

Results: Our literature search identified 521 studies, out of which 20 were included. There were a total of 1750 patients who underwent CSDH drainage under LA. The weighted mean age was 71.0 years, and 27.1% were female. Postoperative complication rate was significantly lower in the LA group (odds ratio 0.44, $p = 0.004$). The mean operative time (mean difference -29.28 minutes, $p < 0.0001$) and length of admission (mean difference -1.58 days, $p = 0.0002$) were significantly shorter in the LA group. Conclusions: In this meta-analysis, LA shows benefits in shorter operative time, shorter admission length, and fewer postoperative complications. This makes local anesthesia a less invasive alternative to general anesthesia especially in elderly patients.

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Metabolic acidosis and functional outcome after aneurysmal subarachnoid hemorrhage: an exploratory analysis

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Background: Little data exists on the impact of metabolic acidosis in aneurysmal subarachnoid hemorrhage (aSAH). Given its detrimental effects in critically ill patients, we inquired whether in patients with aSAH, metabolic acidosis (bicarbonate < 22 mmol/L) was associated with an increased risk of worse outcomes at 3 months (mRS > 2). Methods: We performed a retrospective analysis of the CONSCIOUS-1 randomized control trial dataset including all patients who had at least three bicarbonate levels drawn. Bivariate and multivariate logistic regression models were used to assess for independent relationship between metabolic acidosis and functional outcome at 3 months. Delayed cerebral ischemia (DCI) was assessed for potential effect modification. Results: Three hundred and nineteen patients were included in our analysis. There was no difference in the proportion of poor outcome between those with or without metabolic acidosis on bivariate analysis (OR=1.022, $p=0.949$). However, amongst individuals who develop DCI, there was increased odds of unfavorable outcome when patients developed metabolic acidosis (OR=7.588, $p=0.023$). Conclusions: Individuals who develop delayed cerebral ischemia may benefit from having their bicarbonate level carefully monitored. More studies are needed to determine how the development of metabolic acidosis can be mitigated, and whether its prevention leads to improved outcomes.

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Delayed cerebral ischemia and cognitive outcomes after aneurysmal subarachnoid hemorrhage: an exploratory analysis

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Background: Neuropsychological outcomes are an important component of the morbidity after aneurysmal subarachnoid

hemorrhage (aSAH). Data on the relationship between delayed cerebral ischemia (DCI) and neuropsychological outcomes remains sparse. We herein assess the relationship between DCI and neuropsychological outcomes, as measured by the Montreal Cognitive Assessment score (MoCA) at 90 days in patients with aSAH. Methods: We performed a *post-hoc* analysis of the Nimodipine Microparticles to Enhance Recovery While Reducing Toxicity After Subarachnoid Hemorrhage (NEWTON-2) clinical trial. Patients were grouped based on whether they developed delayed cerebral ischemia. We assessed the relationship between MoCA scores and DCI with Student's t-test and regression modeling. Age, sex, history of hypertension, and WFNS grade were included as covariates in the model. Results: Two-hundred and fifteen patients were included in our analysis. Mean MoCA score at 90 days in our population was 22. Mean MoCA scores were significantly lower in patients who developed DCI compared to those who did not (23.7 vs 18.4, $p < 0.001$). Age, WFNS grade, and development of DCI were independently associated with MoCA scores in the regression model ($p < 0.05$). Conclusions: DCI is a predictor of decreased neuropsychological outcomes in aSAH survivors and may contribute to the morbidity burden in this population.

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Prediction of cerebral vasospasm using radiographical and clinical features: a machine learning model

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Background: Cerebral vasospasm is a feature of delayed cerebral ischemia that can occur after subarachnoid hemorrhage from cerebral aneurysm rupture. CTA is the universal first line diagnostic modality (sensitivity 79.6%, specificity 93.1%). We aim to determine whether specific vasospasm-associated radiographical and clinical features predicts cerebral vasospasm with comparable accuracy. Methods: Our cohort included 403 patients between 2006-2019. We used clinical predictive features including: day since rupture, transcranial doppler Lindegaard ratio, MCA velocity, ICA velocity, physical examination, and radiographical predictive features including: volume of hematoma, artifact, aneurysm, as our training dataset with true positives being digital subtraction angiography confirmed vasospasm. We used a decision-tree classifier from Scikit-learn library for training and testing of the model. Results: Our model trained on clinical and radiographical predictive features achieved sensitivity 93%, specificity 67%, F1 score 0.88. When using only radiographical features, we reached sensitivity 90%, specificity 55%, F1 score 0.83. When using only clinical features, we reach sensitivity 70%, specificity 93%, F1 score 0.87. Conclusions: We show that our vasospasm predictive model achieves adequate sensitivity, specificity, and F1 scores when compared to CTA. With further increase in dataset and fine-tuning of hyperparameters, it is possible that our model may be used to optimize the vasospasm management pipeline.