by carbapenemase-producing *Enterobacteriaceae* or multiresistant *Acinetobacter baumanii*. Except for ESBL *Klebsiella pneumoniae*, which is more frequent on admission in patients with SCI, we have not found other patient characteristics related to a certain MDRO detected on admission or as an aetiology of infection.

As for factors related to the presence of MDROs, we agree with other studies that low functional level is a risk factor for presenting MDROs at admission, unlike the length of time with the injury or other factors described in the literature (age, sex).[4–6] MDRO infections are more frequent in patients with SCI, due to a higher incidence of urological infections,[8] and patients with MDROs at admission (61% with MDROs vs. 39% without MDROs at admission; $p < 0.001$ chi-square test). Although 6.6% of patients had MDRO infections during hospitalisation, it is noteworthy that in 39% of them MDROs were not detected on admission, which reveals the transmission and/or acquisition of new MDROs during the hospital stay, a circumstance already described in our centre for ESBL *Enterobacteriaceae*.[9]

In patients with MDRO infection, the length of hospital stay in the IG was significantly longer, in the same way as has been described in nosocomial infections in general.[10]

In conclusion, the notable presence of patients with MDROs on admission, especially in those most dependent, and its possible consequences (transmission, infection, hospital stay), make control measures in neurorehabilitation centres essential, especially screening on admission.

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Multisystem inflammatory syndrome in adults associated to SARS-CoV-2☆,☆☆

Síndrome inflamatorio multisistémico del adulto asociado a SARS-CoV-2

Paediatric multisystem inflammatory syndrome is a condition described in 2020 as a result of the COVID-19 pandemic and whose pathogenesis is not completely clear.[1] Cases have also been described in adults, in whom it is much more infrequent; the largest series published to date is of 51 cases.[2]

We describe a case of multisystem inflammatory syndrome in adults (MIS-A) and its histopathology.

The patient was a 31-year-old woman, with a history of lymphocytic meningitis of probable viral origin in 2010 and pyelonephritis in 2018. She was diagnosed in January 2021 with mild COVID-19 (positive antigen test), progressed favourably and was discharged two weeks later. Four weeks later she began with fever, headache, vomiting, mild diarrhoea and very intense pain in the right iliac fossa (RIF) for which she went to the emergency department. She was admitted on the fourth day after the onset of symptoms. At that time, she was febrile (38.5 °C), with blood pressure of 95/70 mmHg, heart rate of 96 bpm and baseline oxygen saturation of 98%. Of note were her mucocutaneous pallor, RIF pain on palpation and mild neck stiffness. Laboratory tests revealed thrombocytopenia, anaemia, lymphopenia, and elevated ESR, D-dimer, ferritin and C-reactive protein (Appendix B). An ECG showed sinus tachycardia. An urgent abdominal CT revealed mesenteric adenopathy. A SARS-CoV-2 PCR test (GeneXpert®, Cepheid) of nasopharyngeal swab was positive with a cycle threshold (Ct) >30. Lumbar puncture was normal. Blood cultures, stool cultures and urine cultures were negative. Serologies, performed with chemilumi-

☆ This case was awarded first prize in the COVID SEIMC-Gilead clinical case contest at the XXIV Congress of the Sociedad Española de Enfermedades Infecciosas y Microbiología Clínica, held online from 5 to 11 June 2021.

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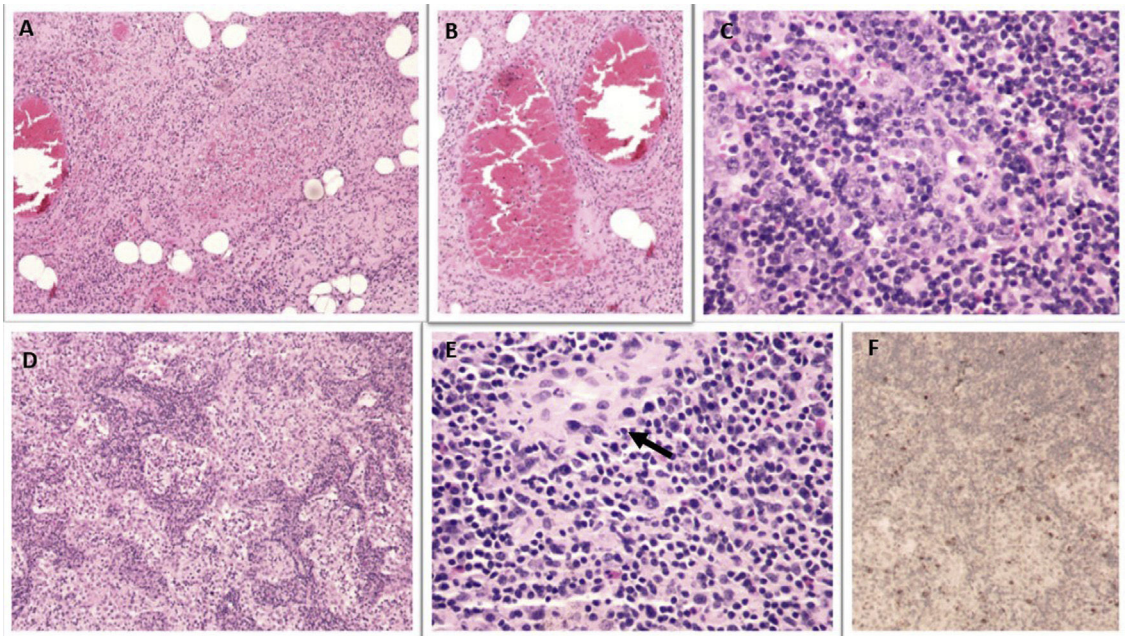

Fig. 1. Lymph nodes with necrotising lymphadenitis: ischaemic necrosis with necrotising vasculitis (**A**), periganglionic vessels with red thrombus (**B**), follicular hyperplasia with immunoblastic reaction (**C**), plasmacytosis and sinus histiocytosis (**D**). Presence of occasional microgranulomas (**E**) *(arrow)*. Positive immunohistochemistry for SARS-CoV-2 (**F**).

nescence immunoassay, were negative for HIV (IgM + IgG + agp24), syphilis (IgG + IgM), *Toxoplasma*, mumps, rubella, *Coxiella*, *Rickettsia*, *Bartonella* and *Legionella* (IgG and IgM), hepatitis C (IgG) and hepatitis B (negative HBsAg, anti-HBs and anti-HBc), while positive IgG was detected with negative IgM for CMV, EBV, parvovirus and VZV and positive IgG for SARS-CoV-2. A PCR test for *Leishmania* (Werfen) was negative. The autoimmunity study was normal. The patient's condition deteriorated on the ward, with worsening clinical signs and test results (Appendix B), so treatment with piperacillin-tazobactam and doxycycline was started. On the fourth day after admission, she presented shock (BP: 70/40 mmHg; HR: 136 bpm) and severe oliguria, which did not respond to fluid therapy, so a new thoraco-abdominopelvic CT (Appendix B) was performed, which showed generalised adenopathy, especially in the root of the mesentery and RIF, mild splenomegaly, fluid in the pericardial recess, periportal oedema and mild to moderate ascites. She was admitted to the ICU and treated with piperacillin-tazobactam, linezolid, ganciclovir and liposomal amphotericin B, pending microbiological results. Suspecting septic shock of abdominal/gynaecological origin, an exploratory laparotomy was performed, which resulted in no pathological findings, except for mesenteric and mesocolic lymphadenitis. The affected lymph nodes were resected.

The biopsy revealed necrotising lymphadenitis and reactive lymphoid hyperplasia with extensive sinusoidal histiocytosis, with no haemophagocytosis phenomena observed (Fig. 1). A PCR test for SARS-CoV-2 in the lymph node (GeneXpert®, Cepheid) was positive. The patient was started on dexamethasone (20 mg/day), with clinical improvement; the norepinephrine was withdrawn and she was sent back to the ward. There, her vomiting and cytopenia persisted and she required the transfusion of two units of packed red blood cells due to anaemia. A bone marrow biopsy (Appendix B) showed moderate hypocellularity, with a mosaic pattern. An echocardiogram showed mild pericardial effusion and normal systolic and coronary function. Lastly, MIS-A was diagnosed, since it met the criteria for a definitive case.[3] Intravenous immunoglobulin (IVIG) (2 g/kg) was added, with improved clinical signs and test results being observed. The patient was discharged with decreasing corticosteroids, acetylsalicylic acid (100 mg/day) and prophylactic enoxaparin. Six weeks later, she was asymptomatic and an echocardiogram was normal, so the acetylsalicylic acid was withdrawn.

The patient was initially managed as a case of haemophagocytic lymphohistiocytosis.[4] However, she met criteria for a definitive case (level 1) of MIS-A, according to the *Brighton Collaboration* case definitions of 2021,[3] and her response was very good to treatment with IVIG and corticosteroids. The pathogenesis of MIS-A is unknown. It could be due to an aberrant interferon response that leads to a hyperinflammatory state, with endothelial dysfunction and microangiopathy.[1] Most of the cases described are in young adults from ethnic minorities[5,6] two to five weeks after SARS-CoV-2 infection, with predominantly cardiac and gastrointestinal involvement and a mortality rate of 3.9–11.1%.[2,5,6] Cases associated with vaccination against SARS-CoV-2 have also been described.[7] Treatment is extrapolated from paediatric recommendations[8]; the use of IVIG and corticosteroids[9] is recommended, although a recent article has found no benefit from the combination in children.[10]

In conclusion, MIS-A should be suspected in all adults with a history of COVID-19 in the last 12 weeks who present with fever, inflammatory markers, cardiovascular involvement and extrapulmonary organ involvement, and early treatment with IVIG or corticosteroids should be established.

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Conflicts of interest

The authors declare that they have no conflicts of interest.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.eimc.2021.10.009.

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Rapid diagnosis of pulmonary tuberculosis using Xpert MTB/RIF assay in gastric aspirate samples from adult patients with sputum-absent disease: A first-step alternative to bronchoscopy?

Diagnóstico precoz de la tuberculosis pulmonar mediante Xpert MTB/RIF en muestras obtenidas mediante aspirado gástrico en pacientes adultos que no expectoran: ¿una alternativa previa a la broncoscopia?

Sputum-absent pulmonary tuberculosis (PTB) is common in adult patients. It leads to misdiagnoses and delays of PTB and forces to rely on alternative diagnostic approaches such as bronchoscopy (BC). XpertMTB/RIF on gastric aspirate (GA) sampling is an option in this scenario,[1] mainly in the pediatric population,[2] but evidence of its usefulness on the adult population is scarce and no previous work has studied its diagnostic performance compared with a reference standard such as tuberculosis culture (TC) from BC samples. TC from GA samples has been previously compared with TC from BC samples showing a positive culture yield of 21% *vs.* 34% respectively.[3]

In the present study we compared the diagnostic yield of the Xpert MTB/RIF assay in GA samples with regard to TC obtained through BC in adult patients with suspected PTB and no sputum production. The secondary aim was to compare the diagnostic performance of the Xpert MTB/RIF assay *versus* that of the TC in the same GA sample. Overall, confirmed PTB diagnosis was made if either Xpert MTB/RIF assay or TC were positive.

We retrospectively reviewed all the GA samples obtained between January 2015 and May 2018 from adult patients with clinical or radiological suspicion of PTB, no sputum production and which fulfilled the inclusion criteria: (a) GA samples were processed for TC and Xpert MTB/RIF; (b) when the GA Xpert MTB/RIF assay was negative a TC was obtained through BC. GA samples were obtained through nasogastric tube in the morning after overnight fasting, and then processed and decontaminated within less than 2 h from sampling.[4] Since no bronchoscopic sampling was performed in patients with a positive Xpert MTB/RIF assay in GA, it was assumed that all GA-positive patients would have been diagnosed with TC obtained through BC.

Forty-three GA samples from 43 patients were reviewed and 31 were finally included in the analysis. The Xpert MTB/RIF was positive in 9 patients (29.0% [9/31]). Eight of them had a positive TC in the same GA sample, whereas the GA culture of the remaining patient was contaminated. Among the 22 patients with negative Xpert MTB/RIF assay in GA (70.9% [22/31]), two (9.1% [2/22]) had a positive TC only in the BC sample and one additional patient (4.5% [1/22]) had a positive TC only in the GA sample. Overall, the diagnosis of PTB was confirmed on the basis of TC performed in GA and/or BC samples in 12 patients (38.7% [12/31] of the overall study cohort).

The sensitivity and specificity of the Xpert MTB/RIF assay in GA samples by using TC in BC samples as reference method were 81.9% (95% CI: 48.2–97.7) and 100.0% (95% CI: 83.2–100), respectively. The NPV was estimated at 90.9% (95% CI: 74.1–97.2) (Table 1). On the other hand, the Xpert MTB/RIF assay exhibited a sensitivity of 88.9% (95% CI: 51.8–99.7) and a specificity of 95.5%