hemorrhage (SAH) decreases along with the development of modern treatment strategies. On the contrary, poor clinical outcome in patients with SAH due to early brain injury (EBI) has been noticed recently. In the present study, we evaluated the impact of EBI on outcome of SAH patients.

Methods: Data of 39 patients with SAH due to rupture of saccular aneurysm treated at our institution during the periods of 3.5 years from January 2015 was retrospectively analyzed. Baseline characteristics were compared using χ^2 test. Multivariate logistic regression analyses were performed to account for patients' characteristics and clinical parameters.

Results: In univariate analyses, older age, LOC at ictus, initial WFNS poor grade, radiographic vasospasm, and DCI were associated with poor outcome. Multivariate logistic regression analyses revealed older age ($p < 0.0001$) and LOC at ictus ($p = 0.0018$) were associated with poor outcome.

Conclusions: The influence of EBI on outcome in patients with SAH emerges along with the development of modern treatment strategies those prevent vasospasm. Finding out the pathologic clarification of EBI as well as developing new therapeutic strategies to prevent EBI seems to be important in the future.

Trial registration number: N/A

AS28-048

EARLY IMMUNE CELL CHANGES AFTER SUBARACHNOID HEMORRHAGE: ROLE IN PREDICTING VASCULAR DYSFUNCTION DETECTED BY TRANSCRANIAL DOPPLER ULTRASONOGRAPHY

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Background and Aims: Aneurysmal subarachnoid hemorrhage (aSAH) is a devastating neurological injury commonly resulting from the rupture of cerebral aneurysms. Early brain injury (EBI) occurs within the first 48–72h post hemorrhage and is characterized by an intense neuroinflammatory response, microvascular dysfunction, edema, and neurovascular uncoupling. Transcranial Doppler (TCD) ultrasound is routinely used in aSAH to monitor for vascular dysfunction. Pulsatility index (PI), as determined by TCD, correlates with microvascular compliance. In comparison, the Lindegaard ratio (LR), is typically used to estimate the caliber of the middle cerebral artery.

Methods: In this study we sought to investigate the relationship between cerebrospinal fluid (CSF) immune cells, peripheral immune cells, and changes in the PI and LR. Subjects were recruited from a tertiary referral center. CSF was obtained only from those patients receiving a ventricular drain, while serum samples were obtained from all patients. Samples were collected daily for 5 days following admission. Linear regression and ANOVA were used to assess correlation between immune cells, PI, and LR.

Results: A total of 170 aSAH patients were included in the analysis. Mononuclear cells in the CSF correlated with PI at day 1 ($R2 = 0.524$ $p = 0.011$) and day 3 ($R2 = 0.877$ $p < 0.0001$). Total CSF leukocytes on day 3 also showed modest correlation to elevated LR on day 5 ($R2 = 0.3683$, $p = 0.0164$).

Conclusions: Results of this study support the notion that early immune cell changes in the CSF are associated with microvascular compliance. Future studies are necessary to assess the effect of these early changes in outcome.

Trial registration number: N/A

AS28-045

THE RELATIONSHIP BETWEEN ANGIOARCHITECTURAL CHARACTERISTICS OF BRAIN ARTERIOVENOUS MALFORMATIONS AND SPECIFIC FEATURES OF CLINICAL PRESENTATION

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Background and Aims: The persistence of arteriovenous shunting causes changes in cerebral hemodynamics, which lead to chronic headache, cognitive impairment and focal neurological deficit. Understanding of AVM angioarchitectural and hemodynamic features is important to determine treatment strategy. Aim: to investigate the relationship between angioarchitectural characteristics of AVM and specific features of clinical presentation.

Methods: From 2014 to 2018, we collected the data of 296 patients with brain AVM-related. Clinical, neuropsychological, angiographic, CT perfusion and MRI examination was done.

Results: AVM manifested with hemorrhage in 140 (47%) patients. A multivariate model of logistic regression revealed an independent association of hemorrhage with AVM size less 3 cm (OR 3.15), single feeding artery (OR 2.17), single drainage vein (OR 1.96), drainage into the deep veins (OR 4.49) comorbid aneurysms (OR 4.39). Among the patients patients with non-hemorrhagic course, headache like AVM manifestation was detected in 57% of patients. It associated with occipital region AVM (OR 1.03; 95% -CI 1.00–2.05), with superficial AVM (OR 2.14), with existing of transdural communication (OR 3.46). The formation of cognitive impairment was independently associated with the presence of high-flow shunting (OR 5.11), long pial course of draining vein (OR 1.79), signs of arterial steal (OR 3.84) and hydrocephalus (OR 4.44) and was finded in 17%. Manifestation AVM with focal neurological deficit was detected in 26% and associated with deep AVM location (OR 4.16), localization in brainstem (OR 5.62), presence of perifocal gliosis an venous stasis (OR 1.91).

Conclusions: The angioarchitectural features of AVM have an important influence on the formation of clinical presentations.

Trial registration number: N/A

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