Periventricular-intraventricular hemorrhage treatment

- Validity of ChatGPT in Assisting Diagnosis of Periventricular-Intraventricular Hemorrhage via Cranial Ultrasound Imaging in Very Preterm Infants
- Analysis of treatment outcomes of extremely preterm infants in a real-world single center
- Extremely preterm infants born outside a provincial tertiary perinatal center and transferred postnatally associated with poor outcomes: a real-world observational study
- Nonhematopoietic Umbilical Cord Blood Stem Cell Administration Improves Long-term Neurodevelopment After Periventricular-Intraventricular Hemorrhage in Neonatal Rats
- Risk factors for periventricular-intraventricular haemorrhage severity in preterm infants: a propensity score-matched analysis
- Effect of fetal lung maturation on the efficacy of acetaminophen for premature infants with patent ductus arteriosus
- Efficacy of volume-targeted ventilation versus high-frequency oscillatory ventilation in the treatment of neonatal respiratory distress syndrome
- Clinical characteristics and risk factors of periventricular-intraventricular hemorrhage in extremely low birth weight infants

Zaben et al reviewed the available literature on the usefulness and complications of the initial measures used in the treatment of PHH; particularly, focusing on serial cerebrospinal fluid (CSF) tapping, external ventricular drainage (EVD), ventriculosubgaleal shunts (VSG), ventricular access devices (VADs), endoscopic third ventriculostomy (ETV) with and without coagulation of the choroid plexus.

Randomised controlled trials (RCTs) have failed to demonstrate a significant effect of serial lumbar punctures on the rates of morbidity, mortality or conversion to permanent VPS in the treatment of PHH. Retrospective studies, mostly with small patients' numbers, provide not only a considerable controversy regarding EVD, VSG, VADs and ETV usefulness in the management of PHH but also variable rates on their complications. None of these variables have, however, been tested using RCTs.

There is no level-one evidence to support the superiority of any of the currently available temporising measures in the initial treatment of PHH over others. The need for such rigorous studies remains largely unmet. We feel that a UK multi-centre-RCT is paramount to provide neurosurgeons with the evidence needed to choose the best initial approach for PPH treatment, yet with minimal complications' rate [1)]

General measures

General measures are directed at optimizing CPP without further excessive elevation of CBF by carefully maintaining normal MAP and normalizing pCO2, and by treating active hydrocephalus (HCP) as needed.

While daily LPs can control the deleterious effects of posthemorrhagic HCP, they do not reduce the frequency of long-term HCP (requiring permanent shunting). Ventricular size must be monitored with serial U/S.

Medical treatment

1. not very effective. Treated patients fared worse in several studies

2. osmotic agents: isosorbide, glycerol. Effects are short-lived

3. diuretic therapy: has been used, but a large study showed increased nephrocalcinosis and biochemical abnormalities, resulting in a borderline increase in the risk for motor impairment at one year [2)].

The results were so compelling, the data-monitoring committee terminated the study prematurely. Furosemide and acetazolamide therapy was deemed neither safe nor effective in treating post-hemorrhagic ventricular dilatation and cannot therefore be recommended [3)].

Considerable center variability exists in temporization of intraventricular hemorrhage in prematurity; however, variation between centers is not seen with permanent shunting. Increasing ventricular size- rather than classic clinical findings such as increasing occipitofrontal circumference (OFC), represents the threshold for either temporization or shunting of cerebrospinal fluid CSF.

Intraventricular hemorrhage in premature infants often leads to progressive ventricular dilation and the need for ventricular reservoir placement. Unfortunately, these reservoirs have a higher rate of infection than ventriculoperitoneal shunts in premature babies.

Ventriculoperitoneal shunting as a primary neurosurgical treatment in posthemorrhagic hydrocephalus would decrease surgical morbidity with good functional outcome [4)].

Gestational age at procedure and previous meningitis were significant risk factors for ventricular access device (VAD) infections. In addition, the implementation of an institutional standardized shunt protocol for ventriculoperitoneal shunts may have altered the operating room team's behavior, indicated by a nonmandated use of intrathecal antibiotics in VAD surgeries, contributing to a reduced VAD infection rate. Although the observed difference was not statistically significant with the small sample size, Spader et al. believe that these findings deserve further study [5)].

Surgery

see Periventricular-intraventricular Hemorrhage Surgery.

1)
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2)
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3)
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ventricular dilatation. Cochrane Database Syst Rev. 2001. DOI: 10.1002/14651858.CD002270
4)

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5)

Spader HS, Hertzler DA, Kestle JR, Riva-Cambrin J. Risk factors for infection and the effect of an institutional shunt protocol on the incidence of ventricular access device infections in preterm infants. J Neurosurg Pediatr. 2015 Feb;15(2):156-60. doi: 10.3171/2014.9.PEDS14215. Epub 2014 Dec 5. PubMed PMID: 25479576.