

BRIEF REPORT

Paediatricians face challenging times as COVID-19 can cloud other diagnoses and lead to treatment delays

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has posed major challenges for healthcare professionals worldwide, as the clinical picture of this newly discovered human pathogen is diverse. Sometimes, it leads to mild or severe forms of COVID-19 and a prolonged disease has been reported. It can also trigger multisystemic inflammatory syndrome in children (MIS-C).¹ So far, one and a half million deaths have been reported worldwide. Unfortunately, this overwhelming health problem can also cause indirect damage, because other medical problems can be overlooked, or missed.²

We describe a previously healthy 16-year-old girl who presented to our paediatric emergency department (PED) with fever, headache and back pain.

She had a history of recurrent urinary tract infections and she suffered an episode of dysuria two weeks before she presented to the PED. However, this disappeared after drinking plenty of cranberry juice. A week later, she started having fever, left-sided flank pain, vomiting and generally felt unwell. She was examined by a nasopharynx swab and underwent polymerase chain reaction testing for SARS-CoV-2, but the result was negative. Her family doctor suspected pyelonephritis and referred her to the PED.

On arrival, she appeared pale and tired and her temperature was 38°C. On physical examination, she had a tender upper abdomen and percussion tenderness at the left flank region. The pain improved after she was given ibuprofen. Blood tests showed high C-reactive protein (272 mg/L), but a normal white blood cell count ($9.6 \times 10^9/L$), normal neutrophil count ($7.1 \times 10^9/L$) and normal platelets ($203 \times 10^9/L$). She had a low plasma level of potassium (2.9 mmol/L), but normal sodium (135 mmol/L) and creatinine (59 $\mu\text{mol/L}$). Her urinary dipstick showed 1+ for protein, 2+ for haemoglobin as she was menstruating, but was negative for nitrite and leucocyte esterase.

The girl's Doppler ultrasound showed reduced perfusion of one kidney. A chest X-ray was also performed, but it did not show any pathology. The patient received the working diagnosis of MIS-C, mainly due to her high C-reactive protein level and was admitted for observation, without antibiotics, and with a preliminary plan to proceed with anti-inflammatory treatment for MIS-C. Additional tests were performed and supported the presence of high inflammation: erythrocyte sedimentation rate 114 mm/hour, serum ferritin 423 $\mu\text{g/L}$, D-dimer 1.33 mg/L and fibrinogen 8.4 g/L.

When her temperature started to rise to 39°C shortly after admission, intravenous cefotaxim treatment was instigated. However, the first dosage was given more than 12 hours after her presentation to the PED. When the culture from her mid-stream urine sample came back the next day, it showed a significant growth of *Escherichia coli* ($>10^5$ colony-forming units/mL), which supported the diagnosis of a urinary tract infection. The patient recovered rapidly with intravenous antibiotics and was switched to oral treatment after a couple of days. Dimercaptosuccinic acid scintigraphy was performed seven days after admission and this showed decreased uptake of the isotope in the left kidney, with a reduction in the relative function of the left kidney, which was 43% compared to the 57% in the right kidney. This confirmed pyelonephritis (Figure 1).

This paper describes a typical clinical picture of pyelonephritis, which was initially missed or confused with MIS-C. This led to a delay in antibiotic treatment, but with a seemingly good outcome for the patient. Although our patient's history may be quite common, several important issues need to be pointed out. First, MIS-C may be difficult to distinguish from severe bacterial infections. This is important because the two conditions are treated differently, one with immunosuppression and the other with antibiotics. Omitting or delaying antibiotic treatment may have severe consequences, as it has been suggested that delayed treatment is one of the most important risk factors for renal scarring after pyelonephritis.³ In addition, steroids and other immunosuppressive medication may worsen the course and outcome of bacterial infections. The second important point is that a urine dipstick has high sensitivity for leucocyte esterase and nitrite, but it is only a screening tool and not a diagnostic tool for urinary tract infections. A negative dipstick does not exclude an urinary tract infection.⁴ Thirdly, dimercaptosuccinic acid scintigraphy may be a very useful tool in diagnosing acute pyelonephritis.⁵

This case underlines the need for high levels of vigilance during the COVID-19 pandemic, to minimise collateral damage. A urinary tract infection is still one of the most common, and most serious, bacterial infections in children and delayed treatment can have serious consequences, such as renal scarring, which may lead to hypertension, proteinuria and chronic kidney disease.³ Reaching a correct diagnosis can sometimes be like solving a puzzle and it is vital that physicians interpret laboratory tests and radiological examinations

Abbreviations: SARS-CoV-2, severe acute respiratory syndrome coronavirus 2; PED, paediatric emergency department; MIS-C, multisystemic inflammatory syndrome in children.

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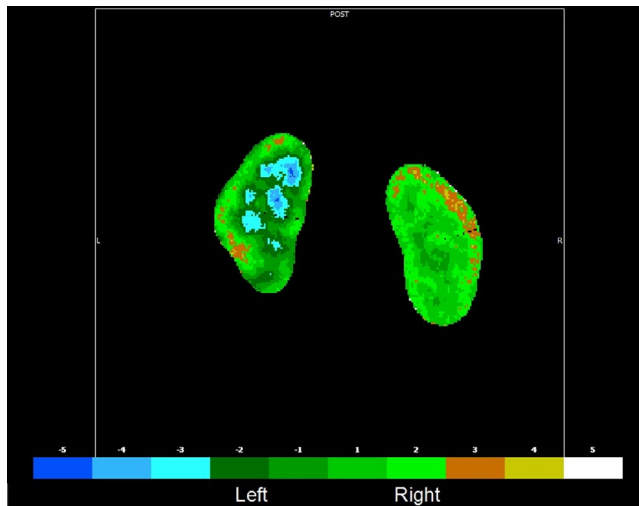


FIGURE 1 Dimercaptosuccinic acid scintigraphy during the acute phase of the disease showed decreased uptake of the isotope in the left kidney, with a reduction in relative function of 43%, compared to 57% in the right kidney. This confirmed acute pyelonephritis. The colours correspond to the intensity of perfusion, according to the scale on the bottom of the figure

with caution. It is important to bear COVID-19 in mind, but it is equally important not to let it cloud other diagnoses.

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

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