

## CNS/CSCN CHAIR'S SELECT ABSTRACT PRESENTATIONS

### B.01

CNS Andre Barbeau Memorial Prize

#### Age as a key determinant of inflammatory response, glial and axonal survival after traumatic spinal cord injury

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**Background:** This study examines whether age is a key determinant for inflammatory response, oligodendroglial apoptosis and axonal survival after traumatic spinal cord injury (SCI). **Methods:** This study includes post-mortem spinal cord tissue from 64 cases of SCI (at cervical or high-thoracic level) and 38 controls cases. Each group was subdivided into younger and elderly individuals ( $\geq 65$  years). Alternating sections from 2 to 3 segments caudal to SCI and age/sex/level-matched segments from controls were stained for: (i) neuroinflammation (neutrophils, macrophages, lymphocytes); (ii) apoptotic oligodendrocytes; (iii) axons; (iv) extent of degeneration. The number of cells or axons was counted in the motor and sensory areas within the spinal cord using unbiased stereological techniques. **Results:** Younger and elderly individuals had statistically similar number of inflammatory cells in most of the stages post-SCI. Younger and elderly individuals had similar number of oligodendrocytes in apoptosis in all stages following SCI. The number of preserved axons did not significantly differ between younger and elderly individuals with SCI and without prior CNS injury. Extent of degeneration within the spinal cord white matter did not significantly differ between the two groups. **Conclusions:** Our results indicate that age at the time of injury does not adversely affect the cellular inflammatory response, oligodendroglial apoptosis and axonal survival after traumatic SCI.

### B.02

CNS Francis McNaughton Memorial Prize

#### Blood hemoglobin concentration as a potential predictor of outcomes after acute ischemic stroke

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**Background:** This study examines whether abnormal blood hemoglobin concentration (bHB) is associated with worse clinical outcomes and poorer prognosis after acute ischemic stroke. **Methods:** We included data from the Registry of the Canadian Stroke Network on consecutive patients with ischemic stroke who were admitted between July/2003 and March/2008. Patients were divided into groups as follows: low bHB, normal bHB, and high bHB. Primary outcome measures were the frequency of moderate/severe strokes on admission (Canadian Neurological Scale:  $< 8$ ), greater degree of disability at discharge (modified Rankin score: 3-6), and 30-day and 90-day mortality. **Results:** Higher bHB than the superior normal limit is associated with greater degree of impairment (OR=1.45, 95%CI: 1.06-1.95,  $p=0.0195$ ) and disability (OR=1.49, 95%CI: 1.03-2.15,  $p=0.0331$ ), and higher 30-day mortality (HR=1.98, 95%CI: 1.44-2.74,  $p<0.0001$ )

after adjustment for major potential confounders. The Kaplan-Meier curves indicate that abnormal bHB is associated with higher mortality after acute ischemic stroke ( $p<0.0001$ ). Lower bHB than the inferior normal limit is associated with longer stay in the acute stroke care center (OR=1.11, 95%CI: 1.02-1.22,  $p=0.017$ ). **Conclusions:** Polycythemia on the initial admission is associated with poorer prognosis regarding the degree of impairment and disability, and 30-day mortality after an acute ischemic stroke. Anemia on admission is associated with longer stay in the acute stroke center.

### B.03

#### Laboratory and clinical adverse events following initiation of dimethyl fumarate

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**Background:** Dimethyl fumarate (DF) is a first line therapy for relapsing remitting multiple sclerosis (RRMS). This retrospective cohort study aims to determine adverse events (AEs) after initiation of DF in a real world clinical setting. **Methods:** Data from patients at the Calgary MS Clinic with RRMS who initiated DF between July 1, 2013 and December 31, 2014 were analyzed. Demographic, clinical and lab information were collected from patient electronic medical records and the clinic database. **Results:** This analysis included 170 patients. At treatment initiation mean age was 42.1 years, 75% were women, mean disease duration was 12.5 years, median EDSS was 2.0, and 24% were treatment naïve. Median follow-up was 6.4 months (range: 1.5-17.7). AEs occurred in 101 (59%); the most common were flushing (31%), gastrointestinal (GI) side effects (24%), and elevated liver enzymes (18%). Other less frequent AEs included lymphopenia (lymphocyte count  $< 0.5$ ) (4%) and proteinuria (4%). DF was discontinued by 17 (10%); median time to discontinuation was 3.1 months. Fifteen (9%) discontinued due to AE. **Conclusions:** AE associated with DF in a real world clinical setting is comparable to the Canadian monograph for flushing, GI side effects, and lymphopenia but lower for elevated liver enzymes and proteinuria.

### B.04

#### Understanding the evolution of epilepsy – the value of collecting longitudinal data in the setting of a first seizure clinic

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**Objective:** Our knowledge of disease mechanisms in epilepsy is biased by findings originating from cross-sectional studies and advanced stages of epilepsy. We provide a new perspective by collecting systematically longitudinal data from patients who present in early stages (ES). **Methods:** The Halifax First Seizure Clinic, founded in 2008, uses a comprehensive multimodal data basis addressing clinical presentation, neuroimaging, EEG findings, genetics, cognition, comorbidities, social parameters, and life style. Follow-up visits are 6, 12 and 24 months. **Results:** Out of 575 patients we identified 3 subgroups 1) Strictly first seizure,  $n=187$ , 2) New-onset epilepsy ( $> 1$  seizure  $< 12$  months),  $n=149$ , and 3) Newly-diagnosed epilepsy

(seizures > 12 months), n=50. 189 patients were excluded (not proven seizure or other conditions e.g syncope etc.). Our interim analyses suggest: A) pharmacoresistance presents in highly diverse patterns and is rarer than expected in ES, B) Congenital malformations seem to have an excellent treatment prognosis in ES, C) Marijuana consumption is significantly more prevalent at initial assessment (comparison general population), D) Preceding psychiatric comorbidities associated with reduced amygdalar volume may be a predictor for seizure recurrence. *Conclusions:* The preliminary and illustrative findings of our pilot study challenge current concepts of disease evolution in epilepsy.

## B.05

### Potential effect of amyloid imaging on diagnosis and intended management of patients with cognitive decline: impact of appropriate use criterion

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*Background:* Appropriate use criteria (AUC; Johnson et al, 2013) provide guidelines for selecting patients for whom amyloid PET could be useful. This study evaluated the impact of amyloid PET on diagnosis/management in patients likely to meet AUC. *Methods:* We examined 229 cases from a completed study of florbetapir amyloid PET (FBP-PET) in patients with a cognitive decline evaluation in whom Alzheimer's Disease (AD) was suspected, but with <85% confidence in the diagnosis. All cases received a provisional diagnosis and management prior to FBP-PET. Information for 172 cases after 3-months' follow-up was also available on actual diagnosis/management post-FBP-PET. Cases were classified as likely meeting AUC (AUC-like) or not. *Results:* 125/229(55%) subjects were AUC-like. NonAUC cases included typical AD, Mild Cognitive Impairment (MCI) due to AD, Cognitive Decline without objective evidence of impairment (CD) and dementia or cognitive impairment with specific nonAD diagnosis. 59/125(47%) AUC-like cases were amyloid positive (Aβ+). Among nonAUC cases, 29% (CD), 49%(MCI due to AD), 53%(non-AD) and 73%(typical AD) were Aβ+. Of 172 cases with follow-up information, diagnosis/management changed after FBP-PET in 58%/88% and 45%/77% of AUC-like and nonAUC, respectively. *Conclusions:* FBP-PET altered diagnosis/management in patients selected according to AUC. Additionally, AUC generally excluded patients with a relatively high (typical AD) or low (CD) probability of Aβ+ scan.

## B.06

### Long-term outcomes in the management of painful diabetic neuropathy

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*Background:* Painful diabetic neuropathy (PDN) is a frequent complication of diabetes mellitus. Current treatment recommendations

are based on short-term trials, generally of duration ≤3 months. Limited data are available on the long-term outcomes of this chronic disease. This study aims to determine the long-term clinical effectiveness of the management of chronic PDN at tertiary pain centres. *Methods:* From a prospective observational cohort study of patients with chronic neuropathic non-cancer pain recruited from seven Canadian tertiary pain centres, 43 patients diagnosed with PDN were identified for analysis. Data were collected according to Initiative on Methods, Measurement, and Pain Assessment in Clinical Trials (IMMPACT) guidelines including Brief Pain Inventory (BPI). *Results:* At 12-month follow-up, 37.2% of 43 patients achieved pain reduction of ≥30%, 51.2% achieved functional improvement with a reduction of ≥1 on the Pain Interference Scale (0-10, BPI), and 30.2% (95% CI: 17.2% to 46.1%) had achieved both these measures. Symptom management included at least 2 medication classes in 55.3%, and 3 medications classes (opioids, antidepressants, anticonvulsants) in 25.5%. *Conclusions:* A sizable minority of patients being managed for PDN in a tertiary care setting achieve meaningful improvement. Polypharmacy, including analgesic antidepressants, anticonvulsants and opioids, is often necessary to attain symptom management.

## B.07

### Concordance rate between Wada and fMRI tests for visual memory assessment of patients with medically intractable temporal lobe epilepsy

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*Background:* There is not enough evidence to prove either invasive Wada or non-invasive fMRI test predicts postoperative memory changes more accurately in patients with refractory temporal lobe epilepsy (TLE). In this study, concordance between fMRI and Wada test for postoperative assessment of visual memory is investigated. *Methods:* fMRI test with a novel scene-encoding task were conducted on our cohort of patients. fMRI laterality indices (LI) were then defined as a ratio (L-R)/(L+R) between the number of activated voxels in the left and right of two regions: hippocampus+parahippocampus (Region A) and temporal lobe - (hippocampus+parahippocampus) (Region B). fMRI results were divided into the right (LI < -0.2), left (LI > 0.2) or bilateral (-0.2 < LI < 0.2) hemispheric memory dominance and compared to the results of the Wada test. *Results:* 19 patients were studied (14 left TLE, 3 right TLE and 2 bilateral TLE). The concordance rate between Wada and fMRI tests was 36.8% and 42.1% for regions A and B. *Conclusions:* Based on the results, the concordance rate between the Wada test and the fMRI test is not high. As a future work, we will investigate the correlation of each test to postoperative memory outcome.