019 DIFFERENTIATING STATUS EPILEPTICUS FROM PROLONGED PSYCHOGENIC NON-EPILEPTIC SEIZURES – CAN PERIPHERAL CELL RATIOS HELP?

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Objectives Differentiating status epilepticus (SE) from prolonged episodes of psychogenic non-epileptic seizures (PNES) is not always straight forward and treatment paradigms are dichotomous with potential for harm from misdiagnosis. This study aims to identify the utility of the neutrophil-to-lymphocyte ratio (NLR), neutrophil-to-monocyte ratio (NMR), monocyte-to-lymphocyte ratio (MLR) and platelet-to-lymphocyte ratio (PLR) in differentiating between SE and PNES.

Methods Retrospective case control study in adults presenting to a tertiary hospital between April 2017 and December 2020. SE was defined as per ILAE criteria for time point 1. PNES events needed to meet the same time criterion. Patients were excluded if they had other factors that altered peripheral cell counts. After screening 1052 cases, 69 SE events from 56 patients and 38 prolonged PNES events from 22 patients were analysed.

Results NLR, NMR, MLR and PLR were all significantly higher in SE compared with PNES with mean values of 6.91 vs 2.09, 11.03 vs 7.94, 0.59 vs 0.27 and 189.7 vs 102.3, respectively. Using receiver operating curves, cut off values for NLR, NMR, MLR and PLR of >3.175, >9.36, >0.435 and >129.5 respectively were identified, yielding sensitivities and specificities of 60.87% and 89.47%, 53.62% and 78.95%, 56.5% and 94.7%, 59.42% and 86.84% respectively. AUC ranged from 0.689 to 0.7931.

Conclusion Patients with SE had significantly higher peripheral cell ratios than those with PNES. When the diagnosis is in doubt, elevated cell ratios can be used to increase diagnostic certainty. However, where cell ratios are not elevated, further investigations are required.

020 REAL-TIME CAPTURE OF PATIENT-REPORTED OUTCOMES USING A DIGITAL PLATFORM – A PILOT STUDY

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Objectives To demonstrate proof of concept/feasibility of a novel digital platform using real-time capture of patient-reported outcomes for real-world research involving patients with epilepsy.

Methods The phone app collects multi-faceted patient-reported outcomes including seizure frequency, medication side effects, mood, anxiety, quality of life and cognition along with voice and digital images. Patients are invited through a national consortium of 18 adult epilepsy centres in Australia. The patient-reported information potentially allows feedback to their treating specialists and tertiary centre in near real-time, along with deidentified aggregation across all participating centres for comparison. Currently, more than 40 patients are enrolled. We present the outcomes of one patient, with the longest-running data points. The new platform was developed by Key-Lead Health TM, Melbourne Australia.

Results The results report a single patient's composite scores for mood, sleep, cognition seizures and medication side-effects from the first 1.5 months.

Conclusions Our digital phone platform has the potential to facilitate the more effective and efficient capture of longitudinal data enhancing real-world research data integrity along with patient and specialist engagement.

Table: Patient reported outcomes for single patient captured using digital phone app date 4/1 7/1 10/1 15/1 20/1 1/2 15/2 18/2

Side effects 4.5 3.8 3.4 3.4 3.4 3.4 3.3 3.8

Memory 9 1 7 5 5 6 7 6

Seizures 3 0 0 1 1 1 2 0

Reaction time 7.7 7.1 12.4 7.0 7.7 7.7 7.9 6.7

Mood 17 16 15 15 12 15 18 16

Sleep 12 6 8 4 3 10 8 5

021 RELATIONSHIPS BETWEEN COGNITIVE IMPAIRMENT AND CLINICAL FEATURES OF IDIOPATHIC INTRACRANIAL HYPERTENSION

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Objective To determine whether cognitive impairments in patients with Idiopathic Intracranial Hypertension (IIH) are correlated with changes in visual processing, weight, waist circumference, mood or headache and whether they change over time.

Methods Twenty-two newly diagnosed IIH patients participated, with a subset assessed longitudinally at 3 and 6 months. Both conventional and novel ocular motor tests of cognition were included: Symbol Digit Modalities Test (SDMT), Stroop Colour and Word Test (SCWT), Digit Span, California Verbal Learning Test (CVLT), prosaccade (PS) task, antisaccade (AS) task, interleaved antisaccade-prosaccade (AS-PS) task. Patients also completed headache, mood and visual functioning questionnaires.

Results IIH patients performed more poorly than controls on the SDMT ($p<.001$), SCWT ($p=.021$), Digit Span test ($p<.001$) and CVLT ($p=.004$) at baseline, and generated a higher proportion of AS errors in both the AS ($p<.001$) and AS-PS tasks ($p=.007$). Further, IIH patients exhibited prolonged latencies on the cognitively complex AS-PS task ($p=.034$). While weight, waist circumference, headache and mood did not predict performance on any experimental measure, increased retinal nerve fibre layer (RNFL) was associated with AS error rate on both the block ($F(3, 19)=3.22$, $B=0.30$, $p=0.022$) and AS-PS task ($F(3, 20)=2.65$, $B=0.363$,

$p=0.013$). Unlike ocular motor changes, impairments revealed on conventional tests of cognition persisted up to 6 months.

Conclusions We found multi-domain cognitive impairments in IIH patients that were unrelated to clinical features. Marked ocular motor inhibitory control deficits were predicted by RNFL thickness but remained distinct from other cognitive changes, underscoring the significance of visual processing changes in IIH.

022 NITROUS OXIDE INDUCED MYELO-NEUROPATHY

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Background Nitrous oxide misuse is a recognized issue worldwide. It is cheap, legal and can be bought in bulk online. Prolonged misuse inactivates vitamin B12 causing a myelo-neuropathy.

Methods Review of 20 patients with nitrous-oxide induced myelo-neuropathy from tertiary hospitals between 2016-2020

Results Twenty patients had an average age of 25 years. Mean canister consumption was 150 per day for 9 months. At presentation paraesthesia and gait unsteadiness were common, and six patients were bedbound. Mean serum B12 was normal: 258 pmol/L(NR=140-750) as was active B12: 94 pmol/L (N>35). In contrast mean serum homocysteine was high: 51 umol/L(NR=5-15). Spinal MRI(n=19) showed characteristic dorsal column T2 hyperintensities. Nerve conduction studies (n=5) showed a lower limb predominant axonal sensorimotor neuropathy. Patients were treated with intramuscular vitamin B12, with variable functional recovery at discharge. Three of 6 patients who were bedbound at presentation were able to walk with an aid at discharge. Of 8 patients with follow-up, most had persistent paraesthesiae and/or sensory ataxia. Admission and discharge mobility scores were not significantly correlated with serum total and active B12 levels or cumulative nitrous oxide use. However, there was an inverse trend for decreased serum active B12 level with increased cumulative nitrous oxide use (Spearman's rho -0.416, $p=0.09$).

Conclusion Nitrous oxide misuse can cause severe but potentially reversible subacute myelo-neuropathy. Serum and active B12 can be normal, while elevated homocysteine and dorsal column high T2 signal on MRI imaging strongly support the diagnosis. Neurological deficits can improve with abstinence and B12 replacement, even in the most severely affected patients.

023 DEVELOPMENT OF A BEDSIDE MOTION CAPTURE SYSTEM: A PILOT STUDY

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Objectives Pronator drift is one of many clinical signs that would benefit from detailed study, but this requires accurate measurement of movement in three dimensions. The Vicon system is currently considered to be the gold standard for measurement of limb kinetics in a movement analysis lab but it cannot be used at the bedside for many reasons. This study aimed to investigate a portable camera-based motion capture system (MCS) as a clinically-useful alternative.

Methods The MCS used two commercially-available cameras arranged so as to permit stereoscopic calculation of depth (i.e. distance from the cameras), and therefore a 3-D representation of movement at the shoulder, elbow and wrist. Data were obtained simultaneously from both movement capture and Vicon systems while three normal subjects simulated four scenarios of the pronator drift test in each limb. Outputs from Vicon and MCS were analysed using Matlab to determine root mean square error (RMSE) in XYZ coordinates. *A priori*, an acceptable difference was considered to be an average RMSE of < 10 mm.

Results Collectively, the studies generated 53,424 sets of data. The average RMSE in the XYZ axis was 14.9 mm (range 5.0-20.3 mm). Inaccuracy was greatest at the wrist during trials involving larger degrees of pronation.

Conclusion The motion capture system was able to generate a 3-D trajectory of limb motion but further refinement is needed before it can be used for the purposes of clinical measurement.

024 ANDERSEN-TAWIL SYNDROME: MULTI-SYSTEM DEEP PHENOTYPING OF A LARGE UK COHORT

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Background Andersen-Tawil Syndrome (ATS) is a rare channelopathy caused by mutations in the *KCNJ2* gene that encodes the ubiquitously expressed Kir2.1 potassium channel.

Methods In our paper, we describe key findings in a large UK cohort of 52 patients, pertinent to the diagnosis and management of ATS. We report a new point prevalence of 0.105 per 100 000 (increased from 0.08 per 100 000).

Results While ATS has historically been considered a triad of episodic weakness, cardiac arrhythmias and dysmorphic features, we show that there is considerable variability to this phenotype. Pure cardiac or muscle phenotypes may exist. The absence of dysmorphic features does not exclude the diagnosis. Similarly, a normal long exercise test was seen in five patients.

Importantly, we identify that the phenotype includes a significant risk of cardiac morbidity and mortality with 13% of our cohort requiring cardiac defibrillator or pacemaker insertion and an additional 23% reporting syncope. Syncope has been recently associated with an increased risk of life threatening arrhythmic events in this cohort. Severe fixed myopathy was seen in a quarter of our cohort with 14% requiring a wheelchair or gait aid.

Conclusions This is the largest multi-system study in ATS and provides key clinical insights to improve diagnosis, as well as management recommendations to address the potential for severe muscle weakness and cardiac morbidity and mortality.