Cerebrospinal fluid pressure

Cerebrospinal fluid pressure, as measured by lumbar puncture (LP), is 10-18 cmH2O (8-15 mmHg or 1.1-2 kPa) with the patient lying on the side and 20-30cmH2O (16-24 mmHg or 2.1-3.2 kPa) with the patient sitting up.

In newborns, CSF pressure ranges from 8 to 10 cmH2O (4.4–7.3 mmHg or 0.78–0.98 kPa). Most variations are due to coughing or internal compression of jugular veins in the neck. When lying down, the cerebrospinal fluid as estimated by lumbar puncture is similar to the intracranial pressure.

Low cerebrospinal fluid (CSF) pressure results in neurologic deficits, of which the most common manifestation is headache. Typically, the headache is postural - and specifically, orthostatic - in presentation.

see also Intracranial pressure.

The aim of a study of Kim et al. was to retrospectively evaluate and analyze the relationships between head circumference percentile (HCP), lumbar puncture pressure (LPP), and cerebrospinal fluid (CSF) space.

The 88 patients were divided into 3 age groups (group 1, up to 12 months; group 2, 12-36 months; group 3, 36-72 months).

In group 1 (n = 40), there was a significant positive correlation of the HCP with the LPP (r =0.414, p =0.008), Evans ratio (r =0.365, p =0.021), and thickness of subdural hygroma (SDHG; r =0.403, p =0.010). Group 2 (n = 29) revealed a significant positive correlation between the LPP and the thickness of SDHG (r =0.459, p =0.012). Group 3 (n = 19) showed no significant correlation among these factors. Overall, age was related with SDHG thickness both in infants and toddlers, while HCP was related with LPP, Evans ratio, and SDHG thickness only in infants, and LPP was related with SDHG thickness only in toddlers.

Kim et al. suggested that increased cerebrospinal space and cerebrospinal fluid pressure may result in compensatory enlargement of head circumference only in the infant period, and the subdural hygroma thickness decreases with age during the infant and toddler phases [1].

Dural ectasia usually occurs in the lumbosacral region, as this is where the cerebrospinal fluid pressure is greatest, but the spinal canal can be affected in any plane.

1)
Kim MJ, Choi DH, Yoo CJ, Lim YC, Yoon SH. Relationships between Head Circumference Percentile, Lumbar Puncture Pressure, and Cerebrospinal Fluid Space in Young Children: Increased Cerebrospinal Space and Pressure May Result in Compensatory Enlargement of Head Circumference Only in the Infant Period. Pediatr Neurosurg. 2019 Oct 10:1-8. doi: 10.1159/000503113. [Epub ahead of print] PubMed PMID: 31600754.