A critical review on Remdesivir and other anti-COVID-19 drugs

Dr Naseem Khan, Head India-Drug Delivery and Excipients, Sredstva Regionale Chemie; **Dr Rajiv Kumar**, Managing Director, Raptech Labs; and **Zoltán Kovács**, Senior Business Development Specialist, CYCLOLAB, Budapest, trace down the various factors associated with different drugs that help in treating COVID-19

Clinical-trial data showed that Molnupiravir, developed by pharma firm Merck, based in Kenilworth, New Jersey, and the biotechnology company Ridgeback Biotherapeutics in Miami, Florida, cut hospitalisations and deaths by 30 per cent, compared with people who took placebos. Meanwhile, Paxlovid (Nirmatrelvir and Ritonavir), made by Pfizer, based in New York City, cut hospitalisations and deaths by 89 per cent. The UK regulators approved Molnupiravir in November and Paxlovid in December, and the US regulators granted emergency authorisations for both the drugs in December.

Paxlovid inhibits SARS-CoV-2's main protease, whereas Molnupiravir tricks its RNA polymerase into incorporating part of the drug into the virus's RNA, creating so many errors that it cannot survive. A third drug - Remdesivir, developed by Gilead, based in Foster City, California - inhibits RNA polymerase, but the treatment is expensive, and currently requires intravenous infusions over three consecutive days, making it inaccessible to many people.

If the treatment does not completely wipe out the virus in a patient, some of the RNA errors it creates might inadvertently give the virus resistance against the other drug in the combination. That's why it's a key priority for researchers to find an accessible drug that effectively blocks the virus's RNA polymerase, which could be used in partnership with a protease inhibitor such as Paxlovid. One option may be an oral version of Remdesivir, which Gilead is currently testing.

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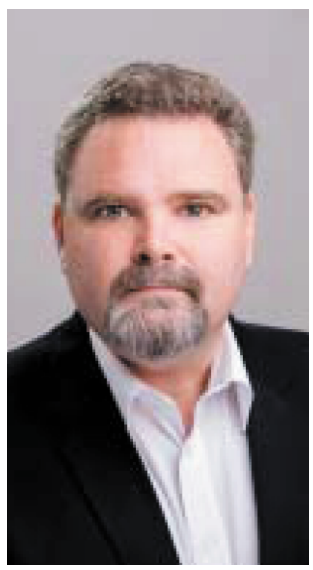

Zoltán Kovács

Remdesivir acts by inhibiting the activity of RNA polymerase, a protein that is more conserved in different SARS-Cov-2 variants than the spike protein, the target of vaccines, and Remdesivir has also shown inhibitory activity against variants

A critical review on Remdesivir

The aim of this report is to review the literature and shed light on the uncertainties surrounding the use of anti-viral agents, in general, and Remdesivir in COVID-19 patients. This review evaluated a battery of anti-viral compounds and their effectiveness in the treatment of COVID-19 since the beginning of the pandemic. Remdesivir is the only antiviral approved by the EMA and FDA for the treatment of SARS-CoV-2 infection. This work extensively reviews Remdesivir data generated from clinical trials and observational studies, paying attention to the most recent data, and focussing on outcomes to give readers a more comprehensive understanding of the results. This review also discusses the recommendations issued by official bodies during the pandemic in the light of the current knowledge. The use of Remdesivir in the treatment of SARS-CoV-2 infection is justified because a virus is the causative agent that triggers the inflammatory responses and its consequences. More trials are needed to improve the management of this disease.

It was concluded that the use of Remdesivir, when indicated, would shorten hospital stays and reduce the risk of progression to the Intensive Care Unit (ICU), and, therefore, represents a saving in staff hours and other resources. Remdesivir acts by inhibiting the activity of RNA polymerase, a protein that is more conserved in different SARS-Cov-2 variants than the spike protein, the target of vaccines, and Remdesivir has also shown inhibitory activity against variants.

Remdesivir is marketed as intravenous agent formulated by sulfobutyl beta.cyclodextrin (SBECD, Captisol, Dexolve) under the trade name Veklury (Gilead Sciences).

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