1006. Diagnostic accuracy of CSF cell index and corrected CSF white blood cell count in healthcare-associated ventriculitis and meningitis after intracranial hemorrhage

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Background. The diagnosis of healthcare-associated meningitis and ventriculitis (HCAMV) in patients with intracranial hemorrhage (ICH) is challenging. The purpose of this study was to evaluate the diagnostic accuracy of routine cerebrospinal fluid (CSF) studies including a cell index and a corrected white blood cell (WBC) count.

Methods. Case control study of adult patients with the diagnosis of ICH and HCAMV at a large tertiary care hospital in Houston, Texas from 2003 to 2016. Cases were defined as patients with ICH and HCAMV as documented by a positive CSF culture. Controls were selected as patients with ICH without evidence of HCAMV, no previous antibiotic therapy and a negative CSF culture. Cases and controls were matched 1:2 by age, Glasgow Coma Scale (GCS) and Apache II scores. Cell index was calculated using the following formula: (CSF leukocytes / CSF erythrocytes) / (blood leukocytes / blood erythrocytes). Corrected WBC count was calculated using the following formula: CSF leukocytes / (CSF erythrocytes x 1,000). Area under the curve of receiver operating characteristic (AUC-ROC) and 95% confidence interval (CI) for CSF cell index greater than or equal to absolute value of 1, corrected CSF WBC count greater than 5 K/μL, CSF lactate greater than 4 mmol/L, and CSF glucose less than 40 mmol/L, respectively, were calculated in order to determine the accuracy of these tools.

Results. A total of 120 patients with ICH were included in this study; 40 patients had proven HCAMV whereas 80 patients had ICH with no evidence of HCAMV. Matching of cases and controls by age, GCS, and Apache II score was appropriate (p>0.05). The AUC-ROC values for CSF cell index were 0.731 (95% CI = 0.589–0.872), 0.719 (95% CI = 0.573–0.864), and 0.609 (95% CI = 0.449–0.768), respectively.

Conclusion. This study demonstrated poor accuracy of CSF cell index, corrected CSF WBC count, CSF lactate, and CSF glucose in diagnosis of HCAMV after ICH.

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1007. Achieving Optimal Specialty Cerebrospinal Fluid (CSF) Testing: Are Electronic Medical Record Order Sets Helpful?

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Background. Specialty PCR testing has become available for lumbar puncture to determine the cause of infectious meningitis and encephalitis. Testing with low pre-test probability may increase antimicrobial therapy while results are pending and create added direct costs. We aim to describe the appropriateness of testing before and after the implementation of electronic medical record (EMR) order sets designed to reduce excessive testing of CSF by creating two lists of tests: (1) a routine panel for all patients and (2) a list of optional specialty tests designed to be utilized after the nucleated cells are results.

Methods. Retrospective study of adult patients undergoing lumbar puncture with suspicion for CNS infection pre-and post-implementation of EMR order sets from January 2016–March 2017. Consecutive patients with complete charts were reviewed from a tertiary care center. Data collected included demographics, co-morbid conditions, clinical presentation, and lumbar puncture results. The primary outcome of interest was the frequency of CSF specialty testing in patients with ≤10 nucleated cells/μL in the CSF.

Results. Two hundred patients had ≤10 nucleated cells/μL in the CSF (n = 108 in pre-EMR group; n = 92 in post-EMR group). Of these patients 74% and 48.8% had Herpes Simplex Virus (HSV) PCR testing done pre and post EMR changes (P = 0.05). Enterovirus PCR testing remained similar among both groups (37% pre-EMR order sets vs. 36.9% post-EMR order sets, P = 0.59). Lyme PCR testing decreased between pre- and post-EMR changes (9.2% vs. 0.9%, P = 0.03, respectively). The protein concentration also dropped significantly from 26.9% to 7.6% (P < 0.05). All specialty PCR testing that was performed on patients with ≤10 nucleated cells/μL in the CSF were negative. Paradoxically, HSV antibody testing increased post-implementation of EMR order sets (21.7±10% vs. 0%, P<0.05). Total costs of tests on average decreased by $70.71 per patient post EMR changes.

Conclusion. In this cohort, CSF specialty testing was common but decreased after EMR changes. Laboratory stewardship can be improved with EMR changes but further education is needed to prevent unnecessary tests. Unwanted tests (HSV antibodies) may be increased as prescribers are unable to locate familiar tests.

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1008. Brain Abscess Risk Associated with Genotypic Polymorphism of the Matrix Metalloproteinase-1, -2, -3, -9 and -13 in North Indian Population

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Background. Brain abscess develops in response to a parenchymal infection due to pyogenic bacteria. MMPs (matrix metalloproteinases) play vital role in many infectious and central nervous system (CNS) diseases. The present study evaluated the association of specific alleles/genotypes of MMP-1, -2, -3, -9 and -13 with brain abscess.

Methods. A total of 100 brain abscess patients and 100 healthy controls were included in the study. Presupposing factors were identified in 70 brain abscess patients. Out of 100 patients brain abscess samples were obtained from 66 were culture positive. MMP1-1607 1/2G, MMP-2: C-1306-T, MMP-3: -1171 5A/6A, and MMP-9 C-1562T genotypes were detected by PCR-RFLP. Levels of these MMPs were determined in patients’ sera by ELISA and correlated with different genotypes.

Results. The genotypic distributions of MMP-1 1607 1G/2G, MMP-2: C-1306-T, MMP-3: -1171 5A/6A, and MMP-9 C-1562T polymorphisms lead to increased production of these molecules, which appear to be a risk for the development of brain abscess in North Indian population.

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