Methotrexate/prednisolone

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COVID-19: case report

A 5-year-old boy developed COVID-19 following treatment with methotrexate and prednisolone for systemic lupus erythematosus [*routes not stated*].

The boy presented to the pediatrician due to fever, abdominal pain and productive cough. Ten months prior to the presentation, he was diagnosed with systemic lupus erythematosus and received treatment with methotrexate 25 mg every week, prednisolone 15 mg/day and hydroxychloroquine [hydroxychloroquine sulfate]. But, in late April [*year not stated*], he presented to the pediatrician due to fever, abdominal pain and productive cough. Subsequently, COVID-19 with elevated inflammatory markers, continued arthralgias and high muscle enzymes was suspected. He had not achieved remission of systemic lupus erythematosus due possible COVID-19 symptoms. Hence, off-label treatment one dose of azithromycin 10 mg/kg per dose was given for COVID-19. However, his work of breathing increased and he was brought to the emergency department. He was found tachypneic with decreased bibasilar breath sounds and oxygen saturation at 77% on room air. Therefore, he was placed on a non-rebreather mask at 100% oxygen saturation. However, he had persistent retractions that required high-flow nasal cannula. His RT-PCR test showed positive result for SARS-CoV-2 infection. His initial investigation revealed lymphopenia with increased inflammatory markers, erythrocyte sedimentation rate, C-reactive protein, coagulopathy markers, D-dimer and fibrinogen. He also had high level of lactate dehydrogenase. His chest X-ray showed midlung predominant airspace opacities, bilaterally. After admission to the paediatric ICU, non-invasive respiratory support and prone positioning were attempted to maintain oxygen saturation. A second dose of off-label treatment with azithromycin 10 mg/kg per dose was given. Additionally, high dose of hydroxychloroquine 220mg twice a day as an off-label treatment was given and returned to baseline dose hydroxychloroquine. On the following day, his laboratory testing showed persistent elevations in C-reactive protein, D-dimer and lactate dehydrogenase. He had new elevation in ferritin level. On the basis of his laboratory findings, COVID-19 complicated by acute respiratory distress syndrome was suspected [*duration of treatment to reaction onset not stated*].

The boy started receiving off-label treatment with hydrocortisone 100 mg/m^2 every day (divided every six hours) with methylprednisolone 1 mg/kg per day (divided twice a day) and anakinra 10 mg/kg/day (divided every six hours). Additionally, ceftriaxone and enoxaparin-sodium [enoxaparin] were initiated. By hospitalisation day 2, he developed significant respiratory decompensation with decrease in oxygen saturation to 55%. Hence, intubation and ventilator support was provided. But, his chest X-ray revealed increased opacities and he remained sedated during intubation. He underwent neuromuscular blockade and scheduled proning. He started receiving remdesivir 5 mg/kg on hopitalisation day 2 and then 2.5 mg/kg/day from hopitalisation day 4 to day 11 as compassionate use for COVID-19. Serum testing revealed mild elevation in IL-6 and IL-2 soluble receptor and normal IL-1. By hospitalisation day 3, his C-reactive protein, lactate dehydrogenase and ferritin begun to decrease and X-ray of the chest showed stable lung opacities with partial clearing and improved aeration on hospitalisation day 4. Subsequently, hydrocortisone was weaned off and anakinra was discontinued. His repeat X-ray of the chest showed persistent opacities and diminished bibasilar lung sounds. He remained ventilator dependent. Thus, off-label treatment with two doses of tocilizumab 8 mg/kg and one dose of convalescent-anti-SARS-CoV-2-plasma [convalescent plasma] for COVID-19 was initiated on hospitalisation day 7. Eventually, slight lung improvement was noted upon chest X-ray. After nine days of mechanical ventilation, he was extubated to bilevel positive airway pressure to IPAP 16, PEEP 6, and FiO2 30%. Subsequently, he had significant improvement in the inflammatory and coagulopathy markers. He was weaned to room air after extubation and his tests for SARS-CoV-2 showed negative result. Subsequently, he had continued improvement and discharged from hospital. His chest X-ray showed some residual opacities at the time of discharge. At the follow-up visit, he had no cough or shortness of breath.

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