CNS André Barbeau Memorial Prize

Network connectivity following a single unprovoked seizure using 7 Tesla resting-state fMRI

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Background: Predicting epilepsy following a first seizure is difficult. Network abnormalities are observed in patients with epilepsy using resting-state functional MRI (rs-fMRI), which worsen with duration of epilepsy. We use rs-fMRI to identify network abnormalities in patients after a first seizure that can be used as a biomarker to predict development of epilepsy. Methods: Patients after a single, unprovoked seizure and age/sex matched healthy controls underwent 7 Tesla structural and resting-state functional MRI. Data were analyzed using graph theory measures. Patients were followed for development of epilepsy. Results: Nine patients and nine control subjects were analyzed. There were no differences in baseline characteristics. No patients developed epilepsy (average follow-up 3 months). No differences between groups occurred on a whole-brain network level. At a 20% threshold, significant differences occurred in the default mode network (DMN). Patients demonstrated an increased local efficiency (p=0.02) and clustering coefficient (p=0.04), and decreased path length (p=0.02) and betweenness centrality (p=0.02). Conclusions: No whole-brain network changes occur after a single unprovoked seizure. No patient has developed epilepsy suggesting this group does not have network alterations after a single seizure. In the DMN, the alterations noted indicate increased segregation of network function.

CANCN Chair’s Select Abstracts

A.01

The relationship between fatigue and health-related quality of life in a clinical trial population of Duchenne muscular dystrophy patients

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Background: Fatigue was recently reported to be the largest contributor to poor health-related quality of life (HRQOL) in paediatric Duchenne muscular dystrophy (DMD). Additional studies are necessary to confirm the generalizability of this finding. Our objective was to explore the longitudinal relationship between fatigue and HRQOL in an additional cohort of DMD patients. Methods: We performed a secondary analysis of data from a clinical trial (NCT00592553), which enrolled patients with nonsense mutation DMD, aged 5–20 years, from 37 sites in 11 countries (N=174). Fatigue and HRQOL were assessed using the PedsQL Multidimensional Fatigue Scale and Generic Core Scales, respectively, by patient- and parent-report at baseline and over 48 weeks. Results: Patients reported greater fatigue than healthy controls from published data. There was no significant difference between patient- and parent-reported fatigue. Fatigue was significantly correlated with worse HRQOL at baseline, by patient-report (r=0.70, P<0.001) and parent-report (r=0.70, P<0.001); and at 48 weeks, by patient-report (r=0.79, P<0.001) and parent-report (r=0.74, P<0.001). Change in fatigue was significantly correlated with change in HRQOL over 48 weeks, by patient-report (r=0.64, P<0.001) and parent-report (r=0.67, P<0.001). Conclusions: Fatigue is a major contributor to HRQOL in DMD. The strong association between fatigue and HRQOL corroborates previous studies, and suggests that reducing fatigue may improve HRQOL.

A.02

Assessing visual functions in children with an optic pathway glioma using steady-state visual evoked potentials

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Background: Optic pathway gliomas (OPG) represent 5% of pediatric brain tumours. Visual acuity measures are used to evaluate treatment response. Current clinical tests to assess visual field integrity are subjective and require verbal cooperation. Thus, the objective of this study was to evaluate the clinical effectiveness of Steady State Visual Evoked Potentials (ssVEPs) to measure visual field integrity.