

High pressure (hyperbaric) oxygen resolves severe COVID-19 breathing difficulties faster than standard therapy

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High pressure (hyperbaric) oxygen resolves severe breathing difficulties in COVID-19 patients much more quickly than standard therapy, taking an average of 3 rather than 9 days, reveal the results of a small

comparative clinical trial published online in *Emergency Medicine Journal*.

This method of [oxygen](#) delivery is safe and effective for treating very sick COVID-19 patients, added to which portable hyperbaric chambers avoid the need to transfer patients elsewhere, so curbing the risk of virus spread, say the researchers.

Hyperbaric oxygen (HBO2) [treatment](#) involves patients breathing oxygen inside a chamber at a pressure higher than the atmospheric pressure at sea level. This pressure is usually greater than 1.45 atmospheres absolute (ATA).

But this level of pressure has the potential to worsen lung inflammation and/or cause potentially dangerous fluid build-up (pulmonary oedema) in the lungs of COVID-19 patients.

While a few previously published studies have suggested that HBO2 is a safe and effective method for easing breathing difficulties, and the associated inflammation, in patients with COVID-19, well designed studies are needed to confirm this, say the researchers.

To strengthen the [evidence base](#), the researchers wanted to analyse the safety and effectiveness of HBO2 in patients with severe COVID-19, and find out if it reduced the risk of progression to respiratory distress, the need for [mechanical ventilation](#), and death.

Forty adults with COVID-19 who had been admitted to three different public hospitals in Buenos Aires, Argentina with severe breathing difficulties were randomly assigned to receive either standard therapy plus HBO2 or HBO2 alone (at 1.45 ATA).

None had been able to achieve an oxygen saturation of 90% despite

oxygen supplementation. This is regarded as the lowest safe percentage of oxygen in the blood. Their average age was 55; two thirds were men.

Standard therapy consisted of antibiotics (ceftriaxone 2 g/day and azithromycin 500 mg/day for 7days), dexamethasone 8 mg/day, paracetamol 1 g every 6 hours in case of high temperature, and monitoring for complications. Oxygen was supplied with a reservoir mask. HBO2 treatment consisted of 5 or more sessions lasting 90 minutes each.

The final analysis was based on 19 people in the HBO2 group and 20 in the comparison group.

The use of HBO2 treatment, which averaged 6 sessions, had no statistically significant effect on the incidence of respiratory distress syndrome, the need for mechanical ventilation, or death within 30 days of admission.

Four patients (3 in the comparison group and 1 in the HBO2 group) developed acute [respiratory distress](#) syndrome or required mechanical ventilation. And two died, one in each group.

But the difference in oxygen saturation before and after treatment was significant for most HBO2 sessions, and showed an immediate and successive daily improvement, and at a steeper rate, than in those given standard therapy.

The time taken to restore normal breathing was also shorter among those treated with HBO2: 3 days compared with 9 among those given standard therapy alone.

The researchers accept that their study involved a small number of patients who were relatively young. And because the study was stopped

early due to its apparent success, this limited their capacity to assess other outcomes.

Nevertheless, they write: "Our findings suggest that supplementing oxygen through HBO2 treatment contributed to an increased [oxygen saturation] in patients with COVID-19 with severe hypoxaemia [breathing difficulties], with no significant adverse effects.

"Cases of severe COVID-19 that need mechanical ventilation have a high mortality risk. Therefore, novel therapeutic strategies are needed, and this study offers evidence supporting HBO2 treatment."

They add: "This treatment could be easily available in various settings. Portable hyperbaric chambers offer a fast set up to avoid transferring patients to other hospital areas, attenuating the risk of virus transmission."

But larger trials are needed to further confirm the treatment's effects on survival, they say.

In a linked editorial, Dr. John Kirkby of Washington University in St Louis, Missouri, cautions that the patients were not necessarily typical of all those admitted to hospital with COVID-19 and severe breathing difficulties.

And because none of them received antiviral drugs or monoclonal antibody preparations, this might also suggest they had less severe infection. The hyperbaric pressure was also relatively low.

Nevertheless, Kirkby concludes: "As we all look to improve our global capabilities to combat the effects of COVID-19, this study demonstrates the value of looking to make the most of available resources to properly evaluate novel treatment modalities, such as a lower cost, portable, lower

pressure HBO2 to make a clinical impact on this pandemic."

More information: Hyperbaric oxygen as an adjuvant treatment for patients with COVID-19 severe hypoxaemia: a randomised controlled trial, *Emergency Medicine Journal* (2021).

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