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Anterior uveitis in paediatric inflammatory multisystem syndrome temporally associated with SARS-CoV-2

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A 12-year-old boy was referred to our hospital with a 6-day history of a fever—maximum 40°C—of unknown origin and malaise. He had no previous medical problems, no prior upper respiratory tract symptoms, or known exposure to a SARS-CoV-2-positive individual.

On examination, the patient had a strawberry tongue, macular exanthem of the skin, conjunctival hyperaemia, and abdominal pain. He had not vomited and had no diarrhoea.

Blood tests showed a high C-reactive protein (289 mg/L), elevated liver enzymes—aspartate aminotransferase was 186 U/L, and alanine aminotransferase was 123 U/L—elevated troponin (78 ng/L), elevated N-terminal-pro-B-type natriuretic peptide (6302 pg/mL), elevated ferritin (1991 µg/L), low albumin (19.9 g/L), and a coagulopathy—prothrombin time 18.1, activated partial thromboplastin time 42, fibrinogen 6.1 g/L, and D-dimer 41 mg/L. IL-6 and procalcitonin were not evaluated. At the time of referral, the SARS-CoV-2 RT-PCR on nasopharyngeal and throat swab tests was negative.

The patient was transferred to intensive care because of tachypnoea, shock, and reduced responses; we suspected paediatric inflammatory multisystem syndrome temporally associated with SARS-CoV-2 (PIMS-TS) or Kawasaki disease. We treated him with volume expansion, vasoactive agents, immunoglobulin, ceftriaxone and methylprednisolone for 3 days, followed by prednisone in a tapering down schedule.

On day 7 of the admission, the patient reported bilateral blurred vision without photophobia; his best corrected visual acuity was 20/20 on both eyes with normal eye pressure of 14 mm Hg on both sides. Mild anterior chamber reaction (1+ cells) without flare, conjunctival hyperaemia without discharge (figure), and no signs of vitreous inflammation were seen in both eyes on slit lamp examination. We diagnosed anterior uveitis (AU) and successfully treated him with prednisolone acetate 10 mg/mL eye drops once a day for 10 days. SARS-CoV-2 antibodies were found in the patient's blood, definitively diagnosing PIMS-TS. We believe this to be the first paediatric patient with bilateral AU secondary to a SARS-CoV-2 infection.

COVID-19 in children and adolescents generally only causes mild symptoms. However, an immune response with persistent fever, inflammation, and single or multiorgan dysfunction, without any microbial cause, but with a high suspicion or PCR evidence of SARS-CoV-2 is increasingly seen in young, previously

asymptomatic patients, and can resemble Kawasaki disease.

COVID-19 and PIMS-TS can present with ocular symptoms. Ocular symptoms associated with COVID-19 in adults are visual impairment, epiphora, conjunctival hyperaemia, chemosis, conjunctivitis, subepithelial corneal infiltrates, AU, and abducens nerve palsy. In PIMS-TS, only conjunctivitis has been reported. The time course of the presenting symptoms in our patient strongly suggests an association between SARS-CoV-2 infection and AU—although other possible causes of uveitis cannot completely be excluded due to the absence of additional screening tests.

Recognition and treatment of AU is important due to the possible ocular complications—including posterior synechiae, band keratopathy, a rise in intraocular pressure leading to glaucoma, cataract, and cystoid macular oedema—potentially leading to permanent visual impairment (video).

Contributors

We all provided care for the patient. JEREWC drafted the manuscript. ÖE wrote the case description. JHB, TFWW, and TJCR provided supervision, discussion, and additional input. Written consent for publication was obtained from the patient's mother.

Declaration of interests

We declare no competing interests.

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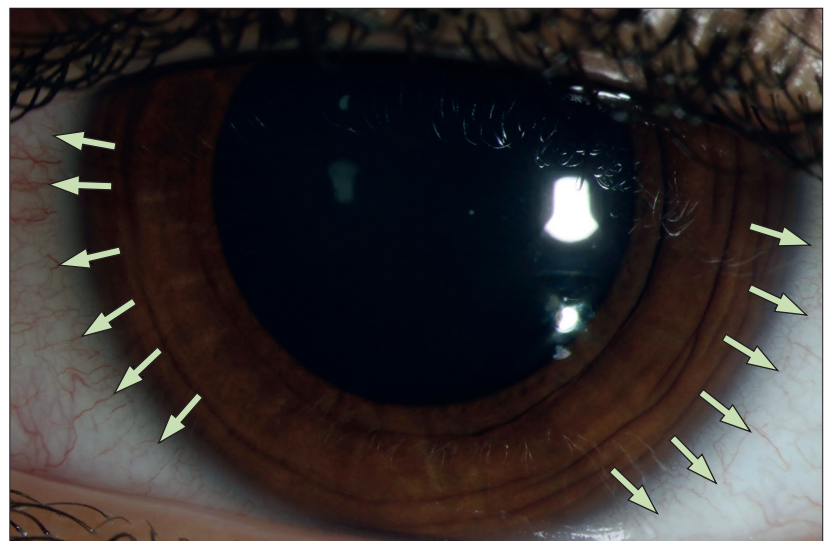


Figure: Anterior uveitis in paediatric inflammatory multisystem syndrome temporally associated with SARS-CoV-2

Left eye shows diffuse conjunctival redness (arrows) with anterior uveitis.