize elevated CSF hemoglobin levels after IVH as a potential predictor of PHH
2. Readers will recognize the association between increased ventricular hepcidin levels and worsened cognitive outcomes at age 2
3. Readers will understand the potential role for CSF levels of hepcidin and hemoglobin in predicting the clinical course of infants with PHH

References

1. Chen Z, Chen Z, Gao C, et al (2011) Role of iron in brain injury after intraventricular hemorrhage. *Stroke* 42:465–470.
2. Gao C, Du H, Hua Y, et al (2014) Role of red blood cell lysis and iron in hydrocephalus after intraventricular hemorrhage. *Journal of Cerebral Blood Flow & Metabolism* 34:1070–1075.
3. Garton TP, He Y, Garton HJL, et al (2016) Hemoglobin-induced neuronal degeneration in the hippocampus after neonatal intraventricular hemorrhage. *Brain Research* 1635:86–94
4. Savman K, Nilsson UA, Blennow M, et al (2001) Non-protein-bound iron is elevated in cerebrospinal fluid from preterm infants with posthemorrhagic ventricular dilatation. *Pediatr Res* 49:208–212.

