



The steroid dexamethasone improves survival in severe cases of COVID-19.

# STEROID IS FIRST DRUG SHOWN TO PREVENT DEATHS FROM COVID-19

In a large trial, dexamethasone cut deaths by one-third among critically ill patients.

By Heidi Ledford

**A**n inexpensive and commonly used steroid can save the lives of people seriously ill with COVID-19, a randomized, controlled clinical trial in the United Kingdom has found. The drug, called dexamethasone, is the first shown to reduce deaths from the coronavirus that has killed more than 440,000 people globally. In the trial, it cut deaths by about one-third in patients who were on ventilators because of coronavirus infection.

“It’s a startling result,” says Kenneth Baillie, an intensive-care physician at the University of Edinburgh, UK, who serves on the steering committee of the trial, called RECOVERY. “It will clearly have a massive global impact.” RECOVERY researchers announced the findings in a press release on 16 June, and posted their results in a preprint on 22 June (P. Horby *et al.* Preprint at medRxiv <http://doi.org/dz5x>; 2020).

RECOVERY, launched in March, is one of the world’s largest randomized, controlled trials for coronavirus treatments. The dexamethasone arm enrolled 2,100 participants who received the drug at a low-to-moderate dose of 6 milligrams per day for 10 days, and compared how they fared against about 4,300 people who received standard care for COVID-19.

Dexamethasone’s effect was most striking among patients on ventilators. Those who were receiving oxygen therapy but were not on ventilators also saw improvement: their risk of dying was reduced by 20%. The steroid had no effect on people with less severe cases of COVID-19 – those not receiving oxygen or ventilation.

Shortly after the results were released, the UK government immediately authorized the use of dexamethasone for patients hospitalized with COVID-19 who required oxygen, including those on ventilators.

“Finding effective treatments like this will transform the impact of the COVID-19 pandemic on lives and economies across the world,” said Nick Cammack, head of the COVID-19 Therapeutics Accelerator at Wellcome, a UK biomedical research charity in London, in a statement. “While this study suggests dexamethasone only benefits severe cases, countless lives will be saved globally.”

## Rigorous study

Use of steroids to treat viral respiratory infections such as COVID-19 has been controversial, notes Peter Horby, an infectious-disease specialist at the University of Oxford, UK, and a chief investigator on the trial. Data from steroid trials during outbreaks of severe acute respiratory syndrome and Middle East respiratory

syndrome caused by related coronaviruses were inconclusive, he says. Nevertheless, given dexamethasone’s broad availability, and some promising results from steroid studies in previous outbreaks, RECOVERY investigators considered it important to test the treatment in a rigorous trial, says Horby.

Treatment guidelines from the World Health Organization and many countries have cautioned against treating people with coronavirus with steroids, and some investigators were concerned about anecdotal reports of widespread steroid treatment. The drugs suppress the immune system, which could provide some relief for patients whose lungs are ravaged by an overactive immune response that sometimes manifests in severe cases of COVID-19. But such patients may still need a fully functioning immune system to fend off the virus itself.

The RECOVERY trial indicates that at the doses tested, the benefits of steroid treatment can outweigh the potential harm. The study found no outstanding adverse events from the treatment, investigators said. “This treatment can be given to pretty much anyone,” says Horby.

And the pattern of response – with a greater impact on severe COVID-19 and no effect on mild infections – matches the notion that a hyperactive immune response is more likely to be harmful in long-term, serious infections, says Anthony Fauci, head of the US National Institute of Allergy and Infectious Diseases. “When you’re so far advanced that you’re on a ventilator, it’s usually that you have an aberrant or hyperactive inflammatory response that contributes as much to the morbidity and mortality as any direct viral effect.”

## Easy to administer

So far, the only other drug shown to benefit people with COVID-19 in a large, randomized, controlled clinical trial is the antiviral drug remdesivir. Remdesivir shortened the amount of time that patients might need to spend in hospital, but it did not have a statistically significant effect on deaths (J. H. Beigel *et al.* *N. Engl. J. Med.* <http://doi.org/dwkd>; 2020).

Remdesivir is also in short supply. Although the drug’s maker, Gilead Sciences of Foster City, California, is ramping up production, the drug is currently available to only a limited number of hospitals around the world. And remdesivir is complex to administer: it must be given by injection over the course of several days.

Dexamethasone, in contrast, is a medical staple found on pharmacy shelves worldwide and is available as a pill – a particular benefit as coronavirus infections continue to rise in countries with limited access to health care. “For less than £50 (US\$63), you can treat eight patients and save one life,” says Martin Landray, an epidemiologist at the University of Oxford, and another chief investigator on the RECOVERY trial.