

**Online supplementary Table S1. Criteria for patients' selection**

<b>MAS</b>	<b>Severe COVID-19</b>
Diagnosis of MAS according to Fardet L et al Criteria*	Diagnosis of SARS-CoV-2 infection confirmed by RT-PCR
Exclusion of pulmonary infection by a specific workup**	Admission of Intensive or Sub-intensive care unit
Exclusion of infective trigger**	Exclusion of co-infection**
Lung involvement documented by chest CT scan	Lung involvement documented by chest CT scan
Enough quality of CT images to be reconstructed by AI-software	Enough quality of CT images to be reconstructed by AI-software
Data collected before starting any immunomodulatory therapy for MAS	Data collected before starting any immunomodulatory therapy for severe COVID-19

\*Fardet L, Galicier L, Lambotte O, et al. Development and validation of the HScore, a score for the diagnosis of reactive hemophagocytic syndrome. *Arthritis Rheumatol*. 2014;66:2613-2620.

\*\*Exclusion of infections by blood cultures, bone marrow cultures (in MAS patients), serology, RT-PCR analyses, chest X-rays, chest CT scan, heart and abdominal echography, according to the proposed diagnostic workup for fever of unknown origin. Tuberculosis was excluded by quantiFERON-TB Gold In-Tube and RT-PCR analyses of sputum and urine of patients. Brucellosis, Q fever, EBV, CMV, HIV, typhoid/enteric fevers, and toxoplasmosis were tested by specific sera antibodies. Visceral leishmaniasis was excluded by sera antibodies and RT-PCR analysis of bone marrow samples (MAS patients). Periapical dental, intra-abdominal, pelvic, and intra/perinephric abscesses were also excluded. According to the clinical history, subacute bacterial endocarditis, chronic sinusitis/mastoiditis, subacute vertebral osteomyelitis, aortoenteric fistula, and vascular graft infections were also excluded. Furthermore, as suggested by the proposed diagnostic workup for fever of unknown origin [Cunha BA. Fever of unknown origin. In: Gorbach SL, Bartlett JG, Blacklow NE, eds. *Infectious Diseases in Medicine and Surgery*. 3rd ed. Philadelphia: Lippincott Williams & Wilkins; 2004: 1568-1577; Cunha CB, Cunha BA. Fever of unknown origin (FUO). In: Schlossberg D, ed. *Clinical Infectious Disease*. 2nd ed. Cambridge, UK: Cambridge University Press; 2015:1-6], the following alternative diagnoses were also excluded in case of suggestive clinical history: *Borrelia recurrentis*, *Streptobacillus moniliformis* or *Spirillum minus*, leptospirosis, histoplasmosis, coccidiomycosis, lymphogranuloma venereum, Whipple's disease, malaria, babesiosis, ehrlichiosis/anaplasmosis, chronic prostatitis, recurrent cholangitis.