ELECTROENCEPHALOGRAPHIC CHANGES WITH INTRAVENTRICULAR CATHETER PLACEMENT IN PATIENTS ADMITTED TO A NEUROINTENSIVE CARE UNIT

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Introduction: Intraventricular catheters (IVC) are routinely placed in neurosurgical patients. Complications of insertion include misplacement, haemorrhage, infection and malfunction. Parenchymal changes including focal cortical oedema with local compression, as well as blood along the IVC path are reported and may have epileptogenic properties. The incidence of epileptogenic potentials or clinical seizures associated with IVC placement has not been studied, to our knowledge, but the incidence is presumed to be high. Further, local practice may be heterogeneous in its prescribing practices of antiepileptic drugs (AEDs) for patients with hydrocephalus requiring IVC placement.

Objectives: N/A

Methods: In order to better understand our practices and to inform future protocol development/quality improvement project, we reviewed the charts of 84 patients, admitted to our tertiary level ICU between January 2011 and 2013, who had an IVC placed and subsequently required monitoring with electroencephalography (EEG). The EEG data was read independently by an epileptologist unaware of the presence or absence of an IVC or the location of the IVC. Data collected included incidence of epileptogenic potentials and seizures localized to the cortex affected by the IVC, clinical indication for EEG (e.g. clinical seizure), prescribed AEDs, as well as other potential risk factors for the development of electroencephalographic changes.

Results: Median age of 55 years (Interquartile range, 44 – 66); 54 men (64%); 9 patients (11%) had a past medical history significant for having had a seizure; 18 (21%) had an IVC at the time of the EEG; 16 (19%) were not on antiepileptic drugs at the time of the EEG recording, 38 (45%) were on a single agent, and 23 (36%) were on more than one agent; aetiology of the hydrocephalus was ICH/IVH (33%), SAH (24%), TBI/stroke (15%), malignancy (14%), and CNS abscess/ menigitis/ ventriculitis (13%). In 46 (55%) of cases the IVC was successfully inserted on the first attempt, 7 (9%) required greater than one pass, and in 31 (37%) of cases the number of passes was not recorded. In 18 (23%) of cases, a spike and wave pattern was described, concordant with the location of the IVC. A previous history of seizure disorder was not associated with an increased risk of epileptiform activity (OR 0.94, 95% CI 0.16 – 5.49).

Conclusion: Epileptiform discharges hypothetically related to the IVC placement are not an uncommon occurrence. Further study will be undertaken to see if these epileptiform discharges are clinically significant and predispose to convulsive or nonconvulsive status epilepticus. Findings will inform the development of a protocol to improve our prescribing practices in this patient population.
References: N/A