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CEREBROSPINAL FLUID PARAMETERS ALONE DO NOT INFORM INFECTION MANAGEMENT IN POSTHEMORRHAGIC HYDROCEPHALUS

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Preterm posthemorrhagic hydrocephalus (PHH) is often managed with ventricular reservoir or shunt placement, which carry infection rates as high as 10%, necessitating long-term antibiotics. In patients who undergo a septic workup, cerebrospinal fluid (CSF) samples may show pleocytosis, precipitating antibiotic treatment despite the lack of positive cultures. In this study, we analyze the CSF and complete blood count (CBC) profile from the same day in subjects with culture positive (CP) meningitis compared to culture-negative CSF across eight groups, including patients with PHH.

A retrospective analysis was performed on 200 subjects — 30 controls, 9 central line associated blood stream infection (CLABSI), 38 intraventricular hemorrhage (IVH) grade I or II, 9 IVH grade III or IV, 36 culture negative PHH, 43 CP viral meningitis (VM), 25 CP bacterial meningitis (BM), and 10 CP/BM with PHH. Subjects on antibiotics or ≤ 7 days post antibiotics were separated into another group. CSF samples were obtained by lumbar puncture, reservoir tap, or operating room procurement. Statistical significance was based on one-way analysis of variance (ANOVA) among all groups and Tukey's multiple comparison test between groups ($p < 0.05$).

Significant results include: CSF total protein was higher in PHH compared to other groups, including VM. Macrophages in IVH III/IV were higher compared to other groups. White blood cells (WBC) were higher in CLABSI than other groups. VM WBC was lower than PHH. Hemoglobin was lower in PHH than VM and IVH I/II. Hemoglobin in PHH with BM was lower than controls. Hematocrit in PHH was lower compared to other groups. Platelets in CLABSI were lower compared to VM.

We therefore conclude that CSF profile alone should not be used to dictate antibiotic initiation. CSF and blood culture results in combination with CSF and CBC profiles may be a better guide for infection management.