

## Multiple drugs

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**Various toxicities, lack of efficacy, off-label use and drug interactions: 4 case reports**

In an observational, prospective, monocentric study of patients diagnosed with neurological complications of COVID-19 and admitted at hospital in Spain between 7 March 2020 and 7 June 2020, four patients including 2 men and a 61-year-old woman [*not all sexes and ages stated*] were described, who developed Moyamoya syndrome during treatment with tacrolimus (n=1), serotonin syndrome during concomitant administration of duloxetine, lithium, morphine or risperidone with off-label lopinavir/ritonavir for COVID-19 (n=2), and lack efficacy with immune-globulin while being treated for transverse dorsal myelopathy (n=1) [*not all routes, indications and outcomes stated; dosages and time to reactions onset not stated*].

A 61-year-old woman was admitted to a hospital in Spain due to COVID-19. She developed left middle cerebral artery stroke 14 days following the onset of COVID-19. A CT angiogram and brain MRI showed multiple vascular stenoses and a collateral pattern, which were consistent with a Moyamoya angiopathy. Anamnesis revealed that she had been receiving tacrolimus for 4 years following liver transplant. Multiple investigations ruled out the most common aetiologies for Moyamoya syndrome, and it was noted that Moyamoya syndrome was potentially related to tacrolimus. COVID-19 infection was considered to have triggered endotheliitis.

Two men were hospitalised in Spain due to COVID-19 and started receiving off-label lopinavir/ritonavir for COVID-19. One of them had been receiving lithium and duloxetine, while the other man had been receiving risperidone and morphine. They developed impaired consciousness, hyperthermia, hyperreflexia and myoclonus. Both of them were diagnosed with serotonin syndrome which led to encephalopathy. Therefore, serotonergic drugs were discontinued resulting in progressive improvement of the neurological symptoms. It was noted that serotonin syndrome was triggered by lopinavir/ritonavir after its used in combination with serotonergic drugs.

Another patient was hospitalised in Spain due to COVID-19 and developed transverse dorsal myelopathy manifested as lower limb weakness, sensory impairment, hyperreflexia, and sphincter dysfunction 15 days after the onset of COVID-19 symptoms. The patient had a history of leukaemia, which was treated with methotrexate and a bone marrow transplant. On admission, the patient started receiving IV immune-globulin [immunoglobulins], without any clinical improvement of the neurological symptoms. Lack of efficacy of immune-globulin was considered. The patient died respiratory distress 3 weeks after developing neurological symptoms.

Portela-Sanchez S, et al. Neurological complications of COVID-19 in hospitalized patients: The registry of a neurology department in the first wave of the pandemic. *European Journal of Neurology* 28: 3339-3347, No. 10, Oct 2021. Available from: URL: <http://doi.org/10.1111/ene.14748>

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