

Effectiveness and safety of antiviral or antibody treatments for coronavirus

Summary

A comprehensive literature search of both electronic databases and grey literature sources resulted in 54 studies of various antiviral treatments in patients diagnosed with COVID-19, SARS, or MERS; however, no animal or human studies or ongoing trials of monoclonal antibodies could be found.

The results of the included studies proved inconclusive on the effectiveness of antiviral drugs in treating coronavirus infections, thereby preventing creation of treatment recommendations. There is a low quality of available evidence that largely consists of case reports and case series, with few observational studies, and even fewer trials. Safety signals related to the use of ribavirin were identified from the included studies, namely potential anemia or altered liver function.

Implications

The current evidence for the effectiveness of antiviral therapies for coronavirus is not conclusive and suffers from a lack of well-designed prospective trials or observational studies. None of the interventions examined in this review can be recommended for use in patients with coronavirus. The existing body of evidence is weighted heavily towards ribavirin (41/54 studies) which has not shown conclusive evidence of effectiveness so future investigations may benefit from focusing on other potential candidates for antiviral therapy

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What is the objective?

- To identify safe and effective medical countermeasures (e.g., antivirals/antibodies) to address the current outbreak of a novel coronavirus (COVID-19)

How was the review conducted?

- MEDLINE, EMBASE, the Cochrane Library, and biorxiv.org/medrxiv.org databases, and relevant grey literature sites (e.g., GIDEON, clinicaltrials.gov) were searched in early February 2020
- Single reviewers screened titles/abstracts and full-text articles, completed data abstraction, and quality appraisal (Cochrane Risk of bias, Newcastle Ottawa Scale)
- No formal statistical analysis was performed due to rapid timelines for the review (2 weeks)

What did the review find?

- 54 studies were included in the review: three controlled trials, 10 cohort studies, seven retrospective medical record/database studies, and 34 case reports or case series
- 33 studies included SARS patients, 16 included MERS patients, 3 included COVID-19 patients, and two included patients with unspecified coronavirus
- The most common treatment was ribavirin (41 studies), followed by oseltamivir (n=10) and the combination of lopinavir/ritonavir (n=7)
- Additional therapies included broad spectrum antibiotics (n=30), steroids (n=39) or various interferons (n=12)
- No eligible studies examining monoclonal antibodies for COVID-19 were identified
- One trial found that ribavirin prophylactic treatment statistically significantly reduced risk of MERS infection in people who had been exposed to the virus
- 21 studies reported rates of ICU admission in hospitalized SARS or MERS patients, none statistically significant results in favour of or against antiviral therapies
- 40 studies reported mortality rates in hospitalized SARS or MERS patients, one cohort study (MERS) and one retrospective study (SARS) found a statistically significantly higher mortality rate in patients treated with ribavirin
- 18 studies reported potential drug-related adverse effects including gastrointestinal symptoms, anemia, and altered liver function in patients receiving ribavirin