AUSTRALIAN COMMISSION
ON SAFETY AND QUALITY IN HEALTH CARE

NSQHS STANDARDS

GUIDANCE
for health service organisations

Position Statement

Ascorbic Acid: Intravenous high dose in COVID-19

Position

In severe cases, COVID-19 can be complicated by acute respiratory disease syndrome (ARDS), sepsis and septic shock.

Ascorbic acid (or vitamin C) is an antioxidant and cofactor for numerous physiologic reactions. In the presence of infection or sepsis serum concentrations of vitamin C may become deficient.

Use of ascorbic acid **potentially supports host defences** against infection and protects host cells against infection induced oxidative stress, for instance, during acute respiratory illness such as pneumonia.

However, there is no robust scientific evidence to support the usage of high dose intravenous ascorbic acid in the management of severe cases of COVID-19.

More research is needed before its use can be recommended.

Background

In early 2020, it was reported that China had initiated research on the use high-dose intravenous ascorbic acid in the management of ICU patients with severe COVID-19 – associated pneumonia.

On 27 March 2020, the TGA published an alert entitled **No evidence to support intravenous high-dose vitamin C in the management of COVID-19**.

In addition, the Society of Critical Care Medicine and the European Society of Intensive Care Medicine released new guidelines (March 2020) on the management of the critically ill with COVID-19. These guidelines **do not** include use of any form of ascorbic acid (vitamin C) in their recommendations: **Surviving Sepsis Campaign: Guidelines on the Management of Critically Ill Adults with Coronavirus Disease 2019 (COVID-19)**.

In the US, according to the American Society of Health-System Pharmacists (ASHP) **Assessment of evidence for COVID-19-Related Treatments**, high dose infusion of ascorbic acid is not recommended.

Further information

A **phase 2 randomised placebo-controlled trial** is underway in China to evaluate high-dose intravenous ascorbic acid in ICU patients with severe COVID-19 – associated pneumonia. The dosage regimen studied is:

- Ascorbic acid 12 g intravenously every 12 hours for 7 days
- 12 g of drug diluted in sterile water for injection to total volume of 50 mL
- Intravenous infusion rate: 12 mL/hour.

Whilst this trial may provide more information for this specific use, the overall use of ascorbic acid has not been associated with any consistent clinical benefit in critical illness.

In addition, these are massive doses used in the above-mentioned study out of China for COVID-19 which would potentially rapidly deplete available supplies.

Various lower dosages of intravenous ascorbic acid have been used in sepsis studies, for example, 50 mg/kg every 6 hours for 4 days.

A recently published (JAMA 2020) **multi-centre open-label randomised controlled trial** was conducted in ICUs in Australia, New Zealand and Brazil, to assess whether "vitamin C, hydrocortisone, and thiamine are more effective than hydrocortisone alone in expediting resolution of septic shock". The findings suggest that this combination of medicines does not lead to a more rapid resolution.

04/2020

The World Health Organisation (WHO) has published 'interim guidance' (13 March 2020) on the **Clinical management of severe acute respiratory infection (SARI) when COVID-19 disease is suspected**.

The Centre for Disease Control in the US do not include ascorbic acid as a treatment option for patients with COVID-19: **Information for Clinicians on Therapeutic Options for COVID-19 Patients**.

Oral supplementation

The effect of oral ascorbic acid supplementation has been studied extensively and is known to lead to a decrease in the duration of symptoms of the 'common cold'.

Oral supplementation may also decrease incidence of the common cold in individuals under heavy physical stress but not in the overall population. There is limited study data available regarding ascorbic acid (oral) in hospitalised patients with pneumonia.

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If you have feedback regarding this position statement, please email: **medsafety@safetyandquality.gov.au**