CSF signature of cytotoxic T cells and MS-like lesions in a patient after COVID-19

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Case presentation: Here we describe a patient who manifested CNS-demyelinating lesions resembling Multiple Sclerosis (MS) pattern after symptomatic infection due to coronavirus disease 2019 (COVID-19). Moreover, using high-dimensional flow cytometry analyses, we identified strong cytotoxic signature (*CD27-, CD28-, CD49d+, CD56+, CD57+, CD94+, CD195+, CD215+, T-bet+*) from both CD8+ and CD4+ T cells, in the cerebrospinal fluid and peripheral blood, after patient's recovery for COVID-19. **Discussion:** Despite their positive role during antiviral and antitumor immune responses, persistent cytotoxic T cells are known to cause tissue damage in diverse conditions. Particularly, in MS patients, these subsets can be found in the CNS-parenchyma during severe relapses, as well as in inflamed meninges during progressive disease course. We hypothesize that enhanced cytotoxic immune responses helped to eliminate SARS-CoV-2 infection, however, the sustained aggressive cytotoxic behavior, in this case, leaded to the vascular/CNS damage shortly after COVID-19 recovery. **Final comments:** Investigating CNS-implications, as well as characterizing persistent antiviral cellular immune responses against SARS-CoV-2, may be powerful tools for further comprehension about early diagnosis of neurovascular/neurodegenerative events related to COVID-19.