JT04

A case of severe COVID-19 treated with additional steroids after dexamethasone discontinuation

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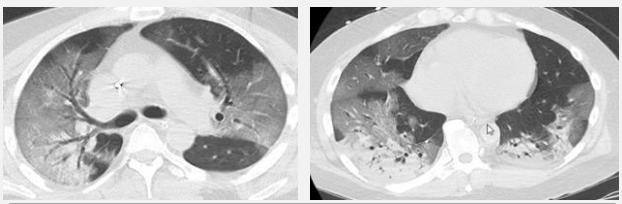
Introduction

The use of dexamethasone at a dosage of 6 mg/day for up to 10 days has been shown to reduce the 28 day-mortality rate in COVID-19 patients who required oxygen and/or ventilation[1]. Rapid Living recommendations regarding COVID-19 drug therapy in the special edition of the Japanese Clinical Guidelines for Management of Sepsis and Septic Shock 2020 also strongly recommends steroid administration for patients who require oxygen therapy. However, there are some cases of recurrent respiratory distress after the discontinuation of steroids.

It is unclear whether additional steroids are needed if inflammation persists and lung injury worsens after 10 days. We report a case of successful outcome with additional steroid administration.

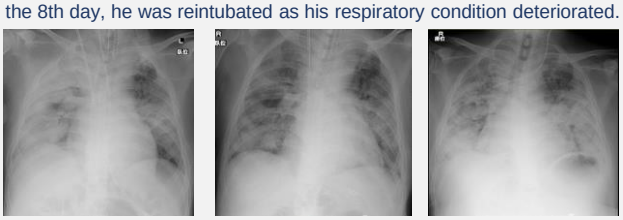
Case presentation

The patient was a 49-year-old male with a history of hypertension and chronic kidney disease (after renal transplantation). He had received his second dose of the COVID-19 vaccination seven months earlier. He developed a fever and a cough, followed by respiratory distress and malaise 17 days later. He tested positive for COVID-19 by polymerase chain reaction (PCR). Upon admission, his temperature was 38.8 ℃, SpO_2 91 % (high-flow nasal cannula, FiO_2 90 %, 40 L/min), respiratory rate 52 breaths/min. He was admitted to the ICU, intubated, and started on dexamethasone at 6 mg/day.



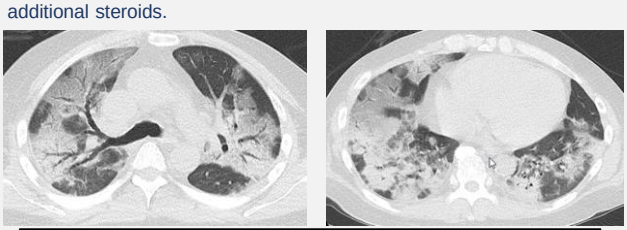
CT findings on the day of admission showed bilateral ground glass opacity, air bronchograms, and atelectasis.

On the 5th day of hospitalization, he was extubated due to improvement of his respiratory status. However, he developed a fever and an elevated CRP again after the dose of dexamethasone was reduced. On the 8th day, he was reintubated as his respiratory condition deteriorated.



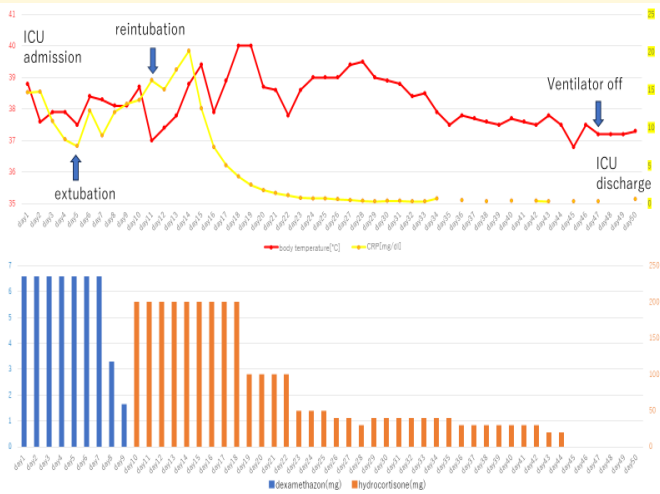
Day1 Day5 Day10

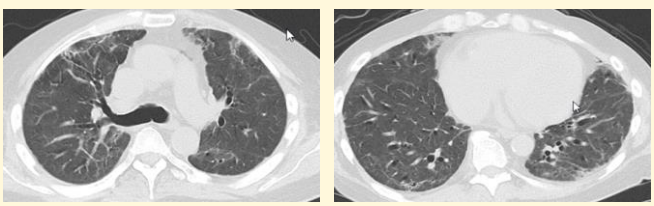
A chest CT scan showed progression of ground glass opacities. No significant causative organisms were identified in various cultures. We suspected a flare-up of inflammation and decided to administer additional steroids.



CT findings before reintubation showed a worsening of ground glass opacity , infiltration and traction bronchiectasis

We started a second course of steroids with hydrocortisone at 200 mg/day. After restarting steroids, CRP showed a slow downward trend and his respiratory condition improved. Steroid dose was gradually tapered while confirming that there was no recurrence of inflammation. He was weaned off ventilation on the 47th day of hospitalization. He was discharged on the 75th day after hospitalization.





CT at discharge

Discussion

It has been reported that dexamethasone administration for 10 days improves the 28 day-mortality rate in COVID-19 patients requiring oxygen and/or ventilation. Since then, we have treated a number of cases with severe COVID-19 in which steroids were effective. However, there was one case in which the respiratory condition worsened again after discontinuing steroids. This was a case in which steroids were re-administered in a situation where re-exacerbation of viral inflammation was suspected, and a favorable outcome was obtained.

However, it is difficult to clearly differentiate whether the cause of respiratory failure in patients with severe COVID-19 is due to viral inflammation, bacterial pneumonia, or pulmonary edema. We considered re-administration of steroids based on CT scans, X-rays, sputum culture, blood culture, PCT, BNP, and echocardiograms. If worsening of ground glass opacities, consolidation, traction bronchiectasis and fibrosis is present, recurrence of viral inflammation is to be considered.

A second course of steroids may be effective in patients whose respiratory status worsens after steroid discontinuation. However, the optimal type of steroid, dosage, and duration of administration are not clear, so future research is necessary.

Conclusion

Additional steroid administration may be effective for patients with severe COVID-19 who show a worsening of respiratory status after the discontinuation of steroids.

References

1) Peter Horby, Wei Shen Lim, Jonathan R Emberson et al. Dexamethasone in Hospitalized Patients with COVID-19. N Engl J Med. 2021;384(8):693-704.