

COVID-19, Current Status Quo and What Lies Ahead

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Coronaviruses are the affiliates of the subfamily Coronavirinae in the family Coronaviridae and the order Nidovirales. The first incidence of the novel coronavirus with an outburst of uncommon viral pneumonia in China and then there was a pandemic outbreak of coronavirus in the form of 2019-nCoV or COVID-19 [1]. Coronaviruses are intricated in humans and vertebrate's ailments [2]. Coronaviruses are a hefty cluster of viruses that mainly distresses the upper respiratory infections such as sinusitis, laryngitis, tracheitis that causes pneumonia which may be symptomatic to fatal. SARS, MERS, and COVID-19 are the consequences of fatal contagion. The genomic structures and phylogenetic connexion between the Severe acute respiratory syndrome-related coronavirus or SARS-CoV and the COVID-19 led researchers to the conclusion that there is a similarity in the sequence of COVID-19 and SARSr-CoV and the virus uses ACE2 as the entry receptor-like SARSr-CoV-2 [3].

The scientific community has to develop an understanding of the genetic and phenotypic structure of COVID-19 in the pathogenesis to fabricate drug(s), and or vaccine(s). COVID-19 is a disease which came to human from bats to pangolin and then to humans. SARSr-CoV-2 is architecturally composed of a single-stranded RNA genome with four types of proteins such as S-spike proteins, E-envelope proteins, M-membrane proteins, and N-nucleocapsid proteins, with which they ascribe to the human cells and contaminate them [4]. The contagious COVID-19 is transmitted from human to human by droplet infection and touch [5].

Understanding the high rate of spread of the virus amid humans and its pandemic and to date, no explicit treatment is available for COVID-19, it is mandatory to identify the basis of its replication, structure, and pathogenicity for discovering a pathway for its treatment, and or prevention [1]. The number of confirmed COVID-19 cases have surpassed over nine million and the condition is expected to get worst, researchers across the globe are working hard to find the treatments and vaccines to lower the pandemic rate and minimize the mutilation caused by the virus [6].

Existing treatment strategies include the use of drugs that are by now permitted for other medical states or have been established on other diseases. Hydroxychloroquine and chloroquine received authorization from the Food and Drug Administration (FDA) for the treatment of COVID-19 under emergency conditions but later annulled their use for the treatment after certain research studies reported their ineffectiveness [7]. These drugs are still under clinical trials to render them effective against COVID-19. Researches are ongoing to find out drugs and vaccines to counter the disease which may take months or even longer, till then, we have to rely on social distancing, contact tracing, self-isolation, and other methods to safeguard humanity.

What lies ahead for the effective treatment of COVID-19, is the question of the moment now. New drug discovery takes a long-time to be available for the people as it goes through strict laboratory development to laboratory and animal testing to clinical trials on volunteers to actual people which might take a decade or even longer [8]. Therefore, existing medications can be the answer to the treatment of COVID-19 [9]. The scientist from the UK has identified three stages of the virus which can be monitored for its effective treatment. The first stage includes the step of keeping away the virus from entering into our cells, the second stage includes prevention of the replication

of the virus inside the cells and the third includes abating the mutilation instigated to the organs by the virus. Mostly antiviral drugs have found applicability for the treatment of COVID-19. These should be administered before the virus start multiplying inside the cells or it causes damage to organs such as lungs or other tissues [10].

Antiviral drugs such as Remdesivir, in a research study on MERS, have been shown to block the replication of the coronavirus, though it failed in the clinical trial stage against *Ebola* in 2014 [10]. Remdesivir is under testing in many COVID-19 clinical trials across the globe along with many other drugs in combination. In one of the trials, people who were given Remdesivir recovered from COVID-19 in 11 days in comparison to people who didn't take the drug. The actual outcome of the study is awaited to be published. Another study reported no effect of the drug compared to the people who were administered a placebo [11]. Instead of these conflicting outcomes, the FDA accepted the emergency use of remdesivir. Arbidol, lopinavir/ritonavir have been tested as a treatment for COVID-19 though the results were not promising [12]. EIDD-2801 has been reported to reduce replication of multiple coronaviruses, including SARS-CoV-2, and is under clinical trials in the United Kingdom.

Favipiravir used to treat influenza, have been tested for the treatment for COVID-19 in China, though the results have not been published yet [13]. Kaletra, a combination of two drugs: lopinavir and ritonavir, which is used for the treatment of HIV are under testing against SARs-COV-2 [14]. Merimepodib (VX-497), developed by ViralClear Pharmaceuticals Inc. is under trials given in combination with remdesivir [15].

Other treatments embrace use of ibuprofen. Clinical trial over COVID-19 patients is underway with a thought that the drug could affluence up breathing complications related to the disease [16]. The use of protein and antibodies is also reported [17,18]. Research studies at Yale University are being carried out on apilimod which is reported that can block cellular entry of the virus that causes COVID-19. The drug has been assigned a fast track status by the FDA [19].

Sorrento Therapeutics announced that their laboratory has tailored a monoclonal antibody that can trigger the immunes system to target the coronavirus [20]. Plasma therapy includes the treatment of patients with the blood plasma of the people who have recovered from COVID-19 [21].

What future awaits, is still a query as no pharmaceutical firm has offered a timeline for the availability of drugs and/or vaccines for the treatment of COVID-19. Vaccines could be the answer to protect people when they are exposed to a virus, say to the new SARS-CoV-2. Recently, Russia reported that all 76 volunteers in a clinical trial developed antibodies to COVID-19 after being immunized [22]. Moderna, Inovio, the University of Oxford in collaboration with AstraZeneca, University of Queensland, Johnson and Johnson, and Sanofi are few institutions which are in various clinical trial phases of developing vaccines against COVID-19 [6].

In conclusion, the scientific community and the common people have to combat SARS-CoV-2 together in harmony, using safety masks, sanitizers, maintaining social distancing, and considering socio-economic factors till, the final treatment arrives.

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