NEURO-ONCOLOGY

P.083

Liquid biopsies reveal brain cell death in central nervous system tumors

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Background: Circulating cell-free DNA (cfDNA) is a novel type of biomarker with a broad utility in diagnostic medicine, based on the release of DNA fragments from dying cells to the circulation. We developed an approach for identifying the tissue origins of cfDNA, using cell-type-specific DNA methylation patterns, based on a massive reference atlas of the genome-wide methylomes of multiple human tissues and cell types. Cancer inflicts damage to surrounding normal tissues, which can culminate in fatal organ failure. We demonstrated that brain cell death in CNS cancer can be detected by tissue-specific methylation patterns of circulating cfDNA. Methods: We developed a cocktail of brain-specific DNA methylation markers, and used it to assess the presence of brain-derived-cfDNA in the plasma of patients with brain metastasis. Results: We identified significantly elevated neuron-, oligodendrocyte-, and astrocyte-derived cfDNA (p<0.0001) in patients with brain metastases (n=29) compared with cancer patients without brain metastasis (n=113). Conclusions: We show a new set of biomarkers to identify brain damage with high specificity and resolution. We detected brain (neurons, oligodendrocytes, astrocytes) cfDNA in the plasma of patients with brain metastasis. Cell-type-specific cfDNA methylation markers allow the identification of collateral tissue damage, reveals the presence of metastases, and potentially assist in early cancer detection.

NEUROMUSCULAR DISEASE AND EMG

P.084

The Canadian Neuromuscular Disease Registry: a national spinal muscular atrophy registry for real world evidence

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Background: Patient registries are an effective tool in tracking the natural history of rare diseases as well as post-marketing surveillance of novel therapies. The Canadian Neuromuscular Disease Registry (CNDR) is a pan-neuromuscular disease registry that prospectively collects Spinal Muscular Atrophy (SMA)-specific data in 28 clinics across Canada. The objective of this study is to describe real-world data from the CNDR-SMA patient population. Methods: We report cross-sectional data from Canadian SMA patients. Patients were included in analysis if they were active (alive and with follow-up within 24 months). Results: Of 171 SMA patients included in analyses, 37% currently use non-invasive ventilation, 2% invasive ventilation, and 61% no ventilation support. Feeding tubes are used by 27% of patients. and 28% of patients have a history of scoliosis surgery. Of the 171 patients, 137 have had disease-modifying therapy: 96 on nusinersen, 22 on risdiplam, and 19 on onasemnogene abeparvovec (OA). Median (min,max) years of age at therapy initiation was 7 (0,54), 20.5 (5,53), and 1 (0,6), respectively. At therapy initiation, functional status was 32% non-sitters, 38% sitters, and 30% walkers. Conclusions: The CNDR captures a comprehensive SMA dataset that prospectively evaluates real-world data, supporting post-marketing surveillance of novel therapies in Canada.

NEUROVASCULAR AND NEUROINTERVENTIONAL

P.085

The effect of remote ischemic conditioning on cognitive and radiological outcomes in cerebrovascular diseases: a systematic review

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Background: The effect of remote ischemic conditioning on cognitive and radiological outcomes in patients with cerebrovascular disease is uncertain. We performed a systematic review to evaluate the effects of remote ischemic conditioning on cognitive and radiological outcomes in patients with cerebrovascular diseases. Methods: A systematic search using relevant keywords and database specific terms was conducted in MEDLINE, Embase, and Web of Science from inception to October 27 2022. Results: A total of 4269 articles were screened, of which 20 were included. Ten papers assessing cognitive outcomes were included, with 5/10 reporting improvements in cognitive scores relative to a control group. Sixteen papers reporting on radiologic outcomes were included, three reporting on changes in infarct volume, and four on lesion volume. Improvement in infarct and lesion volume was reported in 1/3 studies and 4/4 studies respectively, however there was considerable variation in the time between assessments (range 1-365 days). Nine papers assessing blood flow changes were found, of which 3/8 using transcranial doppler reported improved blood flow velocity post intervention. Conclusions: The articles identified suggest that remote ischemic conditioning may provide improvement for both cognitive and radiological outcomes in patients with cerebrovascular diseases, however future well-designed studies are needed to determine degree of benefit.