

## Multiple drugs

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**Acute kidney injury and off label use: 3 case reports**

In a retrospective observational study of 238 patients admitted at hospital in China from 24 January 2020 to 20 March 2020, 3 patients (2 boys and 1 girl) aged 10 months–8 years were described, who developed acute kidney injury (AKI) during off label treatment with meropenem, linezolid, oseltamivir, ribavirin, caspofungin or umifenovir for Coronavirus disease 2019 (COVID-19). Additionally, all these patients received off label treatment with immune-globulin and unspecified corticosteroids for COVID-19 [dosages and durations of treatments to reactions onset not stated; not all routes and outcomes stated].

Patient 1: A 13-month-old boy, who was diagnosed with COVID-19, was admitted in Jan 2020. Subsequently, he started receiving off label treatment with meropenem, linezolid, oseltamivir, IV immune-globulin and unspecified corticosteroids for COVID-19. However, his condition became critical. Due to his critically ill condition, he was shifted to the ICU on 27 January 2020. On the first day of ICU admission laboratory investigations showed increased blood urea nitrogen (BUN), serum creatinine (SCR) was 224  $\mu\text{mol/L}$  and estimated glomerular filtration rate (eGFR) was 17 mL/min/1.73m<sup>2</sup>. Also, he experienced acidosis and proteinuria. Based on these findings and clinical presentation, he was diagnosed with stage 3 AKI. Additionally, ascites and enlarged kidneys were observed. He was placed on ventilation. Also, he received plasma exchange (PE) and continuous kidney replacement therapy (CKRT). Heparin was used for anticoagulation both in CKRT and PE. Additionally, he was treated with continuous veno-venous hemodiafiltration (CVVHDF) for oliguria and kidney failure. Thereafter, his condition recovered, and he was discharged from the ICU following a duration of 17 days.

Patient 2: A 10-month-old girl, who was diagnosed with COVID-19, was admitted in 2020. Subsequently, she started receiving off label treatment with meropenem, linezolid, ribavirin, IV immune-globulin and unspecified corticosteroids for COVID-19. However, her condition became critical. Due to her critically ill condition, she was shifted to the ICU on 03 February 2020. On the first day of ICU admission laboratory investigations showed increased blood urea nitrogen (BUN), serum creatinine (SCR) was 206.3  $\mu\text{mol/L}$  and estimated glomerular filtration rate (eGFR) was 19 mL/min/1.73 m<sup>2</sup>. Also, she experienced acidosis, proteinuria and mild hematuria. Based on these findings and clinical presentation, she was diagnosed with stage 3 AKI. Additionally, ascites and enlarged kidneys were observed. Also, she developed intussusception secondary to COVID-19. She was placed on ventilation. Also, she was treated with plasma exchange (PE) and continuous kidney replacement therapy (CKRT). Heparin was used for anticoagulation both in CKRT and PE. Additionally, she was treated with continuous veno-venous hemodiafiltration (CVVHDF) for oliguria and kidney failure. Eventually, despite intensive surgical and medical interventions, she died due to intestinal necrosis and sepsis secondary to intussusception [aetiology of intussusception not stated].

Patient 3: An 8-year-old boy, who had acute lymphoblastic leukaemia, was diagnosed with COVID-19 and admitted in 2020. Subsequently, he started receiving off label treatment with meropenem, linezolid, caspofungin, ribavirin, umifenovir [arbidol], IV immune-globulin and unspecified corticosteroids for COVID-19. Additionally, he was receiving unspecified chemotherapy concomitantly. His condition eventually became critical. Due to his critically ill condition, he was shifted to the ICU on 17 February 2020. On the first day of ICU admission laboratory investigations showed blood urea nitrogen (BUN) was 2.9 mmol/L, serum creatinine (SCR) was 21.2  $\mu\text{mol/L}$  and estimated glomerular filtration rate (eGFR) was more than 120 mL/min/1.73 m<sup>2</sup>. Most severe BUN was 8 mmol/L. Based on these findings and clinical presentation, he was diagnosed with stage 2 AKI. He was placed on ventilation. Also, he received plasma exchange (PE) and continuous kidney replacement therapy (CKRT). Heparin was used for anticoagulation both in CKRT and PE. Additionally, he was treated with continuous veno-venous hemodiafiltration (CVVHDF) in the setting of significant fluid overload. Thereafter, his condition improved, and he was successfully weaned off ventilation and kidney replacement therapy.