Population-level Estimation #1: Safety of HIV/HepC protease inhibitors

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SARS-Coronavirus-2

A little piece of enveloped RNA!

Antiviral searches globally
Adapted from: https://www.cebm.net/covid-19/registered-trials-and-analysis/ at 29-March

**SARS-CoV-2 Antiviral Trials**

**Antiviral drugs, non-specific**

| Interferons | Activate cytoplasmic enzymes affecting viral messenger RNA translation and protein synthesis; evidence of minor efficacy in MERS-CoV in combination with ribavirin | 4 |

**Antiviral drugs, antiretrovirals**

| ASC09 | HIV protease inhibitor; to be used in combination with ritonavir | 4 |
| Azudine | Azidocytidine nucleoside analogue; HIV reverse transcriptase inhibitor | 4 |
| Danoprevir | Hepatitis C virus NS3 protease inhibitor; to be used in combination with ritonavir | 1 |
| Darunavir | HIV protease inhibitor; used in combination with cobicistat, a CYP3A inhibitor | 2 |
| Lopinavir + ritonavir | Both HIV reverse transcriptase inhibitors; ritonavir is mainly used to enhance the action of other drugs by inhibition of CYP3A4; in vitro and possible clinical efficacy in SARS-CoV | 2 |
| Remdesivir | Nucleotide analogue; inhibitor of RNA-dependent RNA polymerase; used to treat Ebola and Marburg viruses; effective in vitro against SARS-CoV-1 and MERS and blocks infection with 2019-nCoV in vitro | 2 |
Antivirals Background

HIV antivirals

SARS

? COVID

Effectiveness
Does it work?

Safety
Does it harm patients?

Gastrointestinal events
Liver Injury
Pancreatitis
etc ...

Hepatitis C antivirals

in-vitro

X SARS

? COVID

Arrhythmia
Liver Injury
Hematologic
etc ...
HIV Antivirals Estimation

Safety Does it harm patients?

Ritonavir/lopinavir
All HIV protease inhibitors

VS

NNRTIs
Integrase inhibitors

SCCS

Cohort study of HIV treatment naïve patients (PS stratification)
HIV Antivirals Estimation

Ritonavir/lopinavir
All HIV protease inhibitors

VS

Hydroxychloroquine

Cohort study
of SARS-CoV-2 Patients
(PS stratification)

Hospital treated pneumonia
Poor outcomes

Does it work?
Effectiveness
Safety Does it harm patients?

**Hep C Antivirals Estimation**

- **Hepatitis C protease inhibitors**
- **Peginterferon alfa-2b**
- **Ribavirin**

**SCCS**

- **Cohort study**
  - Pairwise Comparisons (PS stratification)
Hepatitis C Antivirals Estimation

Cohort study pairwise comparisons of SARS-CoV-2 Patients (PS stratification)

Hospital treated pneumonia
Poor pneumonia outcomes

Hepatitis C protease inhibitors
Peginterferon alfa-2b
Ribavirin
Hydroxychloroquine
Progress

Protocol  Done!
Safety Analyses
Effectiveness Analyses  SCCS CoHORTS
Paper writing  Background and methods