

**ABSTRACT**

## **A Retrospective Study of High-dose Intravenous Vitamin C in Critically Ill Covid-19 Patients**

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### **Objectives**

High-dose intravenous vitamin C (HDIVC) has been investigated as the adjuvant therapy in critically ill Coronavirus Disease 2019 (COVID-19) patients, but the appropriate optimal doses are still unclear. This study aimed to compare the clinical outcomes of critically ill COVID-19 patients treated with 2 different dosing regimens of HDIVC (12g per day versus 6g per day).

### **Materials and methods**

A retrospective study was conducted among patients with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in intensive care unit (ICU) at Hospital Canselor Tuanku Muhriz (HCTM) Malaysia. Patients aged 18 and above receiving HDIVC 6g per day and 12g per day in the year 2021 were included in the study. Primary outcome was invasive mechanical ventilation-free days in 28 days (IMVFD28) and secondary outcomes were hospital all-cause mortality, WHO ordinal scale and C- reactive protein (CRP) levels.

### **Results**

The invasive mechanical ventilation-free days in 28 days (IMVFD28) was significantly higher in the HDIVC 6g/day group compared to the HDIVC 12g/day group [22.5 days (IQR, 18.5,25.0) and 13.5 days (IQR, 0.0,22.8) respectively ( $p = 0.017$ )]. Hospital all-cause mortality was significantly lower in patients receiving 6g/day of HDIVC ( $n = 9/30$ ) compared to 12g/day ( $n = 17/24$ ) ( $\chi^2 = 8.90$ ;  $p = 0.003$ ). Among patients receiving 6g/day, 60% of them demonstrated at least 1 point improvement of WHO ordinal scale on day 7, whereas only 20.8% in HDIVC 12g/day group had at least 1 point improvement on day 7 compared to baseline ( $\chi^2 = 10.10$ ;  $p$ -value = 0.006). CRP levels in both arms showed decreasing trend after administration of HDIVC.

## Conclusion

High-dose intravenous vitamin C of 6 grams per day resulted in better primary and secondary outcomes compared to 12 grams per day. The finding of this study provides preliminary guidance to HDIVC dosing strategy in future practice. Further studies may be needed to explore the efficacy and safety of HDIVC in COVID-19 patients.

## References

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