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Impact of epileptic seizures in the neurological intensive care unit (NICU) on Glasgow Coma Scale (GCS)

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Background: Neurological patients frequently require glasgow coma scale monitoring at regular intervals. In intensive care units there are many patients admitted for monitoring of their consciousness. Seizures are associated with loss of consciousness if they are generalized. Quite often patients in the neurological intensive care units are monitored due to the underlying neurological disorder.The Glasgow coma scale is an extremely useful method of monitoring and prognosticating patients in the neurological ICU. Hence the occurrence of seizure with loss of consciousness might confound the assessment of Glasgow coma scale.

Materials and methods: It is a prospective observational study with a control arm. Subjects were enrolled if they had a seizure during admission to Intensive care unit (neurology and neurosurgery). Baseline GCS of all patients (n = 50) who develop/manifest a clinical seizure was monitored for 48 hours. Controls (n = 50) were matched with the baseline GCS of cases. The difference in GCS of both the patients at the specified interval was noted. Cases and controls are then compared on basis of their clinical profile and the assessment of GCS readings.

Results: Mean of the baseline GCS of cases was 10.44 (SD 3.79) and just after seizure was 5.82 (SD 2.96) at 2 hours was 7.8 (SD 3.87), at 4 hours was 8.48 (SD 4.21) , 8 hours was 8.74 (SD 4.44) ,12 hours was 8.9(SD 4.59), 24 hours was 8.86 (SD 4.62) and at 48 hours was 9.06 (SD). In controls mean of the baseline GCS is 10.5 and it remained 10.5.The most common time interval when the patient did return to the baseline Glasgow coma scale rating was 2 hours.

Conclusion: Seizure will confound the GCS of a patient but maximum will return to baseline consciousness level. Some patients did not return to baseline GCS and presence of status epilepticus in infectious or inflammatory encephalitis was important treatable cause.

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EEG Features for Outcome Prediction After Cardiac Arrest in Children

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Background: In-hospital cardiac arrest occurs in over 10,000 children per year in the United States, with high neurobehavioral morbidity amongst survivors. Early assessment of brain injury severity is important for neuroprognostication. However, clinical and resuscitation variables do not directly assess brain function and therefore may not optimally predict neurobehavioral outcomes. We aimed to determine which EEG features and feature combinations most accurately predicted short-term neurologic outcomes and survival in children resuscitated after cardiac arrest.

Methods: Prospective single-center observational study of children resuscitated from cardiac arrest who underwent conventional EEG monitoring with standardized EEG scoring. Logistic regression evaluated the marginal effect of each EEG variable or EEG variable combinations on the outcome. We identified the models with the highest areas under the receiver operating characteristic (AUROC), evaluated the optimal models using a 5-fold cross-validation approach, and calculated test characteristics.

Results: 89 children were evaluated. Unfavorable neurologic outcome (Pediatric Cerebral Performance Category score 4-6) occurred in 44 subjects (49%) including mortality in 30 subjects (34%). A model incorporating a four-level EEG Background Category (normal, slow-disorganized, discontinuous or burst-suppression, or attenuated-flat), Stage 2 Sleep Transients (present or absent), and Reactivity-Variability (present or absent) had the highest AUROC. Five-fold cross-validation for the optimal model predicting neurologic outcome indicated a mean AUROC of 0.75 (range 0.70-0.81) and predicting mortality indicated a mean AUROC of 0.84 (range 0.76-0.97). The specificity for unfavorable neurologic outcome and mortality were 95% and 97%, respectively. The positive predictive value for unfavorable neurologic outcome and mortality were both 86%.

Conclusions: The specificity of the optimal model using a combination of EEG features was high for unfavorable neurologic outcome and death. However, the positive predictive value was only 86% for both outcomes. Therefore, EEG data must be considered together with the overall clinical context.

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Factors predicting cessation of status epilepticus in clinical practice – data from a prospective observational registry (SENSE)

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Background: Several randomized controlled trials of the efficacy of initial status epilepticus (SE) treatment have estimated success