Oral abstracts

001 NEUROLOGICAL MANIFESTATIONS OF CORONAVIRUS DISEASE 2019: A COMPREHENSIVE REVIEW

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Background There is growing evidence that SARS-Cov-2 infection is associated with severe neurological complications. Understanding the nature and prevalence of these neurologic manifestations is essential for identifying higher-risk patients and projecting demand for ongoing resource utilisation. This review and meta-analysis report the neurologic manifestations identified in hospitalised COVID-19 patients and provide a preliminary estimate of disease prevalence.

Methods MEDLINE, Embase and Scopus were searched for studies reporting the occurrence of neurological complications in hospitalised COVID-19 patients.

Results A total of 2207 unique entries were identified and screened, among which 14 cohort studies and 53 case reports were included, reporting on a total of 8,577 patients. Central nervous system manifestations included ischemic stroke (n=226), delirium (n=79), intracranial haemorrhage (ICH, n=57), meningoencephalitis (n=13), seizures (n=3), and acute demyelinating encephalitis (n=2). Peripheral nervous system manifestations included Guillain-Barré Syndrome (n=21) and other peripheral neuropathies (n=3). The pooled period prevalence of ischemic stroke from identified studies was 1.3% [95%CI: 0.9% – 1.8%, 102/7715] in all hospitalised COVID-19 patients, and 2.8% [95%CI: 1.0% - 4.6%, 9/318] among COVID-19 patients admitted to ICU. The pooled prevalence of ICH was estimated at 0.4% [95%CI: 0%-0.8%, 6/1006].

Conclusions The COVID-19 pandemic exerts a substantial neurologic burden which may have residual effects on patients and healthcare systems for years. Low quality evidence impedes the ability to accurately predict the magnitude of this burden. Robust studies with standardised screening and case definitions are required to improve understanding of this disease and optimise treatment of individuals at higher risk for neurologic sequelae.

002 SYNAPTIC ANTIBODIES AND SPINAL PREDOMINANT DEMYELINATION: A FORM OF MULTIPLE SCLEROSIS

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Objective To describe the clinical, radiological and pathological features of a novel demyelinating disease.

Methods 105 patients with multiple sclerosis (MS) were examined for phenotypic differences radiologically, and their sera were tested for novel autoantibodies using a solid phase, indirect, immunofluorescence method. The characteristics of patients that had a specific autoantibody in their sera, were compared to a cohort of 163 conventional MS patients (CMS).

Results Three of 105 (2.8%) MS patients had a serum autoantibody directed against vesicles of the Purkinje cell layer, synaptic molecules in the molecular layers of the cerebellum and hippocampus and the surface of choroid plexus epithelium. AQP4 and MOG antibodies were absent. Oligoclonal bands were absent in one patient. None of the other MS patients, 64 healthy controls or 78 other neurological controls exhibited this antibody.

Patients with synaptic antibodies had recurrent transverse myelitis, occasional optic neuritis and short, swollen cord lesions affecting the grey matter of the cord, in acute phase. Spinal cord demyelination was much more common in these patients (2.8 cord to 1 brain lesion) compared to CMS (1 cord to 5.8 brain lesions). Antibody positive patients suffered disease reactivation on Fingolimod (n=1) or responded poorly to Natalizumab (n=1). The disease was controlled with plasma exchange and Rituximab. The autoantibody bound to choroid plexus cells in culture from all three patients.

Discussion Synaptic antibodies and spinal predominant demyelination (SAPD) can be diagnosed with a new serological test and responds to treatment directed at humoral immunity.

003 AUTOIMMUNE ENCEPHALITIS ANTIBODY BIOMARKERS: FREQUENCY, AGE AND SEX ASSOCIATIONS

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Objective To determine the frequency, age and sex associations for autoimmune encephalitis antibody biomarkers (AE-Abs).

Methods There were 42032 patients tested in the Mayo Clinic Neuroimmunology Laboratory between January 2018-December 2019 for AE-Abs in serum and/or cerebrospinal fluid (CSF) including; NMDA-R-IgG, AMPA-R-IgG, GABAB-R-IgG, CASPR2-IgG, LGI1-IgG, GAD65-IgG, CRMP5-IgG, amphiphysin-IgG, PCA1/2/Tr-IgGs, ANNA1/2/3-IgGs, GFAP-α-IgG, mGluR1-IgG, DPPX-IgG, MOG-IgG1, were examined to determine frequency of antibody positivity. Age and sex associations were examined using multivariable logistic regression.

Results Adult serum analysis (22,472 patients; 56% female) revealed 814 (4%) were positive: NMDA-R-IgG (25%) > GAD65-IgG (22%) > LGI1-IgG (21%) > others. Of children (5,649; 50% female), 250 (4%) were positive: NMDA-R-IgG (53%) > MOG-IgG1 (32%) > GAD65-IgG (7%) > others.

Adult CSF analysis (18,745 patients; 54% female) revealed 709 (4%) were positive; NMDA-R-IgG (45%) > GAD65-IgG (19%) > LGI1-IgG (13%) > others. Of children (5136; 50% female), 276 (5%) were positive: NMDA-R-IgG (90%) > GAD65-IgG (7%) > others.

Age <20 years was associated with NMDA-R-IgG and MOG-IgG1 (OR=8.11 and 7.73 respectively, $p<0.001$). Age >65 years was associated with GABAB-R-IgG, LGI1-IgG, CASPR2-IgG and ANNA1-IgG (OR=7.33, 14.98, 3.67, 14.53, $p<0.001$). Women accounted for 60% of NMDA-R-IgG (CSF) and 78% of GAD65-IgG (CSF/serum) cohorts (OR=1.32, $p=0.002$, OR=2.78, $p<0.001$, respectively). Men accounted for 62% of the LGI1-IgG cohort (OR=1.87, $p<0.001$). Age and sex interacted for NMDA-R-IgG, particularly in females <20 years (OR=7.72, $p<0.001$).

Conclusion The most frequently detected were NMDA-R-IgG, LGI1-IgG, GAD65-IgG and MOG-IgG1. Age and sex associations may suggest paraneoplastic, endocrinological or aging influences on neurological autoimmunity.

004

PREGNANCY-RELATED RELAPSE IN NATALIZUMAB, FINGOLIMOD AND DIMETHYL FUMARATE-TREATED WOMEN WITH MULTIPLE SCLEROSIS

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Objective To investigate pregnancy-related disease activity in a contemporary multiple sclerosis (MS) cohort.

Methods Data were obtained from the MSBase Registry. Term/preterm pregnancies conceived from 2011-2019 were included (modern cohort). Annualised relapse rates (ARR) were calculated before, during and after pregnancy. Predictors of intrapartum and early postpartum (1st3 months) relapse were determined by clustered logistic and Cox regression analyses, respectively.

Results We included 1640 pregnancies from 1452 women. Disease-modifying therapy (DMT) used in the one-year pre-conception included natalizumab (n=219), fingolimod (n=147), dimethyl fumarate (DMF; n=57) and low-efficacy therapies (n=845). Preconception ARR by DMT class used before conception were: natalizumab, 0.29 (95% CI 0.22-0.37); fingolimod, 0.37 (0.28-0.49); DMF, 0.24 (0.13-0.41); low-efficacy, 0.29 (0.25-0.33); and none, 0.24 (0.19-0.31). Among women who used fingolimod or natalizumab, ARR increased during pregnancy. Intrapartum ARR decreased in preconception DMF, low-efficacy or no DMT groups. ARR spiked after delivery across all DMT groups. Natalizumab continuation into pregnancy reduced the odds of relapse during pregnancy (OR 0.76 per month [0.60-0.95], $p=0.017$). DMT re-initiation with natalizumab protected against postpartum relapse (HR 0.11 [0.04-0.32], $p<0.0001$). Breastfeeding women were less likely to relapse (HR 0.61 [0.41-0.91], $p=0.016$).

Conclusion Women with MS prescribed natalizumab or fingolimod preconception had higher rates of intrapartum and postpartum relapse. In women considered to be at high relapse risk, use of natalizumab before pregnancy and continued up to 32-34 weeks gestation, with early re-initiation after delivery is an effective option to minimise relapse risks. Strategies of DMT use have to be balanced against potential foetal/neonatal complications.

005

PSORIASIS IN MULTIPLE SCLEROSIS: AN AUSTRALIAN PREVALENCE STUDY

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Background Multiple Sclerosis (MS) is an immune-mediated, demyelinating disease of the central nervous system.¹ Although severe psoriasis and psoriasiform dermatitis have been noted in MS patients, the prevalence of psoriasis in these populations is uncertain and has not been explored in the Australian population.

Objectives A pilot study to estimate the prevalence of psoriasis in MS cohorts in the Australian population.

Methods A survey was conducted on 82 MS patients aged 18 and above who attended MS clinics in 2018.

Results Data was recorded for 82 patients. The mean age was 48 years for the entire cohort and 48.0 years (SD ±11.30)