Remdesivir is the first drug found to block the coronavirus

Preliminary results suggest that an antiviral treatment speeds recovery from COVID-19

Remdesivir, an antiviral drug that stops some viruses from making copies of their genetic material, may help COVID-19 patients recover faster.

An antiviral drug called remdesivir is the first treatment to show efficacy against the coronavirus.

Preliminary results from a clinical trial comparing the drug with a placebo suggest that remdesivir speeds recovery from COVID-19 by 31 percent, the U.S. National Institute of Allergy and Infectious Diseases said April 29 in a news release.

The international trial randomly assigned 1,063 people hospitalized with COVID-19 to get intravenous infusions of either remdesivir or a placebo. In the remdesivir group, the median time to recovery was 11 days, compared with 15 days for those on the placebo. Recovery was defined as being discharged from the hospital or being well enough to resume normal activity. Eight percent of people in the remdesivir group died, compared with 11 percent in the placebo group.

“Although a 31 percent improvement doesn’t seem like a knockout 100 percent, it is a very important proof of concept,” Anthony Fauci, director of the NIAID, said April 29 during a news briefing at the White House. “It has proven that a drug can block this virus.”
Normally, researchers would have waited to make the announcement until the results had been reviewed by other scientists, but the team chose to make the announcement early, Fauci said. “Whenever you have clear-cut evidence that a drug works, you have an ethical obligation to immediately let the people who are in the placebo group know so that they can have access.”

Remdesivir will now be the standard of care by which other drugs are judged, Fauci said. The trial will be adapted to add to the remdesivir treatment an antibody that may protect against inflammation, he said. Remdesivir, developed by biopharmaceutical company Gilead Sciences, headquartered in Foster City, Calif., mimics a building block of RNA, the coronavirus’s genetic material. When the virus copies its RNA, remdesivir is incorporated instead of the usual RNA components, stopping the virus’s replication.

In studies in lab dishes and animals, remdesivir has been effective against a wide variety of RNA-containing viruses, including those that cause MERS and SARS. “It’s passed every single milestone. It works against every coronavirus we’ve tested,” says Mark Denison, a virologist at Vanderbilt University Medical Center in Nashville, who was not involved in the study.

Remdesivir has been most effective in animal studies when given early in infections, Denison says. The drug can stop or slow viral replication but doesn’t block the body’s overzealous immune system responses that cause additional damage for many severely ill COVID-19 patients. He likens remdesivir to a fire extinguisher. “If there’s a fire, and you put it out with the fire extinguisher, you’re not going to get burned. But if you fall in [the fire] and burn your arm, you can apply the fire extinguisher and maybe you’ll limit the burn, but you can’t heal it.”

If the drug can be given early in the infection — difficult to do with a drug like remdesivir that is given intravenously and must be administered by trained medical professionals — then people might never become ill enough to need to go to the hospital. “You [could] convert this from being a lethal disease, to being a manageable, survivable disease,” Denison says. A similar compound given as an oral drug might even be used to prevent infections, Denison says.

Gilead also announced results of another remdesivir trial on April 29. That study compared a five-day course of remdesivir with 10 days of treatment. There was no control group that didn’t get the drug. It took 10 days for half of people on the shorter course of remdesivir to have clinical improvement compared with 11 days for those in the longer-treatment group.
“The study demonstrates the potential for some patients to be treated with a 5-day regimen, which could significantly expand the number of patients who could be treated with our current supply of remdesivir. This is particularly important in the setting of a pandemic, to help hospitals and health care workers treat more patients in urgent need of care,” the company said in a news release. Of the 200 people in the five-day treatment group, 129 went home from the hospital by day 14, while 106 of the 197 people who got the longer treatment were discharged by day 14.

Treating earlier was also beneficial. Sixty-two percent of patients who got treatment within 10 days of their symptoms starting were able to go home after two weeks in the hospital, but only 49 percent of those who got treatment later in the infection were discharged after two weeks in the hospital.

A smaller, incomplete study published April 29 in the Lancet appears to counter the results of the NIAID study. The Lancet study, conducted in 10 hospitals in Wuhan, China, where the pandemic first started, found no statistically significant improvement in recovery time in severely ill COVID-19 patients given remdesivir, compared with those who got a placebo.

In that study, the median time to recovery for patients taking remdesivir was 21 days, compared with 23 days for those getting a placebo. There was a trend that remdesivir sped recovery for people who had symptoms for less than 10 days, but that result didn’t meet statistical thresholds. That trial stopped early because Wuhan’s lockdown effectively stopped transmission so that researchers weren’t able to recruit enough patients to fill the trial’s slots. As a result, the trial lacked the statistical power to detect differences between the groups, Denison says.
Previous results from a study of patients given remdesivir for “compassionate use” when no clinical trial was available showed that 36 of 53 people given the drug needed less supplemental oxygen afterward, researchers reported April 10 in the New England Journal of Medicine.