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Spreading Depolarization After Chronic Subdural Hematoma Evacuation: Predictive Factors and Influence on Clinical Outcome

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Background and Objectives

- Chronic subdural hematoma (cSDH) is predicted to be the most common neurosurgical pathology by 2030.
- Recovery after evacuation is complicated by fluctuating neurological deficits in 25% of patients.
- Spreading depolarization (SD) may be responsible for these deficits.
- Here, we identify candidate risk factors for probable SD and assess the influence of probable SD on outcome.

Methods

- **Cohort 1** (n=40): patients with electrocorticographic (ECoG) monitoring. 15% (n=6) had definitive SD.
- **Cohort 2** (n=345): subjects who we suspected had probable SD determined by having post-operative neurological exam changes not otherwise explained. 23% had suspected SD.
- Indications for ECoG included suspected seizure (19.8%), encephalopathy (52.8%), aphasia (17%), motor deficit (7.5%), and cranial nerve deficit (2.8%). EEG was negative for seizure.
- We performed univariable logistic regression to identify factors associated with poor outcome as measured by Glasgow Outcome Scale (GOS) at first clinic visit and hospital length of stay (LOS).

Results

- 80/345 (23%) of subjects in cohort 2 had probable SD.
- Admission risk factors included hypertension, lower GCS, low SDH density and volume.
- Patients with known and suspected SD had longer lengths of stay and worse outcomes.

Discussion and Conclusions

- Patients with suspected SD have worse clinical outcomes independent of admission characteristics and severity of cSDH.
- Further work focused on identifying this high-risk population and developing targeted therapies is crucial.

Table 1: ECoG monitoring recording of SD. Note suppression of ECoG recording (arrows) with slow recovery over 15 minutes.

Table 2: Probable SD is independently predictive of longer hospital stay and worse clinical outcome.

References