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Baricitinib: A chance to treat COVID-19?

To the Editor,

Currently, there are no approved therapies for the treatment of COVID-19. With most of the world on lockdown and the looming threat of millions of deaths, there is immense pressure to find a therapy for this disease.

Recently, baricitinib has been proposed as a potential treatment for COVID-19 due to its anti-inflammatory and antiviral activities.[1]

In fact, Baricitinib a potent and selective Janus Kinases (JAK) inhibitor currently used in the therapy of rheumatoid arthritis (RA), would likely prevent the dysregulated production of proinflammatory cytokines typically observed in people with Covid-19.[2] Moreover, baricitinib, by binding to AP2-associated protein kinase 1 (AAK1), a pivotal regulator of clathrin-dependent endocytosis, might also inhibit virus entry into target cells.[3] Finally, the oral administration and the minimal interactions with CYP enzymes, make baricitinib one of the most promising drug among those currently available.[4]

Herein we report for the first time the favorable clinical course of a patient with a diagnosis of RA who had undergone baricitinib therapy for more than a year and who developed COVID-19.

The patient, an 87-year-old woman, was admitted on March 10, to the Infectious Disease Unit, University Hospital of Foggia, Italy with a mild-to-moderate COVID-19. The patient was part of a familiar cluster, as COVID-19 was diagnosed in three other family members (husband, son, and daughter) (Table 1). At admission, chest radiography showed the presence of bi-basal infiltrates. Baseline laboratory tests showed lymphopenia, increased C-reactive protein and serum IL-6 concentrations that were increased but still significantly lower compared to those observed in her husband and her son, who also showed increased levels of IL-8, interferon gamma, and monocyte chemoattractant protein-1 (Table 2).

The patient received supplemental oxygenation, lopinavir/ritonavir, hydroxychloroquine, while continuing baricitinib. Therapy was successful as she recovered: she is currently apyretic with O_2 saturation 95% in ambient air.

In contrast, her husband (90-year-old) and son (59-year-old), who received the same therapy with the exception of baricitinib, showed a rapid disease progression and after few days they died of respiratory failure.

Although no conclusion can be drawn from a single case, the favorable course of COVID-19 observed in this patient despite the older age, and the underlying rheumatologic disease, allows to speculate that baricitinib had a positive impact on the outcome. Data herein, although preliminary, support the suggestion to clinically evaluate the use of baricitinib in patients with COVID-19.

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The patient has given written consent to the processing of their data

TABLE 1 Demographic, clinical, and baseline biochemical characteristics

	Patient	Husband	Son	Daughter
Age, years	87	90	59	57
Comorbidity	AR	Hypertension, chronic kidney disease, cardiovascular disease	Hypertension	None
COVID-19 stage	Moderate	Severe	Moderate	Mild
Pneumonia	Yes	Yes	Yes	Yes
Antiviral therapy	LPV/r HCQ	LPV/r HCQ	LPV/r HCQ	LPV/r HCQ
Blood routine (normal range)				
Leucocytes 10^3U/L (4.0-10.0)	6.14	1.74	4.1	3.85
Lymphocytes 10^3U/L (0.8-4.5)	0.84	0.19	0.9	1.11
Platelets 10^3U/L (130-450)	180	73	130	117
CRP, mg/L(0-5)	119	217	88	54
D-dimer, ng/mL (0-500)	1800	17671	1480	517
PaO_2/FiO_2	250	187	220	275

Abbreviations: AR, rheumatoid arthritis; CRP, C-reactive protein; HCQ, hydroxychloroquine; LPV/r, lopinavir/ritonavir.

TABLE 2 Baseline cytokine/chemokine profile

IL 2	IL 4	IL 6	IL 8	IL 10	VEGF	IFN γ	TNF α	IL 1 α	IL 1 β	MCP 1	EGF
Normal range											
4.8-8.7	0-6.6	1.2-1.9	7.9-14.4	0.1-1.8	14-372	0-3.54	0.1-5	0.8-1.45	0-1.6	69-500	3-271
Patient											
0	**3.84**	**10.84**	**18.73**	**0.62**	**23.93**	**0**	**0**	**0**	**0**	**208**	**37**
Husband											
0	**2.62**	**357**	**103**	**21**	**0**	**253**	**2.2**	**0.23**	**0.98**	**1019**	**11.74**
Son											
0	**1.74**	**50.46**	**16.97**	**2.95**	**213.31**	**16.33**	**1.94**	**0.23**	**1.24**	**771**	**4.32**
Daughter											
0	**3.17**	**7.69**	**31.59**	**5.35**	**22.85**	**1.30**	**0.10**	**0.10**	**0.10**	**354**	**40.34**

Note: Bold values are above the upper normal limit.
Abbreviations: EGF, epidermal growth factor; IFN, interferon; IL interleukin; MCP, monocyte chemoattractant protein; TNF, tumor necrosis factor; VEGF, vascular endothelial growth factor.

CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

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