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manifestations with neuronal loss in the frontal lobe, basal ganglia, hippocampus, cerebellum were present. In most of cases the arteriolosclerosis with perivascular rarefaction was present. The reactive astrogliosis with positive astrocytic marker GFAP was seen in all cases but showed variable degrees. The perivascular activation of microglia and the microglial nodules with CD68 positive cells were in the cortex, basal ganglia, hippocampus, brainstem, but less in cerebellum. And perivascular infiltration by CD3 was most pronounced in the brainstem.

#### Conclusions

Thus, the morphological changes of the CNS associated with COVID-19 include ischemic infarction with encephalolysis, astrogliosis, microgliosis, perivascular infiltration by CD3 in different regions of the brain.

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### 119838

#### Muscle manifestations and CK levels in COVID infection: Results of a large cohort of patients inside a pandemic COVID-19 area

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#### Background and aims Objective

to investigate both muscular manifestations and CK levels in a large cohort of patients with COVID-19 infection and to determine whether hyperckemia is associated with morbidity and mortality.

#### Methods

Data of 615 patients discharged from ASST Ovest Milanese (Milan, Lombardy, Italy) with final diagnosis of COVID-19 infection were retrospectively extracted from electronic medical records from 21 February to 1 May 2020. Patients were descriptively analyzed with respect to the following variables: sex, age, muscular manifestations (myalgia and/or arthralgia), fatigue, respiratory involvement (SARS pneumonia or respiratory failure) and history of falls. Association between patients' characteristics and CK levels was investigated. In addition, the proportion of patients who died following access to the ER was calculated. Finally, the effect of CK levels and other patients' features on mortality was estimated using a logistic regression model.

#### Results

176 (28.6%) patients had raised serum CK levels. CK levels were significantly associated with history of falls, male gender, SARS pneumonia, respiratory failure and in-hospital death. No correlation was found between hyperckemia and muscular manifestations.

#### Conclusions

Our study provides preliminary evidence that hyperckemia is associated with respiratory failure and fatal outcome in patients with COVID-19 infection. In these patients, among other testing, CK dosage is recommended.

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### 119839

#### Asymptomatic peripheral neuropathy in patients with SARS-CoV-2 infection

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#### Background and aims

Several neurological complications related to SARS-CoV-2 infection have been reported. The involvement of peripheral nervous system (PNS) consists in the development of immune-mediated neuropathies such as Guillain-Barrè Syndrome. In this study we aim at assessing the presence of asymptomatic abnormalities in peripheral nerves conduction during the acute phase of COVID-19 and, their correlation with blood circulating inflammatory markers.

#### Methods

Thirty-nine patients with COVID-19 were assessed by electroneurographic study of lower limbs and blood tests within one week of hospital admission (T0) and after 30 ± 10 days (T1).

#### Results

Electroneurographic changes were found at least on one nerve at T0 in 12 patients, consisting of axonal or demyelinating changes. Two biological markers were found to be significantly correlated with the presence of neuropathic changes: Reactive Protein C and lymphocyte count. Patients with pathological electrophysiology at T0 showed significant improvement of electrophysiological parameters at T1. The improvements in electroneurographic data were significantly correlated with the trend of laboratory parameters, in particular with fibrinogen, D-Dimer, ferritin, C Reactive protein and lymphocytes. None of the patients with neuropathic changes developed clinical evidence of a full-blown peripheral neuropathy over time.

#### Conclusions

Our study shows that asymptomatic alterations of the PNS can be found during the acute phase of COVID-19. These alterations significantly improve after 20–40 days from the acute phase of infection and that the improvement correlates significantly with the trend of laboratory parameters. Further studies are needed to evaluate possible long-term neurological complications and the predictive value of subclinical damage of PNS in the acute phase of infection.

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### 119840

#### Neurocovid: Can CSF immune reactivity give new insight on neurological manifestations in COVID-19 patients?

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#### Background and aims

Neurological manifestations have been increasingly associated with COVID-19, but there is little evidence of a direct viral

pathogenesis. Clinical heterogeneity and confounding factors also impair the search for alternative mechanisms. Therefore, we studied the CSF of 13 patients with neurological symptoms during the acute phase of their hospitalization, looking for clues suggesting a specific dysimmune phenomenon.

#### Methods

CSF underwent conventional analysis and RT-PCR for SARS-CoV-2; a in-house HEK293 cell-based assay was also arranged to identify anti-spike antibodies. Albumin ratio, IgG index and oligoclonal bands were also assessed, along with a screening for autoimmune antibodies. First, commercial immunofluorescence and lineblot were used to detect common neuronal surface and intracellular antibodies, respectively; secondly, immunohistochemistry was performed on rat brain sections; lastly, CSF was incubated with fixed murine neuron and astrocyte cultures to confirm a potential auto-reactivity.

#### Results

CSF analysis disclosed a slightly increased protein level with a non-significant cell count (0–10 cells/uL). Neither SARS-CoV-2 nor common neuronal antibodies were detectable in the CSF, but we recognized anti-spike IgGs. 69% of the samples also showed neuropil staining, some of which had a common staining pattern involving the hippocampal dentate gyrus. Rodent primary cultures confirmed the presence of autoreactive antibodies against epitopes that are expressed in cortical neurons and/or astrocytes in most samples.

#### Conclusions

A strong immunoreactivity against spike protein was found in the CSF of those patients, even without a significant blood brain barrier permeability. The detection of auto reactivity with two different techniques could thus represent a dysimmune response to COVID-19 infection, perhaps suggesting molecular mimicry.

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## 119841

### Paediatric transverse myelitis during COVID-19 asymptomatic infection: A case report

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#### Background and aims

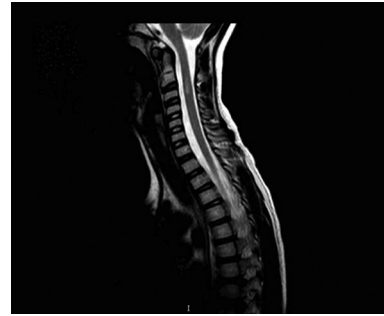
Paediatric Transverse myelitis (TM) is a rare, demyelinating immune-mediated disorder of the Central Nervous System. Its immunopathogenesis is not completely understood. Viral infections are recognized triggers that precede TM in 66% of cases. Although uncommon, neurological involvement with spinal cord damage can occur following SARS-CoV-2 infection. Although the co-occurrence of TM and SARS-CoV-2 is more frequently observed in adults, children may also be affected.

#### Methods

We report a pediatric case of TM during SARS-CoV-2 asymptomatic infection.

#### Results

A 12-year-old boy complained of severe nuchal pain that lasted for a few hours and was followed by hyposthenia on the right hemisoma persisting for approximately 12 h. Brain MRI scan was normal. Spinal cord MRI demonstrated a T2/FLAIR hyperintense



lesion, enhancing post-contrast, at C2 level. CSF and blood microbiology and virology were negative. CSF SARS-CoV-2 genoma sequencing and oligoclonal bands were negative. Serology for AQP4 and anti-MOG antibodies was negative. Acyclovir, azithromycin and high dose intravenous methylprednisone were also administered for 8 days. The patient completely recovered and was discharged after 11 days with steroid tapering. He had a follow-up spinal cord MRI a month later that returned normal.

#### Conclusions

Neurological complications during SARS-CoV-2 infection are rare in children, but may occur as a consequence of dysimmunity possibly triggered by SARS-CoV-2.

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## 119842

### The first year of neurology and COVID-19: The importance of understanding neurological and biopsychosocial symptoms in acute and post neurocovid disease

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#### Background and aims

After the first year since its first reporting Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), causing Coronavirus disease 2019 (COVID-19), has infected nearly 120 million people and resulted in almost more than 2 million deaths globally. After one year from the first report of neurological symptoms in a Chinese patient, more than 55 countries to date have reported symptoms including impaired taste or smell, headache, dizziness, delirium, agitation, stroke, hypoxic ischaemic brain injury, seizures, coma, meningo-encephalitis, Guillain-Barré syndrome, myalgia, amongst others. Consequences seen in the follow-up periods of COVID-19 infection are also becoming more and more apparent mostly with reports of persistent problems with smell or taste, cognitive impairment, headaches, confusion, difficulty concentrating and sleep disturbance.

#### Methods

Recently more and more studies on long term consequences of acute COVID are being published, such as the Study NEXT, a