Peginterferon-lambda for the treatment of COVID-19 in outpatients

C Kandel*[1], MJ Biondi*[1,2], R. Kozak[1], MA Zahoor[1,2], I Choong[3], C Hislop[3], J Glenn[4], AJ Gehring[1,2], HLA Janssen[1,2], B Hansen[1,2], JJ Feld[1,2].
1. University of Toronto. 2. Toronto Centre for Liver Disease, 3. Eiger Biopharmaceuticals
4. Stanford School of Medicine. * Contributed equally to the work

Background: There are currently no effective treatments for outpatients with coronavirus disease 2019 (COVID-19). Interferon-lambda-1 is a Type III interferon involved in the innate antiviral response with activity against respiratory pathogens.

Methods: In this double-blind, placebo-controlled trial, outpatients with laboratory-confirmed COVID-19 were randomized to a single subcutaneous injection of peginterferon-lambda 180µg or placebo within 7 days of symptom onset or first positive swab if asymptomatic. The primary endpoint was proportion negative for SARS-CoV-2 RNA on Day 7 post-injection.

Results: There were 30 patients per arm, with median baseline SARS-CoV-2 viral load of 6.71 (IQR 1.3-8.0) log copies/mL. The decline in SARS-CoV-2 RNA was greater in those treated with peginterferon-lambda than placebo (p=0.04). On Day 7, 24 participants (80%) in the peginterferon-lambda group had an undetectable viral load compared to 19 (63%) in the placebo arm (p=0.15). After controlling for baseline viral load, peginterferon lambda treatment resulted in a 4.12-fold (95CI 1.15-16.7, p=0.029) higher likelihood of viral clearance by Day 7. Of those with baseline viral load above 10E6 copies/mL, 15/19 (79%) in the peginterferon-lambda group were undetectable on Day 7 compared to 6/16 (38%) in the placebo group (p=0.012). The odds of clearance with peginterferon-lambda compared to placebo increased with every log-increase in viral load (Figure 1). Adverse events were similar between groups with only mild reversible transaminase elevations more frequently observed in the peginterferon-lambda group.

Conclusion: Peginterferon-lambda accelerated viral decline in outpatients with COVID-19 resulting in a greater proportion with viral clearance by Day 7, particularly in those with high baseline viral load. Peginterferon-lambda may have potential to prevent clinical deterioration and shorten duration of viral shedding. (NCT04354259)

Figure 1. Probability of clearance with peginterferon lambda and placebo based on baseline viral load.