Category :**Brain: Neurologic disease**

A217 - ***Long-term cognition and neuroinflammation in patients with coronavirus disease (COVID-19)***

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Introduction:

Cognitive complaints occur in a high percentage of patients suffering from long-COVID and can have lasting negative impact on rehabilitation, daily functioning and quality of life. COVID-19-induced neuroinflammation may account for this: innate immune cells of the brain become activated, due to systemic inflammation and a compromised blood-brain barrier, causing a neuroinflammatory state of the brain resulting in neuronal damage.

Methods:

This prospective single centre observational study serially assessed plasma inflammation and brain damage markers during hospital admission in both ICU and ward patients. Samples were collected every 5-7 days during hospital stay and analysed using Simoa Neurology 4-plex for neuronal/neuroinflammatory biomarkers and Luminex Milliplex assay for cytokine determination. After six to eight months, included patients were asked to join additional cognitive examination, consisting of the Trail Making Test A and B, Letter Digit Substitution Test, Montreal Cognitive Assessment. Cognitive test results were compared to available normative data, adjusted for age and level of education.

Results:

We included 123 patients with COVID-19 for plasma sampling and performed follow-up cognitive testing in 48 patients. Clinically significant cognitive impairment was measured in 38% to 50% of patients in at least one cognitive domain, depending on the applied cut-off value, with executive function most often affected. Momentarily, the plasma samples are being analysed and we expect our results within the next few weeks.

Conclusion:

This study is the first to correlate serial plasma inflammatory and neurological damage markers to long-term cognition in COVID-19 patients. The findings will demonstrate whether or not the plasma inflammatory and neurological damage markers exert accuracy to predict post-COVID cognitive dysfunction, thereby possibly facilitating development of future (therapeutic or preventative) interventions.