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FEATURES, EVALUATION, AND TREATMENT OF COVID 19

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Abstract:

This study investigates the clinical presentation, transmission, laboratory findings, and treatment outcomes of COVID-19 patients. Data was collected from hospital records, government health portals, and published literature, focusing on patients confirmed COVID-19 positive by RT-PCR. The study includes all age groups and genders, while excluding suspected cases without confirmatory test results and patients with incomplete data. Data analysis categorized patients based on age, gender, symptoms, test types, treatment methods, and outcomes, with comparisons made between mild, moderate, and severe cases.

Common symptoms identified were fever, dry cough, fatigue, sore throat, and loss of taste/smell. Severe cases included pneumonia, ARDS, thrombosis, and multi-organ failure. Transmission occurs primarily through respiratory droplets and aerosols, with an incubation period of 2-14 days. Laboratory findings showed decreased lymphocyte count, elevated inflammation markers (CRP, D-dimer, ferritin), and positive PCR or antigen tests. Imaging revealed bilateral ground-glass opacities on chest X-ray/CT.Most patients, especially those with mild to moderate cases, recovered without hospitalization. Complications included pneumonia, ARDS, blood clots, and long COVID. Mortality was higher among elderly patients and those with comorbidities. The findings underscore the importance of preventive measures such as hand hygiene, social distancing, and quarantine to control the spread of the virus.

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INTRODUCTION:

The human body is constantly at risk of infections caused by a wide range of microorganisms, including viruses, bacteria, fungi, protozoa, and helminths. These pathogens can lead to tissue damage through various biological processes. Among them, viruses stand out due to their distinctive ability to hijack the host's cellular machinery for replication. They also possess a remarkable capacity for rapid mutation and adaptation, allowing them to thrive in diverse species.

COVID-19 is an infectious disease resulting from the novel coronavirus known as SARS-CoV-2. The World Health Organization (WHO) was first alerted to the emergence of this virus on December 31, 2019, after a group of pneumonia cases of unknown origin was reported in Wuhan, China. Following this initial alert, the virus spread swiftly across China and then globally, raising serious concerns for public health systems worldwide.

On January 30, 2020, WHO officially declared the COVID-19 outbreak a global public health emergency. In India, the first confirmed case of COVID-19 was recorded on January 27, 2020, in the state of Kerala. Since that time, the number of reported cases has varied significantly across different regions of the country. Detection of infections is primarily carried out through diagnostic methods such as the Real-Time Reverse Transcription Polymerase Chain Reaction (RT-qPCR) test and the Rapid Antigen Test (RAT), which identify SARS-CoV-2 viral antigens.

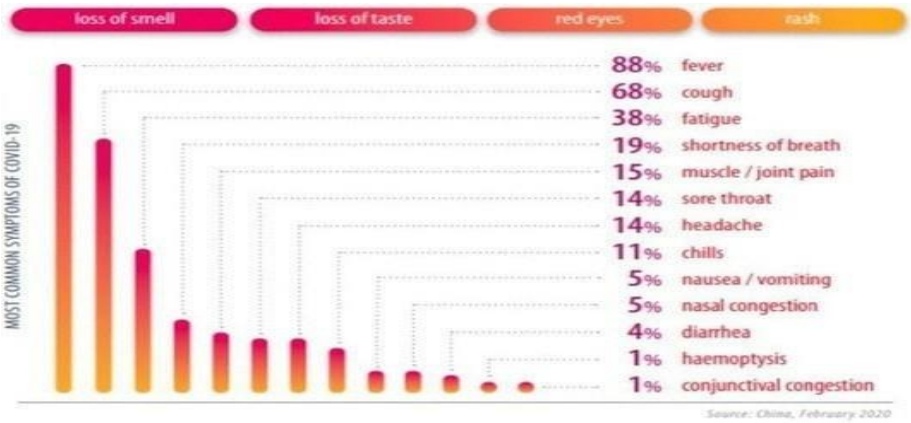
ORIGIN OF THE VIRUS

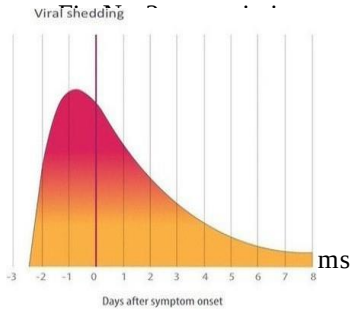
The most probable origin of the outbreak is a viral spillover from an intermediate animal host to humans. The earliest confirmed human case began showing symptoms on December 1st, but this individual had no direct connection to the suspected seafood market in Wuhan, China. It is also possible that infections occurred as early as mid-November or before. Environmental testing at the market detected the presence of the virus, particularly in sections where wild and domesticated animals were sold. This market may have either been the source of the virus or served as a significant location that accelerated its early transmission among humans.

Fig No.1.Structure Of VIRUS

SYMPTOMS

OVID-19, caused by the SARS-CoV-2 virus, presents with a wide range of clinical symptoms that vary in severity from mild to life-threatening. The most commonly observed symptoms in individuals infected with the virus are fever, dry cough, and fatigue. These initial signs are typically seen within a few days after exposure and represent the body's immune response to the viral infection.





Apart from these core symptoms, a number of other manifestations have been reported, although they may occur less frequently. These include the sudden loss of the senses of taste (ageusia) or smell (anosmia), which are often early indicators of infection. Many patients also experience nasal congestion, sore throat, and headaches. Conjunctivitis, or inflammation of the eyes, may appear in some cases, often referred to as red or irritated eyes. General body discomfort, including muscle or joint pain, is another symptom that contributes to overall fatigue and malaise.

Additionally, dermatological symptoms such as skin rashes, which may vary in appearance, have been observed in some individuals. Gastrointestinal symptoms like nausea, vomiting, and diarrhea can also occur, and are sometimes the primary complaint in infected individuals. Others may feel chills or experience dizziness, especially during the early stages of infection.

When the disease progresses to a more severe stage, it can lead to serious complications. Symptoms of severe COVID-19 include shortness of breath or difficulty breathing, a significant loss of appetite, confusion or disorientation, and continuous pressure or pain in the chest. A persistent high fever—typically above 38°C (100.4°F)—is also a warning sign of worsening illness. Individuals experiencing any of these severe symptoms should seek immediate medical attention, as they may indicate a need for urgent care or hospitalization to prevent further complications or organ damage.

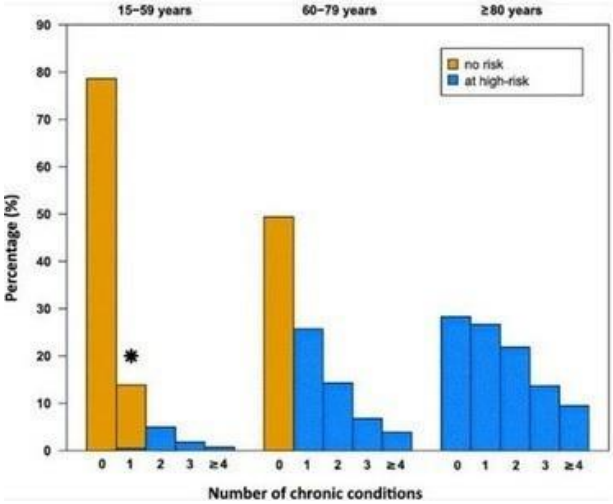
Transmission of COVID-19

COVID-19 primarily spreads from one person to another through respiratory droplets released when an infected individual coughs, sneezes, speaks, or breathes. These droplets, which may contain the virus, can be inhaled by individuals who are in close proximity to the infected person, typically within a range of about one meter. In addition to airborne transmission, the virus can also be contracted by touching surfaces or objects contaminated with these droplets. When a person touches such contaminated surfaces and then touches their face—especially the mouth, nose, or eyes—they risk becoming infected.

The period between exposure to the virus and the onset of symptoms, known as the incubation period, can vary. It generally ranges from 1 to 14 days, with most individuals developing symptoms within five to six days after exposure. Research indicates that over 97% of individuals who become infected with COVID-19 begin to show symptoms within two weeks. This window of time is crucial for monitoring exposed individuals and implementing quarantine measures to prevent further spread. Understanding the modes of transmission and the incubation timeline is vital in reducing the risk of infection and implementing effective public health strategies such as physical distancing, hygiene practices, and timely testing.

Risk groups

Fig No.4.low risk & high risk



Risk Levels and Diagnosis of COVID-19

Low-Risk:

Studies involving contact tracing have shown that children and young adults are susceptible to COVID-19 infection and can contribute to its transmission. However, these groups typically exhibit mild symptoms and rarely develop severe illness. Their risk of complications is considered low, although they can still play a role in spreading the virus to more vulnerable populations.

High-Risk:

The likelihood of developing severe complications from COVID-19 increases with age and the presence of underlying health conditions. Individuals with chronic illnesses such as hypertension, diabetes, heart disease, chronic respiratory disorders, and cancer are particularly vulnerable. These groups are at greater risk of hospitalization, critical illness, and even mortality, making preventive care and early intervention essential.

Diagnosis:

To confirm a COVID-19 infection, two primary diagnostic methods are used: the PCR test and the antigen test.

- **PCR Test (Polymerase Chain Reaction):** This test detects the genetic material of the virus, making it the most accurate and dependable method for identifying active infections. It uses a laboratory technique known as reverse transcription polymerase chain reaction (RT-PCR), also referred to as a nucleic acid amplification test (NAAT).
- **Antigen Test:** While faster, antigen tests are generally less accurate than PCR tests and may yield false negatives, especially in asymptomatic individuals or during early infection stages.-

MATERIALS AND METHODS:

Materials Used

Diagnostic Tools

- **RT-PCR Kits**: Used for detecting the viral RNA of SARS-CoV-2, offering high sensitivity and accuracy.
- **Rapid Antigen Test Kits**: Enable faster diagnosis by detecting viral proteins, though with lower sensitivity compared to RT-PCR.
- **Pulse Oximeters**: Measure oxygen saturation levels to monitor respiratory function.
- **Thermometers**: Used for regular monitoring of body temperature.
- **Chest X-rays and CT Scans**: Assist in evaluating the extent of lung involvement in suspected or confirmed COVID-19 cases.

Treatment Materials

- **Medications**: Included commonly used drugs such as Paracetamol (for fever), Dexamethasone (anti-inflammatory), Remdesivir (antiviral), along with Zinc and Vitamin C as supportive therapy.
- **Medical Equipment**: Oxygen cylinders, ventilators, PPE kits, and face masks.

- **Vaccines**: Depending on availability and regional approvals, vaccines such as Covishield, Covaxin, Pfizer, and Moderna were used.

Data Collection Tools

- Patient medical records
- Structured interviews or questionnaires for patients and healthcare professionals (if applicable)
- Epidemiological databases from WHO and national health authorities

Procedure for Nasal Spray Preparation Against COVID-19

Aseptic Setup

- All procedures were carried out in sterile environments such as a laminar airflow cabinet.
- Personnel wore sterile gloves, gowns, masks to maintain asepsis during preparation.

Example: Preparation of 0.5% Povidone-Iodine (PVP-I) Nasal Spray

1. **Dilution**:
   - 0.5 mL of 10% Povidone-Iodine was drawn into a sterile syringe and added to 9.5 mL of sterile normal saline.
   - This resulted in a 0.5% PVP-I solution, suitable for short-term nasal application.
2. **Mixing**:
   - The solution was mixed gently to ensure uniformity. Shaking was avoided to prevent foam formation.
3. **Filling**:
   - The mixture was transferred into sterile 10 mL nasal spray bottles.
   - Bottles were sealed, labeled with the concentration, preparation date, and expiry (typically 7 days under proper storage).
4. **Storage**:
   - Solutions were stored at room temperature or refrigerated (2–8°C).
   - They were protected from light and discarded after 7 days or if contamination was suspected

Preparation of Antiviral Nasal Spray (e.g., Iota-Carrageenan Based)

1. Active Ingredients Selection

- Iota-Carrageenan, Nitric Oxide donors, or Povidone-Iodine (low concentrations)
- Supportive ingredients like xylitol and isotonic saline may also be used.

2. Formulation Components

- **Iota-Carrageenan**: 0.12% w/v
- **Sodium Chloride**: 0.5% w/v (for isotonicity)
- **Purified Water**: Quantity sufficient to 100 mL
- **Buffering Agents**: Sodium phosphate monobasic and dibasic (pH 6.5–7.5)
- **Optional Additives**: Benzalkonium chloride (preservative), Glycerin (humectant)

3. Required Equipment

- Magnetic stirrer
- pH meter
- Volumetric flasks
- 0.22-micron sterile filtration unit
- Laminar flow hood
- Nasal spray bottles or unit-dose containers

4. Preparation Procedure

1. **Base Solution Preparation**:
   - Dissolve sodium chloride and buffering agents in purified water using a magnetic stirrer.
   - Gradually add Iota-Carrageenan under constant stirring. Gently heat if needed (not exceeding 40°C) for complete dispersion.
2. **pH Adjustment**:
   - pH was checked and adjusted between 6.5 to 7.5 using dilute HCl or NaOH.
3. **Addition of Additives**:
   - Preservatives and humectants were incorporated and mixed thoroughly.
4. **Sterile Filtration**:
   - The final solution was filtered through a 0.22-micron membrane under aseptic conditions.
5. **Filling and Packaging**:
   - The sterile formulation was filled into pre-sterilized spray bottles.
   - Each bottle was sealed and labeled with the batch number, manufacturing date, and expiry.

Quality Control Tests

- **Sterility Testing**: Ensures microbial contamination is absent.
- **pH Testing**: Confirms solution maintains proper nasal mucosa compatibility.
- **Viscosity Check**: Ensures ease of spray application.
- **Assay of Active Ingredients**: Validates correct concentration.
- **Microbial Limit Testing**: Confirms acceptable microbial content. **Methodology:**

A. Data Collection Procedure:

- Data was collected from hospital records, government health portals, and published research.
- Information on symptoms, test results, treatments administered, and patient outcomes were documented.

B. Inclusion Criteria:

- Patients confirmed as COVID-19 positive by RT-PCR.
- All age groups and genders were included.

C. Exclusion Criteria:

- Suspected cases without confirmatory test results.
- Patients with incomplete data records were excluded.

D. Data Analysis:

- Data was categorized based on age, gender, symptoms, types of tests, treatment methods, and patient outcomes.
- The results were presented using charts and tables.
- Comparisons were made between mild, moderate, and severe cases.

Observations and Results:

a. Clinical Presentation:

- **Common Symptoms:**
  - Fever, dry cough, fatigue
  - Shortness of breath, sore throat, loss of taste/smell
  - Headache, muscle pain, chills
- **Severe Cases:**
  - Pneumonia, ARDS (Acute Respiratory Distress Syndrome)
  - Thrombosis, multi-organ failure

b. Transmission:

- The virus is transmitted person-to-person via respiratory droplets and aerosols.
- Surface contact (fomite transmission) is less common.
- The incubation period ranges from 2 to 14 days, with an average of approximately 5 days.

c. Laboratory Findings:

- Decreased lymphocyte count (lymphopenia)
- Elevated CRP, D-dimer, ferritin levels (inflammation markers)
- Elevated liver enzymes in some patients
- Positive SARS-CoV-2 PCR or antigen test results

d. Imaging Findings:

- Chest X-rays or CT scans show bilateral ground-glass opacities and lung infiltrates.

Results:

a. Recovery:

- The majority of cases are mild to moderate and recover without hospitalization.
- Recovery time:
  - Mild cases: ~2 weeks
  - Severe cases: 3-6 weeks or longer

b. Complications:

- Pneumonia, ARDS, blood clots, stroke
- Long COVID (post-acute sequelae of SARS-CoV-2 infection)

c. Mortality:

- Mortality is higher among the elderly and those with comorbidities (e.g., diabetes, hypertension, heart disease).

d. Treatment Response:

- Mild cases: Symptomatic treatment (e.g., paracetamol, hydration)

CONCLUSION:

As widely recognized, there is currently no definitive cure for COVID-19, making it crucial to focus on preventing the spread of the virus. COVID-19 is an RNA virus that continues to threaten public health globally, causing widespread infections and fatalities. Key preventive measures include maintaining proper hand hygiene, practicing social distancing, and adhering to quarantine protocols.

Summary:

This study explores the clinical features, transmission, laboratory findings, and treatment outcomes of patients diagnosed with COVID-19. Data was collected from hospital records, government health portals, and published literature, focusing on patients confirmed positive by RT-PCR. Inclusion criteria consisted of individuals from all age groups and genders, while excluding suspected cases without confirmatory tests and those with incomplete records. The data was analyzed by categorizing patients based on demographics, symptoms, test types, treatments, and outcomes, with comparisons made between mild, moderate, and severe cases.

The most common symptoms reported were fever, dry cough, fatigue, sore throat, and loss of taste or smell, while severe cases manifested as pneumonia, ARDS, thrombosis, and multi-organ failure. The virus primarily spreads via respiratory droplets and aerosols, with an incubation period of 2-14 days. Laboratory tests showed lymphopenia, elevated inflammation markers, and positive PCR/antigen results, while chest imaging indicated bilateral ground-glass opacities.

Most patients with mild to moderate cases recovered without hospitalization. Complications such as pneumonia, ARDS, and blood clots were noted, with mortality higher in elderly patients or those with comorbidities. The study emphasizes the importance of preventive measures, including hand hygiene, social distancing, and quarantine, in controlling the spread of COVID-19.

REFERENCES:

1. Amutai, M. A. (2021). The coronavirus disease 2019 (COVID-19) outbreak: Challenges to pediatric dentistry. *Journal of Research in Medical and Dental Science*, *9*, 116–121.
2. Chan, J. F., Yuan, S., Kok, K. H., et al. (2020). A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: A study of a family cluster. *The Lancet*, *395*, 514–523. https://doi.org/10.1016/S0140-6736(20)30154-9
3. Chowdhury, S. D., & Oommen, A. M. (2020). Epidemiology of COVID-19. *Journal of Digestive Endoscopy*, *11*(1), 3–7.
4. Arons, M. M., Hatfield, K. M., Reddy, S. C., et al. (2020). Presymptomatic SARS-CoV-2 infections and transmission in a skilled nursing facility. *New England Journal of Medicine*, *382*, 2081–2090. https://doi.org/10.1056/NEJMoa2008457
5. Wang, D., Hu, B., Hu, C., et al. (2020). Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus–infected pneumonia in Wuhan, China. *JAMA*, *323*(11), 1061–1069. https://doi.org/10.1001/jama.2020.1585
6. World Health Organization. (2020). *Estimating mortality from COVID-19: Scientific brief*. https://www.who.int/publications/i/item/WHO-2019-nCoV-Sci_Brief-Mortality-2020.1
7. Ioannidis, J. P. A. (2021). Reconciling estimates of global spread and infection fatality rates of COVID-19: An overview of systematic evaluations. *European Journal of Clinical Investigation*, *51*(5), e13554. https://doi.org/10.1111/eci.13554
8. Linton, N. M., Kobayashi, T., & Yang, Y. (2020). Incubation period and other epidemiological characteristics of 2019 novel coronavirus infections with right truncation: A statistical analysis of publicly available case data. *Journal of Clinical Medicine*, *9*(2), 538. https://doi.org/10.3390/jcm9020538
9. Shkolnikov, V. M., Acosta, R. J., et al. (2021). Excess deaths associated with COVID-19 pandemic in 2020: Age and sex disaggregated time series analysis in 29 high-income countries. *BMJ*, *373*, n1137. https://doi.org/10.1136/bmj.n1137
10. Zhang, J., Litvinova, M., Wang, W., et al. (2020). Evolving epidemiology and transmission dynamics of coronavirus disease 2019 outside Hubei province, China: A descriptive and modelling study. *The Lancet Infectious Diseases*, *20*(7), 793–802. https://doi.org/10.1016/S1473-3099(20)30230-9
11. Cascella, M., Rajnik, M., Aleem, A., et al. (2021). Features, evaluation, and treatment of coronavirus (COVID-19). *StatPearls*. https://www.ncbi.nlm.nih.gov/books/NBK554776/
12. Güner, R., Hasanoglu, I., & Aktas, F. (2020). COVID-19: Prevention and control measures in the community. *Turkish Journal of Medical Sciences*, *50*(SI-1), 571–577. https://doi.org/10.3906/sag-2004-146
13. World Health Organization. (2020, December). *Mask use in the context of COVID-19: Interim guidance*. https://www.who.int/publications/i/item/WHO-2019-nCoV-IPC_Masks-2020.4
14. Graham, M. S., Sudre, C. H., May, A., et al. (2021). Changes in symptomatology, reinfection, and transmissibility associated with the SARS-CoV-2 variant B.1.1.7: An ecological study. *The Lancet Public Health*, *6*(5), e335–e345. https://doi.org/10.1016/S2468-2667(21)00055-4
15. World Health Organization. (2023, March). *Statement on SARS-CoV-2 variants of concern and interest*. https://www.who.int
16. Adjei, S., Hong, K., Molinari, N. M., et al. (2022). Mortality risk among patients hospitalized primarily for COVID-19 during the immunity and period of infectivity: United States, April 2020–June 2022. *MMWR. Morbidity and Mortality Weekly Report*, *71*(37), 1182–1189. https://doi.org/10.15585/mmwr.mm7137e2
17. Raj, U. (2020). Indian education system in fight against COVID-19 pandemic. *International Journal of Creative Research Thoughts (IJCRT)*, *8*, July Issue.
18. To, K. K. W., Tsang, O. T. Y., Leung, W. S., et al. (2020). Temporal profiles of viral load in posterior oropharyngeal saliva samples and serum antibody responses during infection by SARS-CoV-2: An observational cohort study. *The Lancet Infectious Diseases*, *20*(5), 565–574. https://doi.org/10.1016/S1473-3099(20)30196-1
19. Novavax. (2023). *Our Matrix-M™ adjuvant technology*. Retrieved October 23, 2023, from https://www.novavax.com/
20. World Health Organization Strategic Advisory Group of Experts on Immunization (SAGE). (2021). *Interim policy recommendations for the use of the Bharat Biotech BBV152 COVAXIN vaccine*.
21. Ministry of Health and Family Welfare. (2021, January 1). *Fact sheet for vaccine recipients and caregivers: Restricted use of Covaxin™ under clinical trial mode*.

https://cdsco.gov.in/opencms/export/sites/CDSCO_WEB/en/FactsheetofChAdSerum.pdf
22. World Health Organization. (2020). *Coronavirus disease (COVID-19) pandemic*. https://www.who.int/emergencies/diseases/novel-coronavirus-2019
23. Zhou, P., et al. (2020). A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature*, *579*, 270–273. https://doi.org/10.1038/s41586-020-2012-7
24. Guan, W. J., et al. (2020). Clinical characteristics of coronavirus disease 2019 in China. *New England Journal of Medicine*, *382*(18), 1708–1720. https://doi.org/10.1056/NEJMoa2002032
25. Corman, V. M., et al. (2020). Detection of 2019 novel coronavirus by RT-PCR. *Eurosurveillance*, *25*(3), 2000045. https://doi.org/10.2807/1560-7917.ES.2020.25.3.2000045
26. Beigel, J. H., et al. (2020). Remdesivir for the treatment of COVID-19. *New England Journal of Medicine*, *383*(19), 1813–1826. https://doi.org/10.1056/NEJMoa2007764
27. RECOVERY Collaborative Group. (2020). Dexamethasone in hospitalized patients with COVID-19. *New England Journal of Medicine*, *384*(8), 693–704. https://doi.org/10.1056/NEJMoa2021436
28. Polack, F. P., et al. (2020). Safety and efficacy of the BNT162b2 mRNA COVID-19 vaccine. *New England Journal of Medicine*, *383*(27), 2603–2615. https://doi.org/10.1056/NEJMoa2034577
29. Xiong, J., et al. (2020). Impact of COVID-19 pandemic on mental health in the general population: A systematic review. *Journal of Affective Disorders*, *277*, 55–64. https://doi.org/10.1016/j.jad.2020.08.001
30. Bambra, C., et al. (2020). The COVID-19 pandemic and health inequalities. *Journal of Epidemiology and Community Health*, *74*(11), 964–968. https://doi.org/10.1136/jech-2020-214401
31. National Institutes of Health. (2024). *COVID-19 treatment guidelines*. https://www.covid19treatmentguidelines.nih.gov/
32. RECOVERY Collaborative Group. (2021). Dexamethasone in hospitalized patients with COVID-19. *New England Journal of Medicine*, *384*(8), 693–704. https://doi.org/10.1056/NEJMoa2021436