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Movement medicine: A systematic review on the effect of early aerobic exercise initiation on symptom recovery following concussion

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Background: Mounting evidence supports aerobic exercise as a promising treatment option for individuals experiencing persistent post-concussion symptoms beyond four weeks. The purpose of this review was to determine whether initiating structured aerobic exercise within the early period (first two weeks) following concussion affects symptom recovery compared to standard care. **Methods:** A systematic literature search was performed using MEDLINE, Embase, PsycINFO and CENTRAL databases, combining keywords: (brain concussion, post-concussion syndrome, mild traumatic brain injury) AND (exercise, exercise therapy, physical activity, kinesiotherapy). Results were limited to Randomized Controlled Trials (RCTs). All selected articles underwent quality assessment. **Results:** The search generated 112 unique abstracts, of which 5 met inclusion criteria. Sample sizes ranged from 16 to 103 participants. Of the four studies that were able to analyze between-group differences, one showed significantly faster recovery in the early aerobic exercise group compared to control, while three showed no significant difference. Two studies demonstrated a trend toward faster initial symptom resolution in the early exercise group. **Conclusions:** Preliminary RCT evidence suggests that aerobic exercise initiated in the early postconcussion period does not exacerbate symptoms or prolong recovery time, and may potentially hasten recovery. Larger, more rigorous RCTs are required to define the optimal exercise parameters to facilitate symptom recovery.

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Willisian collateral and cervical carotid stenosis during large vessel occlusion stroke: Observations from computed tomography angiography

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Background: The circle of Willis (CoW) and cervical carotid arteries are important sources of collateral flow during acute large vessel occlusion (LVO) in the anterior circulation. We examined the anatomical components of the circle and the cervical carotid arteries to determine relationship to acute stroke severity.

Methods: Consecutive patients with acute LVO who underwent EVT were assessed. Measurements were made of the luminal diameters of 16 anatomical vascular components. Admission NIHSS, ASPECTS and mCTA collateral scores were statistically analyzed for any relationship to vascular measurements. **Results:** 100 patients were studied. No relationship was found between the collateral Willisian pathways and measures of stroke severity. However, the ophthalmic arteries exhibited a relationship to stroke severity. In adjusted analysis, 1-mm increases in the ipsilateral and contralateral ophthalmic artery diameter were independently associated with a 4.80-point decrease and a 6.31-point increase in the NIHSS scale, respectively. Similarly, a 1.53-point increase and a 2.62-point decrease in the ASPECTS. In the neck a majority showed 0-55% stenosis, with no stenosis between 55% and 95%, and 14% at 95% to 100%. **Conclusions:** Stroke severity and collateral during LVO is unrelated to Willisian collateral. Ophthalmic artery calibers are related. Acute progression of 55-95% stenoses to complete occlusion occurs in LVO stroke

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Evaluating outcome prediction models in endovascular treatment for acute ischemic stroke using baseline, treatment and post-treatment variables

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Background: Predicting outcomes after endovascular treatment (EVT) for acute ischemic stroke with baseline variables remains a challenge. We assessed the performance of stroke outcome prediction models for EVT in acute ischemic stroke in an iterative fashion using baseline, treatment-related and post-treatment variables. **Methods:** Data from the ESCAPE-NA1 trial were used to build 4 outcome prediction models using multivariable logistic regression: Model 1 included baseline variables only that are available prior to treatment decision-making, model 2 included additional treatment-related variables, model 3 additional early post-treatment variables, and model 4 additional late post-treatment variables. The primary outcome was 90-day modified Rankin Scale score 0-2. Model performance was compared using the area under the curve (AUC). **Results:** Among 1,105 patients, good outcome was achieved by 666 (60.3%). When using baseline variables only (model 1), the AUC was 0.74 (95% CI:0.71-0.77); this iteratively improved when treatment and post-treatment variables were added to the models (model 2: AUC 0.77,95%CI: 0.74-0.80, model 3: AUC 0.80,95%CI:0.77-0.83, model 4: AUC 0.82, 95%CI:0.79-0.85). **Conclusions:** Predicting EVT outcomes using baseline variables alone is inaccurate in one in four patients, and may be inappropriate for patient selection. Even the most comprehensive models with treatment-related and post-treatment factors involve considerable uncertainty.