

P.177**Artificial intelligence-based outcome prediction for moderate to severe traumatic brain injury: a systematic review and methodological appraisal**

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Background: Artificial intelligence (AI) holds promise to predict outcomes for patients sustaining moderate to severe traumatic brain injury (msTBI). This systematic review sought to identify studies utilizing AI-based methods to predict mortality and functional outcomes after msTBI, where prognostic uncertainty is highest. **Methods:** The APPRAISE-AI quantitative evidence appraisal tool was used to evaluate methodological quality of included studies by determining overall scores and domain-specific scores. We constructed a multivariable linear regression model using study sample size, country of data collection, publication year and journal impact factor to quantify associations with overall APPRAISE-AI scores. **Results:** We identified 38 studies comprising 591,234 patients with msTBI. Median APPRAISE-AI score was 45.5 (/100 points), corresponding to moderate study quality. There were 13 low-quality studies (34%) and only 5 high-quality studies (13%). Weakest domains were methodological conduct, robustness of results and reproducibility. Multivariable linear regression highlighted that higher journal impact factor, larger sample size, more recent publication year and use of data that were collected in a high-income country were associated with higher APPRAISE-AI overall scores. **Conclusions:** We identified several study weaknesses of existing AI-based prediction models for msTBI; this work highlights methodological domains that require quality improvement to ultimately ensure safety and efficacy of clinical AI models.

NEUROVASCULAR AND NEUROINTERVENTIONAL

P.179**Delays in transfer of rural aneurysmal subarachnoid hemorrhage patients in British Columbia**

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Background: Treatment of aneurysmal subarachnoid hemorrhage (aSAH) in a high-volume center by experienced

cerebrovascular and neuroendovascular surgeons improves outcomes. We studied whether rural aSAH patients experience treatment delays in British Columbia. **Methods:** Vancouver Ruptured Aneurysm Database (VRAD) started in 2023 to prospectively capture consecutive aSAH patients at Vancouver General Hospital (VGH), an academic neurosurgical hospital with comprehensive stroke center capabilities. We included patients ≥ 18 years-old, presenting ≤ 72 h post-ictus and excluded untreated aneurysms and patients not residing in British Columbia. Patients were classified as rural or urban using the provincial government categorization of rurality. **Results:** We included 84 patients, 65.5% urban and 34.5% rural, with mean age 57.7 years (SD: 15.6) and 64.3% female. Aneurysm treatment consisted of 75% microsurgical clipping and 25% endovascular techniques. Median time from ictus to VGH was 5.9h [IQR: 2.6-16.6] urban and 13.2h [IQR: 8.3-27.8] rural, $p=0.001$. Median transfer time was 4.7h [IQR: 2.5-8.8] urban and 11.9h [IQR: 6.7-13.5] rural, $p=0.006$. Ictus to treatment time was 5.9h longer for rural patients, $p=0.077$. **Conclusions:** Rural aSAH patients in British Columbia take 7.3 hours longer to reach a neurosurgical center capable of comprehensive aneurysm treatment compared to urban patients. Improved inter-hospital transfer systems may reduce geographic disparities for aSAH in British Columbia.

P.181**Surgical results with low-grade arteriovenous malformations: a single center 16-year experience**

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Background: Advancements in AVM surgical techniques for cerebral arteriovenous malformation (AVM) underscore its efficacy. Our research aims to showcase the positive outcomes of treating low-grade AVMs surgically, focusing on safety and effectiveness. **Methods:** We retrospectively reviewed 55 patients with Spetzler-Martin (S-M) grade 1 and 2 AVMs who underwent surgical resection between January 2009 and December 2024. **Results:** In our study, 55 patients with S-M grade 1 and 2 AVMs underwent surgical resection, evenly divided between grades 1 (50.9%) and 2 (49.1%). Intracranial hemorrhage was the primary symptom in 74.5% of cases. Pre-operative Glasgow coma scale (GCS) scores revealed 69.1% of patients scored above 13, with 18% below 8. Successful resection was achieved in 87.3%. Postoperatively, 95.5% of ruptured and 90.9% of unruptured AVM patients showed lower or same modified Rankin scale scores. Poorer outcomes were significantly linked to lower GCS scores and intranidal/flow-related aneurysms. **Conclusions:** Our findings indicate surgical resection as a beneficial treatment for low-grade AVMs, yielding high cure rates and positive functional outcomes in both ruptured and unruptured cases. Preoperative GCS scores and the presence of associated aneurysms are predictive of postoperative functional status. Additionally, managing postoperative seizures effectively is key to enhancing prognosis.