

GP.04

Prevalence and determinants of seizure action plans in a pediatric epilepsy population

M Chiu (Vancouver) S Peinhof (Vancouver) M Borhani (Vancouver) C DeGuzman (Vancouver) C Siu (Vancouver) B Kuzeljevic (Vancouver) D Schrader (Vancouver) L Huh (Vancouver) MB Connolly (Vancouver)*

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Background: Status epilepticus (SE) is the most common pediatric neurological emergency. Timely treatment is crucial, yet administration of rescue medications is often delayed and under-dosed. We aim to improve SE management by ensuring that every child at risk of SE in our province has an individualized seizure action plan (SAP) outlining the steps that should be taken during SE. **Methods:** A survey was distributed to parents of epilepsy patients aged 1 month to 19 years. Primary outcome was percentage of patients with SAPs. Secondary outcome was parental interest in a SAP mobile application. Following chart review, univariate and multivariate analysis was performed to identify variables that predict whether patients have SAPs. **Results:** Of 192 participants, 61.5% have SAPs. On univariate analysis, history of prior SE and male gender increased likelihood of having a SAP. On logistic regression, Nagelkerke R² was 0.204 and our model correctly predicted 82.2% of patients with SAPs. 83.3% of parents were interested in a SAP mobile application. **Conclusions:** This is one of the first studies to examine SAP prevalence in a pediatric epilepsy population. There is a need to increase the percentage of epilepsy patients with SAPs. Most parents would find a SAP mobile application valuable in their child's management.

GP.05

Intraoperative acquisition of diffusion tensor imaging in cranial neurosurgery: readout-segmented DTI versus standard single-shot DTI

CA Elliott (Edmonton) B Wheatley (Edmonton) H Danyluk (Edmonton) K Au (Edmonton) KE Aronyk (Edmonton) C Beaulieu (Edmonton) T Sankar (Edmonton)*

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Background: Diffusion-tensor imaging (DTI) tractography is commonly used in neurosurgical practice, but is largely limited to the preoperative setting. This is due primarily to image degradation caused by susceptibility artifact when conventional single-shot (SS) echo-planar imaging DTI is acquired for open cranial, surgical position intraoperative DTI (iDTI). A novel, artifact-resistant, readout-segmented (RS) DTI has not yet been evaluated in the intraoperative MRI (iMRI) environment. Our objective was to evaluate the performance of RS-DTI versus SS-DTI for intraoperative white matter imaging. **Methods:** Pre- and intraoperative 3T, T1-weighted and DTI (RS-iDTI and SS-iDTI) in 22 adults undergoing intraaxial iMRI resections (low-grade glioma: 14, 64%; high-grade glioma: 7, 32%; cortical dysplasia: 1). Regional susceptibility artifact, anatomical deviation relative to T1WI, and tractographic output were compared between iDTI sequences. **Results:** RS-iDTI resulted in less regional susceptibility artifact and mean anatomic deviation (RS-iDTI: 2.7±0.2 mm versus SS-iDTI 7.5±0.4 mm; p<0.0001). Tractographic failure occurred in 8/22 (36%) patients for SS-iDTI whereas RS-iDTI

permitted successful reconstruction in 4 of these 8. Maximal tractographic differences between DTI sequences were substantial (mean 9.7±5.7 mm). **Conclusions:** Readout-segmented EPI enables higher quality and more accurate DTI for surgically relevant tractography of major white matter tracts in intraoperative, open cranium, neurosurgical applications at 3T.

GP.06

Differential microglia and macrophage profiles in human IDH-mutant and -wildtype glioblastoma reveal therapeutic vulnerabilities

CC Poon (Calgary) P Gordon (Calgary) K Liu (Calgary) R Yang (Calgary) S Sarkar (Calgary) VW Yong (Calgary) J Kelly (Calgary)*

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Background: Microglia and macrophages (MMs) are the largest component of the inflammatory infiltrate in glioblastoma (GBM). However, whether there are immunophenotypic differences in isocitrate dehydrogenase (IDH)-mutated and -wildtype GBMs is unknown. Studies on specimens of untreated IDH-mutant GBMs are rare given they comprise 10% of all GBMs and often receive treatment at lower grades that can drastically alter MM phenotypes. **Methods:** We obtained large samples of untreated IDH-mutant and -wildtype GBMs. Using immunofluorescence techniques with single-cell automated segmentation, and comparison between single-cell RNA-sequencing (scRNA-seq) databases of human GBM, we discerned dissimilarities between GBM-associated MMs (GAMMs). **Results:** There are significantly fewer but more pro-inflammatory GAMMs in IDH-mutant GBMs, suggesting this contributes to the better prognosis of these tumors. Our pro-inflammatory score which combines the expression of inflammatory markers (CD68/HLA-A, -B, -C/TNF/CD163/IL10/TGFB2), Iba1 intensity, and GAMM surface area also indicates more pro-inflammatory GAMMs are associated with longer overall survival independent of IDH status. scRNA-seq analysis demonstrates microglia in IDH-mutants are mainly pro-inflammatory, while anti-inflammatory macrophages that upregulate genes such as FCER1G and TYROBP predominate in IDH-wildtype GBM. **Conclusions:** Taken together, these observations are the first head-to-head comparison of GAMMs in treatment-naïve IDH-mutant versus -wildtype GBMs that highlight biological disparities that can be exploited for therapeutic purposes.