

# A Review on Novel Coronavirus (COVID-19)

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**ABSTRACT - In 2019, an outbreak of coronavirus disease (COVID-19) caused by the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) raises an unparalleled challenge in the discovery of appropriate drugs for prevention and treatment. Given the rapid pace of scientific research and clinical data produced by the large number of people quickly infected with SARS-CoV-2, clinicians need reliable proof of successful medical care for this infection. The role of the Huanan seafood wholesale Market in propagating disease is unclear. Many initial COVID-19 was transmitted from animals to humans. In addition, the origin of COVID-19 has not been determined, and there is currently no clear antiviral treatment or vaccine. Based on the published evidence, this analysis systematically examines the etiology, epidemiology, clinical characteristics and current COVID-19-related intervention measures in the hope that it will provide a guide for future COVID-19 epidemic studies and help in the prevention and control. Hydroxychloroquine and chloroquine have received considerable interest as potential therapeutic agents against COVID-19 following many limited clinical trials, unregulated case series and public figure endorsements.**

**Keywords:** Coronavirus, pandemic, epidemiology, serological test, hydroxychloroquine.

## INTRODUCTION

A cluster of cases of unexplained viral pneumonia has been found in Wuhan, a metropolitan town in Hubei province, China, in December 2019 [1]. Initially, most of the confirmed cases were related to the Wuhan Huanan seafood market, where various types of live wild animals, including chickens, bats, groundhogs, and snakes, are sold. In symptomatology the Covid-19 is very similar to other viral respiratory infections. Cases range from moderate to extreme types which can lead to severe medical problems or even death [2]. Symptoms are believed that it appear in 2 to 14 days, although the incubation period for the novel coronavirus has not yet been confirmed. Unique modes of transmission are not understood, as it is novel virus. It originally originated as a source of animals but now spread from person to person [3]. There was speculation about the propagation of the virus when the carrier (infected person) shows no symptoms, but this was not verified as a scientific fact [4]. Coronaviruses (CoVs) most often cause mild disease; but have sometimes contributed to significant outbreaks of human disease in recent years. Mutations that cause structural changes in the coronavirus spike (S) glycoprotein usually require binding to new types of receptors and make the hop from an animal host to a human host (called "zoonotic" transmission) and may increase the risk of major outbreaks or epidemics. A novel CoV, the extreme acute respiratory virus (SARS), was discovered in the Chinese province of Guangdong in 2002. SARS is a zoonotic CoV that originated in bats and triggered symptoms in humans of recurrent fever, chills/rigor, myalgia, malaise, dry cough, headache and dyspnea. SARS had a mortality rate of 10% and was transmitted to 8000 people during an 8-month outbreak in 2002-2003 years after SARS, another novel, highly pathogenic CoV, known as middle east respiratory syndrome coronavirus (MERS-CoV), emerged and is also believed to have originated from bats, with camels as the reservoir host [5]. Formerly recognized only as the Wuhan virus, the Novel Corona Virus (Covid-19) widened its circle in South Korea, Japan, Italy, Iran and finally extended its routes towards India. It is given the novel name because it is a mutation of animal coronavirus that was never seen before. A provided cause of the outbreak is unknown as of now [6].

Coronaviruses in the Coronaviridae family belong to the subfamily Coronavirinae. Different forms of human coronaviruses differ in the degree to which the resulting disease is severe and how far it can spread. Doctors currently recognize types of coronavirus, namely 229E (alpha coronavirus), NL63 (alpha coronavirus), OC43 (beta coronavirus), and HKU1 (beta coronavirus), that can infect humans [7].

## Transmission

Viral particles are often present on the fingertips, excreted from the mouth and nose, and can be distributed to frequently touched objects such as laptops, glasses, faucets, and countertops. There are currently no reported cases of fomite-to-human transmission, but viral particles have been identified on abiotic BE surfaces. Previously, it has been reported that SARS can be transmitted by droplets, and is most commonly transmitted [8]. In view of the fact that SARS-CoV-2 ranges from a sister clade to the 2002 SARS virus, which is known to transmit from person to person, the high incidence of observed transmission from person to person, and the

rapid spread of COVID-19 across the world and populations, it is now recognized that SARS-CoV-2 can also be transmitted by droplets [9].

### Symptoms

Symptoms differ with COVID-19, from person to person. It can produce few symptoms or no. This can, however, also cause serious illness and may be fatal. Symptoms include fever, breathlessness, cough, and a person can experience symptoms after infection for 2-14 days [10].

### Epidemiology

Many cases of pneumonia clustered in Wuhan city were registered in December 2019, and source searches have identified Huanan Seafood Market as the sources [11]. The first case of the COVID-19 outbreak was reported on December 12, 2019 with unexplained pneumonia, and on December 31, 2019 27 cases of viral pneumonia with seven being serious were confirmed officially [12]. Etiological studies were carried out in patients who came to the hospital because of the viral history of these patients, which raised the probability of an infection transmitted from animals to humans. Novel CoV was reported to have originated from wild bats on January 22, 2020, and belonged to Group 2 of beta-coronavirus which contains Severe Acute Respiratory Syndrome Associated Coronavirus (SARS-CoV) [13]. While COVID-19 and SARS-CoV belong to the same subgroup of beta corona virus, genome-level overlap is only 70 percent, and the novel group has been shown to display genetic variations from SARS-CoV [14]. Similar to the SARS epidemic, this outbreak occurred during China's Spring Festival, which is China's most popular traditional festival, during which nearly 3 billion people. Such circumstances gave rise to favorable conditions for the transmission of this highly infectious disease and severe difficulties in epidemic prevention and control. The period of China's Spring Festival was from January 17 to February 23 in 2003, when the SARS epidemic peaked, while the festival date was from January 10 to February 18 in 2020 [15].

### Diagnosis Test

CoV epidemic is greater than previously thought and presents a problem for healthcare professionals including laboratories for diagnosis [16]. When the number of cases of CoV increases, public diagnostic laboratories are busy and spend more time in report generation (because of the lower number of public laboratories due to the CoV outbreak). During this time the CoV can expand further (as COVID-19 does not confirm the patient). So, we tried to put in the specific diagnostic tests that can confirm the CoV in serum samples and can be performed even in academic laboratories [17]. Laboratory check for viral contamination recognition (such as 19-CoV, MERS-CoV, and SARS-CoV2), is shown here. The laboratory studies usually come into two categories [18]

1. **Molecular test:** It is a diagnostic criterion for detecting active infection in individuals suspected of being infected, depending on the 19-CoV region of an outbreak.
  - a. rRT-PCR (Real-time reverse transcriptase- Polymerase chain reaction)
  - b. NAAT test (Nucleic acid amplification test) (Additional confirmation test)
  - c. Radiological computed tomography
2. **Serological test:** It contains two screening test
  - a. ELISA & CDC (Enzyme-Linked Immunosorbent Assay & Human cell division cycle)
  - b. One confirmatory test (micro-neutralization)

### Treatment

In the COVID-19 popular press Hydroxychloroquine and chloroquine were branded as possible "game-changers". Researchers have drawn on this information since the latest outbreak in 2019 to determine whether or not chloroquine will inhibit SARS-CoV-2 [19]. Yao et al. reported results of an antiviral assay earlier this March using the Vero cell lines infected with SARS-CoV-2 [20]. Hydroxychloroquine was found to be more active against SARS-CoV-2, in comparison to the above findings with SARS-CoV [21]. With a 48-hour EC50 of 0.72 $\mu$ M and 5.47 $\mu$ M respectively for hydroxychloroquine and chloroquine, hydroxychloroquine was more effective in impairing viral replication compared to chloroquine in post-infection [22]. Furthermore, when administered prophylactically, hydroxychloroquine was more effective than chloroquine in impairing SARS-CoV-2 viral replication; the EC50 for hydroxychloroquine and chloroquine was 5.85 $\mu$ M and 18.01 $\mu$ M, respectively [23-24].

### CONCLUSION

A lot of aspects of viral replication and pathogenesis will continue to be explored in future work on coronaviruses. First, knowing these viruses tendency to switch between organisms, create infection in a new host, and identifying significant coronavirus reservoirs can significantly assist in our ability to predict when and where potential epidemics may occur. Since bats tend to be an significant reservoir for these viruses, it will be fascinating to decide how they manage to escape clinically evident disease and persistently become infected. Additional research investigating hydroxychloroquine and chloroquine are urgently required in the prevention

and treatment of COVID-19. Given the limited evidence available, greater controlled trials are required to evaluate more closely if hydroxychloroquine/chloroquine in COVID-19 has a clinical advantage.

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