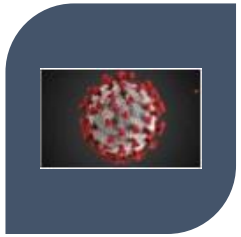
COVID-19 Updates, April 20,2020

Jorge Mera, MD, FACP
Whitney Essex, MSN, FNP-BC
Cherokee Nation Health Services



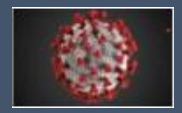
VIROLOGY

EPIDEMIOLOGY

CLINICAL MANIFESTATIONS

INFECTION CONTROL

TREATMENT



Virology:
Is SARS-CoV-2 a Natural Virus or Man-made?

- "**It is improbable** that SARS-CoV-2 emerged through laboratory manipulation of a related SARS-CoV-like coronavirus."
  - "If genetic manipulation had been performed, one of the several reverse-genetic systems available for betacoronaviruses would probably have been used. **However, the genetic data irrefutably show that SARS- CoV-2 is not derived from any previously used virus backbone**.
- "Instead, we propose two scenarios that can plausibly explain the origin of SARS-CoV-2"
  - Natural selection in an animal host before zoonotic transfer
  - Natural selection in humans following zoonotic transfer.

Theories of SARS-CoV-2 origins: NATuRe MediCiNe | VOL 26 | ApriL 2020 | 450–455 | www.nature.com/naturemedicine

Infection Control:
AHA guidance for CPR in the COVID Era

Interim Guidance for Basic and Advanced Life Support in Adults, Children, and Neonates With Suspected or Confirmed COVID-19: From the Emergency Cardiovascular Care Committee and Get With the Guidelines®-Resuscitation Adult and Pediatric Task Forces of the American Heart Association in Collaboration with the American Academy of Pediatrics, American Association for Respiratory Care, American College of Emergency Physicians, The Society of Critical Care Anesthesiologists, and American Society of Anesthesiologists: Supporting Organizations: American Association of Critical Care Nurses and National EMS Physicians

Dana P. Edelson, Comilla Sasson, Paul S. Chan, Dianne L. Atkins, Khalid Aziz, Lance B. Becker, Robert A. Berg, Steven M. Bradley, Steven C. Brooks, Adam Cheng, Marilyn Escobedo, Gustavo E. Flores, Saket Girotra, Antony Hsu, Beena D. Kamath-Rayne, Henry C. Lee, Rebecca E. Lehotzky, Mary E. Mancini, Raina M. Merchant, Vinay M. Nadkarni, Ashish R. Panchal, ... See all authors

Originally published 9 Apr 2020 | https://doi.org/10.1161/CIRCULATIONAHA.120.047463 | Circulation. ;0:null

- All rescuers should don personal protective equipment (PPE) before entering a scene to protect against both airborne and droplet particles.
- Personnel on the scene should be limited only to those essential for patient care.
- Rescuers should consider replacing manual chest compressions with mechanical CPR for patients who meet the manufacturer's height and weight criteria.
- COVID-19 status should be communicated to any new providers before arrival on the scene or when transferring the patient to a second setting.

The administration of CPR involves performing numerous aerosol-generating procedures, including chest compressions, positive pressure ventilation and establishment of an advanced airway, During those procedures, viral particles can remain suspended in the air with a half-life of approximately 1 hour and be inhaled by those nearby

Treatment: Clinical Benefit of Remdesivir in Rhesus Macaques Infected with SARS-CoV-2

- **Methods:**
  - A macaque model of SARS-CoV-2 infection was used . **Two groups of six rhesus macaques** were infected with SARS-CoV-2 and treated with intravenous remdesivir or an equal volume of vehicle solution once daily.
- **Results:**
  - **Animals treate**d with remdesivir
    - **Did not show signs of respiratory disease** and had reduced pulmonary infiltrates on radiographs.
    - Had significantly **reduced virus titers** in bronchoalveolar lavages
    - lung viral loads at necropsy (on day 7 after inoculation) were significantly lower and there was a **clear reduction in damage to the lung tissue**.
- **Conclusions:** Therapeutic remdesivir treatment initiated early during infection has a clear clinical benefit in SARS-CoV-2-infected rhesus macaques. These data support early remdesivir treatment initiation in COVID-19 patients to prevent progression to severe pneumonia.

Respiratory disease and virus shedding in rhesus macaques inoculated with SARS-CoV-2

Vincent J. Munster, Friederike Feldmann, Brandi N. Williamson, Neeltje van Doremalen, Lizzette Pérez-Pérez, Jonathan Schulz, Kimberly Meade-White, Atsushi Okumura, Julie Callison, Beniah Brumbaugh, Victoria A. Avanzato, Rebecca Rosenke, Patrick W. Hanley, Greg Saturday, Dana Scott, Elizabeth R. Fischer, Emmie de Wit

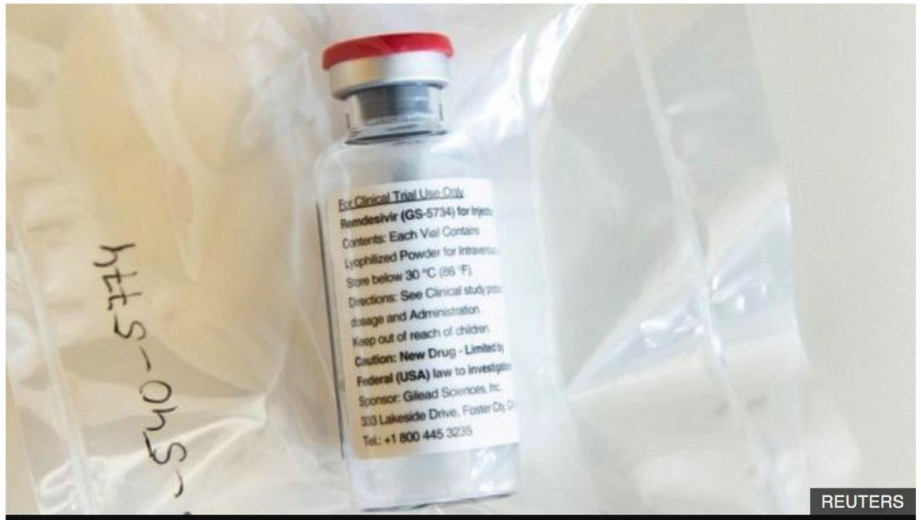
doi: https://doi.org/10.1101/2020.03.21.001628

Treatment

Hopes dashed as coronavirus drug remdesivir 'fails first trial'

23 April 2020 | 72 Share

Coronavirus pandemic

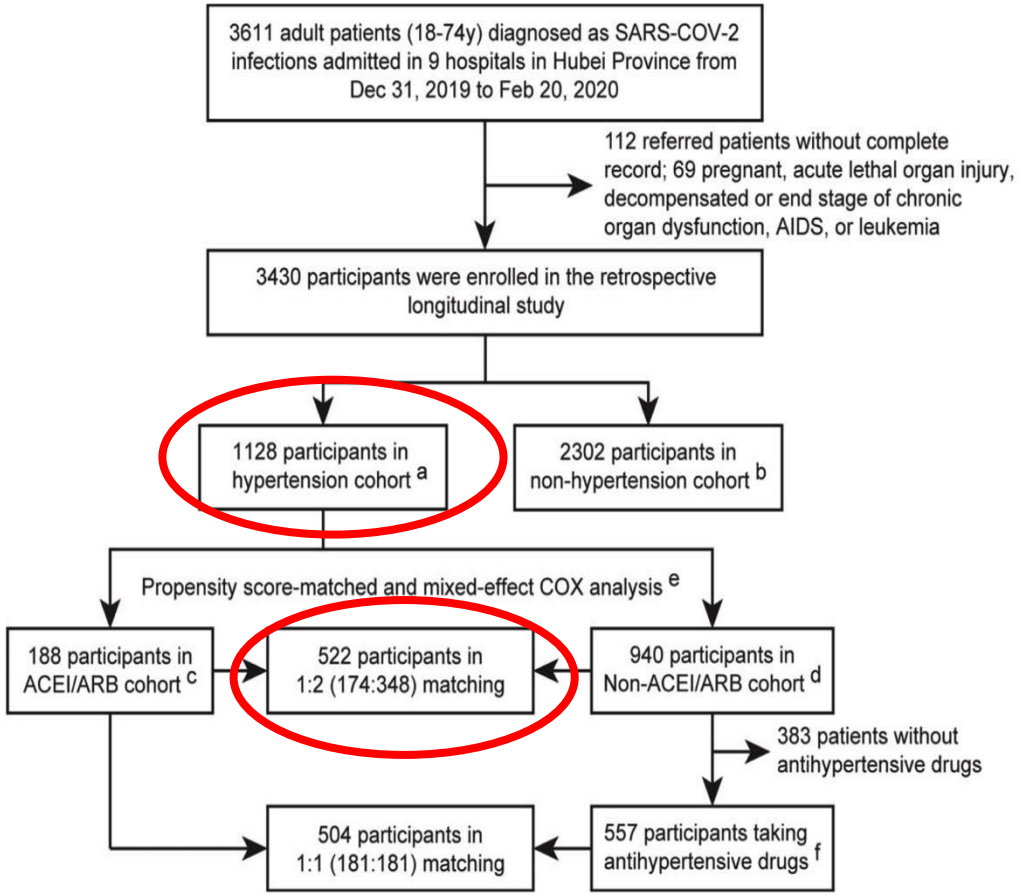


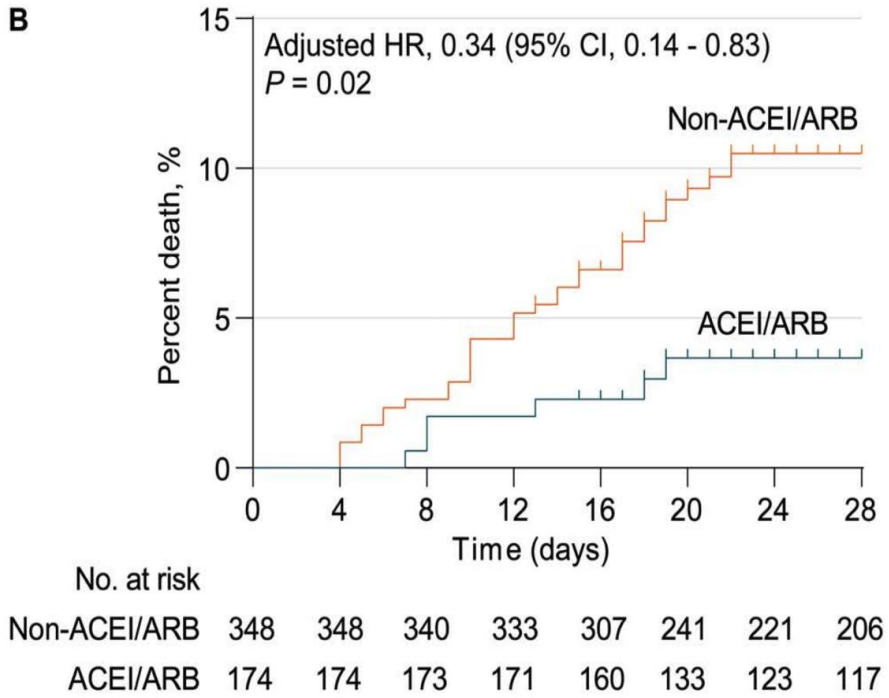
There had been been widespread hope that remdesivir could treat Covid-19

In the trial, 158 patients were randomly assigned to be given remdesivir, while 79 others had standard care with a placebo instead. There was no difference between the groups with respect to recovery time. Just under 14% of those on remdesivir died, compared with nearly 13% of those not taking the treatment.

Treatment:

Association of Inpatient Use of Angiotensin Converting Enzyme Inhibitors and Angiotensin II Receptor Blockers with Mortality Among Patients With Hypertension Hospitalized WithCOVID-19





In hospital use of ACEI/ARB is associated reduced 28-day all-cause mortality of COVID-19 compared to non-ACEI/ARB group in patients with hypertension

Treatment:

Association of Inpatient Use of Angiotensin Converting Enzyme Inhibitors and Angiotensin II Receptor Blockers with Mortality Among Patients With Hypertension Hospitalized WithCOVID-19

- HTN is the most common comorbidity of the COVID-19 and had been suggested to be associated with increased mortality.
- ACEIs and ARBs are first-line medications for a large proportion of patients with hypertension.
- Use of ACEI/ARB is a major concern for clinicians in treating COVID-19 patients with hypertension because of the potential effect of ACEI/ARB on increasing the expression of ACE2, the binding receptor and entry point of the coronavirus.
- The incidence of the 28-day all-cause death among patients who had inpatient treatment with ACEI/ARB is significant lower compared with ACEI/ARB non-users, based on the analysis of 1128 hospitalized COVID-19 patients with hypertension.
- After matching and adjusting variables may interfering the effect of ACEI/ARB, in-hospital use of ACEI/ARB still exhibits remarkable association with reduced all-cause mortality of COVID-19 patients with hypertension.

These findings clearly support recently published recommendations regarding continuation of ACEI or ARB among patients with co-existing hypertension and COVID-19.

TREATMENT

Outcomes of hydroxychloroquine usage in United States veterans hospitalized with Covid-19

- National retrospective cohort study of male patients with laboratory confirmed SARS-CoV-2 infection in an inpatient setting.
- Outcomes are discharge or death and need for mechanical ventilation
- Patients were assigned to one of three cohorts based on medication exposure to Hydroxychloroquine (HC) and azithromycin (AZ):
  - HC-treated
  - HC- and AZ-treated
  - HC-untreated.

medRxiv preprint doi: https://doi.org/10.1101/2020.04.16.20065920.

TREATMENT

Outcomes of hydroxychloroquine usage in United States veterans hospitalized with Covid-19

Outcome	HC, n=97	HC+AZ, n=113	no HC, n=158
Death	**27 (27.8%)** adjusted HR, 2.61 95% CI, 1.10 to 6.17 P=0.03	**25 (22.1%)** adjusted HR, 1.14 95% CI, 0.56 to 2.32 P=0.72	**18 (11.4%)**
Mechanical Ventilation	**13.3%** adjusted HR, 1.43 95% CI, 0.53 to 3.79 P=0.48	**6.9%** adjusted HR, 0.43; 95% CI, 0.16 to 1.12 P=0.09	**14.1%**
Risk of death after Mechanical Ventilation	adjusted HR, 4.08 95% CI, 0.77 to 21.70 P=0.10	adjusted HR, 1.20 95% CI, 0.25 to 5.77 P=0.82	

medRxiv preprint doi: https://doi.org/10.1101/2020.04.16.20065920.

HC: Hydroxychloroquine; AZ: Azithromycin

TREATMENT

Outcomes of hydroxychloroquine usage in United States veterans hospitalized with Covid-19

- Hydroxychloroquine (HC) use with or without co-administration of azithromycin did not improve mortality or reduce the need for mechanical ventilation in hospitalized patients.
- HC use alone was associated with an increased risk of mortality
- Patients in the HC-Only group had more severe disease but the risk of overall mortality in persisted after adjusting for the propensity of being treated with the drug.
- That there was no increased risk of ventilation in the HC-only group suggests that mortality in this group might be attributable to drug effects on or dysfunction in non-respiratory vital organ systems.
- Therefore, the results may not necessarily reflect outcomes in women or in younger hospitalized populations, nor can they be extrapolated to pediatric patients. Our findings may also be influenced by the demographic

medRxiv preprint doi: https://doi.org/10.1101/2020.04.16.20065920.