A.4

Entropy on routine EEG: an interictal marker of seizure frequency?

É Lemoine (Montreal)* *J Tessier* (Montreal) *G McDuff* (Montreal) *M Robert* (Montreal) *D Toffa* (Montreal) *F Lesage* (Montréal) *DK Nguyen* (Montreal), *E Bou Assi* (Montreal)

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Background: Sample entropy (SampEn) can quantify the unpredictability of a physiological signal. We sought to assess if SampEn on EEG could reflect recent seizure activity. Methods: Charts of all patients undergoing an outpatient EEG between January and March 2018 were reviewed to assess seizure occurrences in the follow-up period between the two clinical visits surrounding the EEG. 9s-EEG segments were extracted at prespecified time points. SampEn was calculated for all segments and values aggregated at the 25thpercentile. We performed a multivariate zero-inflated analysis to test the association between SampEn and seizure rate around the EEG, after controlling for age, presence of IED, presence of abnormal slowing, and presence of a focal brain lesion. Results: 269 EEGs were screened and 133 met inclusion criteria (112 patients). 80 EEGs (60%) were from patients with epilepsy, of which 47 had at least one seizure within the year preceding the EEG. Remaining EEGs were from patients who were deemed not to have epilepsy at last follow-up. Each 1SD decrease in SampEn was associated with a 3.93-fold increase in the rate of daily seizures (95% CI: 1.19–12.99, p = 0.02). Conclusions: Sample entropy of EEG is a potential objective method to assess contemporary seizure occurrence.

A.5

Neuropathology of eight cases of the New Brunswick cluster of Neurological Syndrome of Unknown Cause (NSUC)

GH Jansen (Ottawa)* *AK Miller* (Winnipeg) *AS Easton* (Halifax), *JM Woulfe* (Ottawa)

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Background: In March 2021, at a press conference, the presence of a cluster of patients, claimed to have a novel neurological syndrome, was announced in New Brunswick. These patients were suggested to have symptoms reminiscent of CJD. The onset of disease was between 2015 and 2021. The size of this cluster has been reported as approximately 50 cases. Further news publications have suggested that various environmental factors were causing this disease. Methods: Between 2019 and 2021 eight patients have died in this cluster. Their neuropathological findings are reported here. Results: There was one case of metastatic carcinoma, one case of FTLD-TDP43, one case of neocortical Lewy body pathology, one case of neocortical Lewy body pathology and AD, 2 cases of AD with vascular pathology, one case of mainly vascular pathology, and one case without significant pathology (consistent with patient's history). In all these patients no evidence for a prion disease was found, nor novel pathology. Conclusions: We suggest that these 8 patients represent a group of misclassified clinical diagnoses. Classical probability theorem based statistical evaluation shows that this group of deceased patients is representative for the entire cluster at a p=0.0001 level, which would suggest that the entire cluster is based on misdiagnoses.

Chair's Select Abstracts - Neurosurgery/Neuroradiology/Stroke (CNSS/CSNR/CSC)

B.1

Can quantitative susceptibility mapping help diagnose and predict recovery of concussion in children?

N Sader (Calgary)* *D Gobbi* (Calgary) *B Goodyear* (Calgary) *R Frayne* (Calgary) *M Beauchamp* (Montreal) *WR Craig* (Edmonton) *Q Doan* (Vancouver) *R Zemek* (Ottawa) *KO Yeates* (Calgary), *J Riva-Cambrin* (Calgary)

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Background: Quantitative susceptibility mapping (QSM) is an MR sequence that has potential as a biomarker in concussion. We compared QSM in pediatric concussion patients versus a comparison group of children with orthopedic injuries (OI) and assessed QSM's performance relative to the current clinical benchmark (5P risk score) for predicting persistent postconcussion symptoms (PPCS). Methods: Children (*N*=967) aged 8-16.99 years with either concussion or OI were prospectively recruited from 5 Canadian centers. Participants completed QSM at a post-acute assessment 2-33 days post-injury. QSM z-score metrics for 9 regions of interest (ROI) were derived from 371 children (concussion=255, OI=116). PPCS at 1-month post-injury was defined using reliable change methods. Results: The concussion and OI groups did not differ significantly in QSM across ROI. Increased frontal white matter (WM) susceptibility predicted reliable increases in parent-rated cognitive symptoms (p=0.001). Together, frontal WM susceptibility and the 5P risk score were better at predicting persistent cognitive symptoms than the 5P risk score alone (p=0.0021). AUC were 0.71 (95%CI: 0.62-0.80) for frontal WM susceptibility, 0.67 (95%CI: 0.56-0.78) for the 5P risk score, and 0.73 (95%CI: 0.64-0.82) for both. Conclusions: This is the first study to demonstrate a potential imaging biomarker that predicts persistent symptoms in children with concussion compared to the current clinical benchmark.

B.2

Does gender equality exist in the surgical management of degenerative lumbar disease?

MA MacLean (Halifax)* *CJ Touchette* (Sherbrooke) *J Han* (Halifax) *SD Christie* (Halifax), *G Pickett* (Halifax)

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Background: Despite efforts toward gender equality in clinical trial enrollment, females are frequently underrepresented and gender-specific data analysis is often unavailable. The purpose