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Selected abstracts from posters and short presentations at the 7th London-Innsbruck Colloquium on Status Epilepticus and Acute Seizures

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30-Day Re-admission After Status Epilepticus in Unites States: Insights From Nationwide Re-admission Database

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Background: Thirty-day readmission rates have increasingly gained importance as a quality metric for hospitals. Unplanned readmissions are associated with increased health care expenditure. However, there is paucity of data on 30-day readmission rates in patients with epilepsy, particularly those admitted for status epilepticus (SE). SE is often associated with prolonged hospitalization, multiple comorbidities, and cognitive deficits, all of which make these patients extremely vulnerable to repeated hospitalizations. The objective of this study was to determine the incidence, causes, predictors reasons, and costs of 30-day readmissions in patients admitted with SE from a large representative United States (US) cohort.

Methods: Adult (age ≥18 years) patients hospitalized with the primary diagnosis of SE (*International Classification of Diseases*-Ninth Revision-CM codes 345.2 or 345.3) between January 2013 and September 2015 who survived the index hospitalization were identified using the Nationwide Readmissions Database. Incidence, causes, and costs of 30-day readmissions were analyzed. Multivariable logistic regression model was used to identify independent predictors of 30-day readmissions.

Results: Of 42,232 patients with index SE, 6,372 (15.0%) were readmitted within 30 days. Intracranial hemorrhage (odds ratio [OR], 1.56; 95% confidence interval [CI], 1.12–2.18), psychosis (OR, 1.26, 95% CI, 1.05- 1.50), diabetes mellitus (OR, 1.12, 95% CI, 1.00- 1.25), chronic kidney disease (OR, 1.50, 95% CI, 1.31- 1.72), chronic liver disease (OR, 1.51; 95% CI, 1.24–1.84), >3 Elixhauser comorbidities (OR, 1.18; 95% CI, 1.06–1.31), length of stay >4 days during index hospitalization (OR, 1.41; 95%, CI, 1.26–1.56) and discharge to skilled nursing facility (OR, 1.14; 95% CI, 1.01–1.28) were independent predictors of 30-day readmission. The most common reason for readmission was convulsion/epilepsy (45.1%). Other non-epilepsy related readmissions were due to medical conditions; infection (9.7%), other CNS conditions (7.8%), respiratory disorders (5.1%), gastro-intestinal conditions (4.7%) and psychiatric illness (4.2%). Median length of stay and costs of readmission were 4 days (interquartile range, 2–7 days) and $7,882 (interquartile range, $4,649–15,012), respectively.

Conclusions: Thirty-day readmissions after status epilepticus occur in 15% of patients. Majority of these are related to recurrent seizures. Readmitted patients were more likely to have multiple comorbidities, longer length of stay, and discharge to skilled nursing home facility. Awareness of these predictors can help identify and target high-risk patients for interventions to reduce readmissions and costs.

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Factors related to the development of mesial temporal sclerosis after status epilepticus

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Background: There are relatively little data regarding mesial temporal sclerosis (MTS) as a sequela of prolonged seizure activity. This finding may be important to study epileptogenesis in status epilepticus (SE). Our aim is to study all factors related to the development of MTS in SE patients.

Methods: All our patients>16yo experiencing SE are prospectively recorded in a registry since 2011. The variables collected include demographics, etiology, SE type, refractoriness/duration, EEG pattern and neuroimaging. We selected those patients with no previous history of epilepsy and MRI during follow-up; we analyzed all factors in relation to development of MTS.

Results: We evaluated 52 patients. Mean age: 59yo; 27(51.9%) male. 25(48.1%) were without prominent motor symptoms. Median mSTESS: 3. Regarding etiology: 32(61.5%) were acute symptomatic, 9(17.3%) remote symptomatic, 8(15.4%) progressive symptomatic and 3(5.8%) cryptogenic. LPDs were present in 14(26.9%). 29(55.8%) were considered refractory. 24 patients had a brain injury affecting temporal lobe, and 28 had other affected lobes or no brain injury. MRI was performed between 1.5 and 24 months after SE. MTS was

observed in 19(36.5%). When analyzing its development, MTS was clearly more frequent in brain lesions affecting the temporal lobe (p = 0.0001), with some etiologies such a remote cerebrovascular disease/brain injury (p = 0.001) or an acute CNS infection (p = 0.014), with higher EMSE scores (p = 0.011), and when LPDs were present (p = 0.002); furthermore, we observed a tendency in older patients (p = 0.089). After a multivariate analysis, the factors predicting the development of MTS were the presence of a lesion in temporal lobe (p = 0.003), and specific etiologies: a remote cerebrovascular lesion or traumatic brain injury (p = 0.002) and an acute CNS infection (p = 0.031). In 43 patients, an acute MRI was also performed, 19 (44.2%) showed changes related to SE in DWR and 30 (69.8%) in T2; when MRI acute changes were included in regression, the presence of a lesion in temporal lobe (p = 0.046) and a remote vascular or traumatic lesion (p = 0.016) remained as predictors of MTS, in addition to the finding of acute post-SE changes in DWR (p = 0.091).

Conclusion: In SE patients, the development of MTS was related with specific etiologies and the location of the brain insult.

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Prolonged Seizures in Children

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Background: Prolonged seizures (PS) in children carry significant risk of morbidity and mortality. Previous work has predominantly focused on status epilepticus ≥30min but a new ILAE definition has been produced following evidence that seizures ≥5min are associated with negative outcomes. There has been increasing effort by clinicians and epilepsy specialist nurses to manage PS effectively through benzodiazepines, education and training. This study aims to provide population-based data on children presenting with PS and their outcomes.

Methods: All children presenting to accident and emergency (A + E) between 2011-2017 from a Scottish Children's hospital were identified (capture-recapture method with multiple datasets). Data was collated from electronic health records; including patient demographics, clinical characteristics, acute seizure management and outcomes. This data can be used to study long-term outcomes, including educational outcome, through national data linkage systems.

Results: There were 666 children (1234 seizure episodes). These accounted for 0.38% (95% CI (0.34-0.42%)) of A + E admissions. Yearly prevalence rate was 0.8 per 1000 children. The median age was 3.65 years (range 0-20 years) and 54% of children were male (95% CI (53.1-60.7%)). The median seizure duration was 10 minutes (range 5 to 195 minutes). PS incidence increased at the extremes of socioeconomic status and relationship with distance from A + E can be determined. Seizure duration, mortality and requirement for ventilatory support decreased compared to historical data. Data highlighted children with epilepsy and those in specialist education as two particularly at risk groups for recurrent prolonged seizures. There was a lower likelihood of hospital admission where buccal midazolam was administered.

Conclusions: Adverse outcomes have decreased and the use of buccal midazolam is promising. Identifying high-risk groups provides opportunity for early intervention. This data forms the basis for extensive evaluation of acute seizure management and monitoring long-term outcomes.

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Long-term Safety and Efficacy of Add-on Cannabidiol (CBD) Treatment in Patients with Lennox Gastaut Syndrome in an Open-label Extension Trial (GWPCARE5)

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Background: Lennox-Gastaut syndrome (LGS) is a rare epileptic encephalopathy that is often treatment-resistant. The efficacy of cannabidiol (CBD) was demonstrated with an acceptable safety profile in two Phase 3 randomised controlled trials (RCTs): GWPCARE3 (NCT02224560) and GWPCARE4 (NCT02224690). A second interim analysis of the open-label extension (OLE) of the two RCTs was conducted to assess long-term safety and efficacy of add-on CBD treatment in patients with LGS.

Methods: Patients who completed a 14-week, double-blind, randomised controlled trial (GWPCARE3/NCT02224560; GWPCARE4/NCT02224690) could enter this OLE trial (GWPCARE5/NCT02224573). Patients received GW Pharmaceuticals' formulation of plant-derived highly purified CBD in oral solution (100 mg/mL) for ≤3 years. Primary endpoint was safety. Secondary endpoints were drop and total seizure frequency, and Subject/Caregiver Global Impression of Change (S/CGIC).

Results: Overall, 99% (366/368) of eligible patients with LGS entered the OLE trial. Median follow up was 61 weeks (3 days to 87 weeks); 88 patients (24%) withdrew. Mean age: 16 years; 33% ≥18 years; 54% male. Baseline median seizure frequency/28 days: 80 drop seizures; 168 total seizures. During the extended follow up, adverse event (AE) incidence: 94%; serious AE incidence: 33%; 11% discontinued owing to AEs. Most common AEs (≥20%): diarrhoea, convulsion, somnolence, pyrexia, vomiting and decreased appetite. Forty-seven patients (13%) had elevations in liver transaminases >3× upper limit of normal; 35 (74%) were taking concomitant valproate. There were 5 deaths; none deemed treatment-related by the investigator(s). Median percentage reductions in seizure frequency (12-week windows over 72 weeks): 48–70% for drop seizures; 48–63% for total seizures. Approximately 88% of patients/caregivers reported an improvement in overall condition on the S/CGIC at Weeks 24 and 48.

Conclusions: Long-term add-on CBD treatment had a similar AE profile to that observed in the core studies at 14 weeks. Reductions in drop and total seizure frequency and improvements in overall condition were maintained through 72 weeks.