Medical Xpress

Peginterferon-lambda shows strong antiviral action to accelerate clearance of COVID-19

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Single shot of peginterferon-lambda accelerates clearance of COVID-19 infection, UHN-led study shows. Credit: UHN

A clinical study led by Dr. Jordan Feld, a liver specialist at Toronto Centre for Liver Disease, University Health Network (UHN), showed an

experimental antiviral drug can significantly speed up recovery for COVID-19 outpatients—patients who do not need to be hospitalized.

This could become an important intervention to treat infected patients and help curb community spread, while COVID-19 vaccines are rolled out this year.

"This treatment has large therapeutic potential, especially at this moment as we see aggressive variants of the virus spreading around the globe which are less sensitive to both vaccines and treatment with antibodies," says Dr. Feld, who is also Co-Director of the Schwartz Reisman Liver Research Centre and the R. Phelan Chair in Translational Liver Research at UHN.

According to the study, published today in *Lancet Respiratory Medicine*, patients who received a single injection of peginterferon-lambda were over four times more likely to have cleared the infection within seven days, when compared to a group treated with placebo.

"People who were treated cleared the virus quickly, and the effect was most pronounced in those with the highest viral levels. We also saw a trend towards quicker improvement of respiratory symptoms in the treatment group," explains Dr. Feld—who translated his knowledge of peg-interferon lambda usage for viral hepatitis to research on COVID-19 treatment.

Participants with higher viral levels (above 1 million copies per mL) were much more likely to clear infection with treatment than placebo: 79% in the treatment arm compared to 38% in the placebo group; and virus levels decreased quickly in everyone in the treatment group.

Treatment benefits and public health impact

Rapid clearance has many benefits, particularly in those with high viral levels, as those cases are associated with more severe disease and a higher risk of transmission to others. Among the 60 patients followed in the study, five went to emergency rooms with deteriorating respiratory symptoms. Of those, four were in the placebo group, while only one was in the group which received the actual drug.

Bringing down the virus level quickly prevents people from getting worse and likely reduces the risk of spreading the disease to others. This may have important additional public health impact.

"If we can decrease the virus level quickly, people are less likely to spread the infection to others and we may even be able to shorten the time required for self-isolation," says Dr. Feld.

Interferon-lambda

Interferon-lambda is a protein produced by the body in response to viral infections. It has the ability to activate a number of cellular pathways to kill invading viruses.

The coronavirus that causes COVID-19 prevents the body from producing interferons, which is one way it avoids being controlled by the body's immune system. Treatment with interferon-lambda activates those same virus-killing pathways in the cells.

Because interferon activates many virus-killing pathways, resistance due to 'new strains' of the virus, which could be an issue with some therapies, is not a concern with interferon-lambda.

Interferon-lambda is different from other interferons because it uses a receptor that is only present in some tissues in the body. It is very active in the lung, the liver and the intestine, all places where the COVID-19

virus is able to replicate, but it is not active in other places leading to a lot fewer side effects than other interferons. In the trial, those treated with interferon-lambda had similar side effects to those who received placebo.

Peginterferon-lambda (used in this study) is a long-acting version of the drug developed by Eiger BioPharmaceuticals, which can be given as a single injection under the skin with a tiny needle (like insulin).

Next steps

This was an investigator initiated phase 2, double-blind randomized study, done in Toronto, with a total of 60 participants—30 who received the drug while 30 received placebo. The study was conducted from May to November 2020, with referrals from six outpatient assessment centres.

With these positive results, a large phase 3 trial is planned to start in the near future. Additional studies are ongoing at the University of Toronto, Harvard University and Johns Hopkins University with peginterferon-lambda in hospitalized patients, and in settings where it can be used to prevent infection in those who have been exposed.

More information: *Lancet Respiratory Medicine* (2021). DOI: 10.1016/S2213-2600(20)30566-X

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