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REVIEW ARTICLE **OPEN ACCESS**

The Novel Coronavirus Disease 2019 (Covid-19): A Review

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ABSTRACT

Corona viruses belong to the genus Coronavirus in the Coronaviridae. Coronaviruses are a group of highly diverse, enclosed, positive-sense, and single-stranded RNA viruses. They cause several diseases including respiratory, enteric, hepatic, and neurological systems with vary harshness among humans and animals. In December 2019, novel Coronavirus (nCoV), which is additional public health problem, has occurred in the Huanan Seafood Market, where livestock animals are also traded, in Wuhan State of Hubei Province in China and has been the attention of worldwide due to a pneumonia epidemic of unknown cause. This virus was named as COVID-19 by WHO.This review focus on Sources, Modes of Transmission, Pathogen, Epidemiology, clinical features, diagnosis, Prevention Control &Treatment of Coronavirus.

Key words: *Corona virus, COVID-19, SARS, MERS, WHO, Epidemic.*

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INTRODUCTION

Coronaviruses belong to the subfamily Orthocoronavirinae in the family of Coronaviridae in the order Nidovirales, and this subfamily including α-coronavirus, β-coronavirus, γ-coronavirus, and delta-coronavirus.COVID-19 was more than 82%identical to those of SARS-CoV. COVID-19 may extentinternational with the epidemic. Presently, there is no registered treatment or vac-cine for the disease. In the lack of a specific treatment for this novel virus, there is an crucial need to find an substitute solution to prevent and control the duplication and spread of the virus [7].September 2012 saying the documentation of a novel human coronavirus, now known as Middle East respiratory syndrome coronavirus (MERS-CoV) [1].Coronaviruses belong to the genus Coronavirus in the Coronaviridae. All CoVs are pleomorphic RNA viruses characteristically containing crown shape peplomers with 80-160 nM in size and 27-32 kb positive polarity. Recombination rates of CoVs are very high because of continuously developing transcription errors and RNA Dependent RNA Polymerase jumps. With its high mutation rate, Coronaviruses are zoonotic pathogens that are present in humans and various animals with a wide range of clinical features from asymptomatic course to requirement of hospitalization in the intensive care unit; causing infections in respiratory, gastrointestinal, hepatic and neurologic systems. They were not considered as highly pathogenic for humans till they have been seen with the severe acute respiratory syndrome in the Guangdong state of China for the first time in 2002 and 2003. Before these epidemics, there were the two most known types of CoV as CoV OC43 and CoV 229E that have generally caused mild infections in people with an adequate immune system. Nearly ten years after SARS this time, another highly pathogenic CoV, Middle East Respiratory Syndrome Coronavirus has occurred in the Middle East

countries. In December 2019, 2019 novel Coronavirus (nCoV), which is additional public health problem, has occurred in the Wuhan Seafood Market, where livestock animals are also traded, in Wuhan State of Hubei Province in China and has been the attention of worldwide attention due to a pneumonia epidemic of unknown cause. At first, an unknown pneumonia case was detected on December 12, 2019, and possible influenza and further coronaviruses were ruled out by laboratory testing. Chinese authorities announced on January 7, 2020 that a new type of Coronavirus was isolated.This virus was named as COVID-19 by WHO on January 12 and COVID-19 on 11 February 2020. As of February 12, 2020, a total of 43.103 confirmed cases and 1.018 deaths have been announced.When given where the first case originated, the infection were transmitted probably as zoonotic agent. The growth in the number of cases in Wuhan city and internationally after closing the market and evacuation of the cases in China has shown a second transmission from human-to-human. New cases are identified, principally in other Asian countries and in many countries such as the trans-oceanic USA and France the objective of this review article was to have a preliminary opinion about the disease, the ways of treatment, and prevention in this early stage of this outbreak [2]. As of date (30 January 2020), 7734 cases have been confirmed in China, and 90 cases have also been cumulatively reported from Taiwan, Thailand, Vietnam, Malaysia, Nepal, Sri Lanka, Cambodia, Japan, Singapore, Republic of Korea, United Arab Emirate, United States, The Philippines, India, Australia, Canada, Finland, France and Germany (Finland, France and Germany are the only European countries in which cases [n = 1, n = 5, and n = 4, respectively] have been reported up to date). According to the released news, the case rate fatality is 2.2% (170/7824) [4].Based on the first reported flow of cases in Wuhan, the majority were males with a median age of 55 years and linked to the Huanan Seafood Wholesale Market . Most of the reported cases had similar symptoms at the onset of illness such as fever, cough, and myalgia or fatigue. Maximum cases developed pneumonia and some severe and even fatal respiratory diseases such as acute respiratory distress syndrome[5].The causative virus has been provisionally named as severe acute respiratory syndrome Coronavirus 2 (SARS-CoV-2) and the relevant infected disease has been named as Coronavirus disease2019 (COVID-19) by the World Health Organization, correspondingly. According to the daily report of the World Health Organization, the epidemic of SARS-CoV-2 so far registered 78630 cases and 2747deaths in China, spread to 46 other countries that reported a total of 3664 cases by 27 February 2020 COVID-19 epidemic has become a global health threat.

Coronaviruses are a group of highly diverse, enclosed, positive-sense, and single-stranded RNA viruses. They cause several diseases including respiratory, enteric, hepatic, and neurological systems with vary harshness among humans and animals. Human CoV infections have usually caused a low percentage of annual respiratory infections. There are HCoV-OC43, HCoV-229E, HCoV-NL63, and HCoV-HKU1, which cause mild respiratory illness. The main symptoms of COVID-19 included fever, fatigue, and cough, which are parallel to that of SARS-CoV and MERS-CoV infected cases [6].At present-day, real-time reverse-transcription–polymerase-chain-reaction (RT-PCR) assay for COVID-19 has been developed and used in clinics. Radiological examinations, particularly thin slice chest CT, play an important role in fighting this infectious disease. Chest CT can identify the early phase lung infection and quick larger public health surveillance and response systems. Presently, chest CT findings have been suggested as major evidence for confirmed clinical diagnosis in Hubei, China. The addition of chest CT for diagnosis resulted in 14840 confirmed new cases (13332 clinically diagnosed cases) reported on February 13, 2020. Broad and timely review of radiological role in fighting COVID-19 remains urgent and mandatory [8].COVID-19 has denoted a high negative impact on the economy of China as well as a few other nations [11].

SOURCES & MODES OF TRANSMISSION

This is a huge family of viruses that are common in many different animal species, including camels, cattle, cats, and bats. Rarely, animal CoVs can infect humans and, as a result, may spread among humans during epidemics such as MERS, SARS, and COVID-19. In latest studies, it has been observed that the novel virus causing epidemics concurs with the CoV isolated in bats. Presence of wild animal trade in WuhanSeafood Market where the first cases appeared supports this finding. Definite new reports from many infected healthcare workers in Wuhan show that human-to-human transmission can happen. As in SARS and MERS epidemics in the past, human-to-human transmission has quicker the spread of the epidemic and case reports have also started from other states of China. The first non-Chinese case of the infection, which spread to the Chinese provinces, and then to the Asian continent, was reported from Thailand on January 13, 2020. The case reported being a Chinese tourist who has traveled to Thailand and had no epidemiologic connection with the marketplace. The human-to-human transmission occurs with close contact. The transmission primarily occurs when an infected person sneezes and through the respiratory droplets produced just as the spread of influenza and other respiratory pathogens. These droplets can settle in the mouth or nasal mucosa and lungs of people with inhaled air. Now, it remains

unclear whether a person can be infected by CO-VID-19 by touching an infected surface or object and then touching their mouth, nose, or possibly eyes [2].

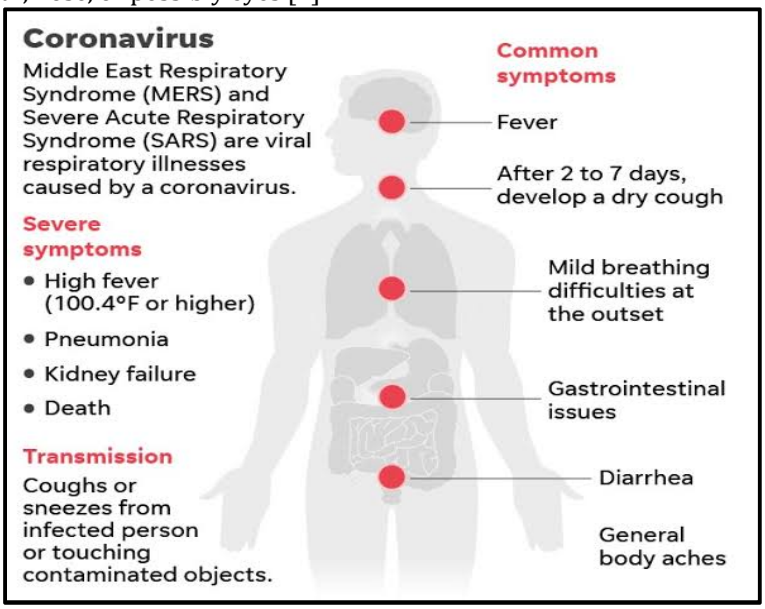

Figure 1: Severe and common symptoms of coronavirus

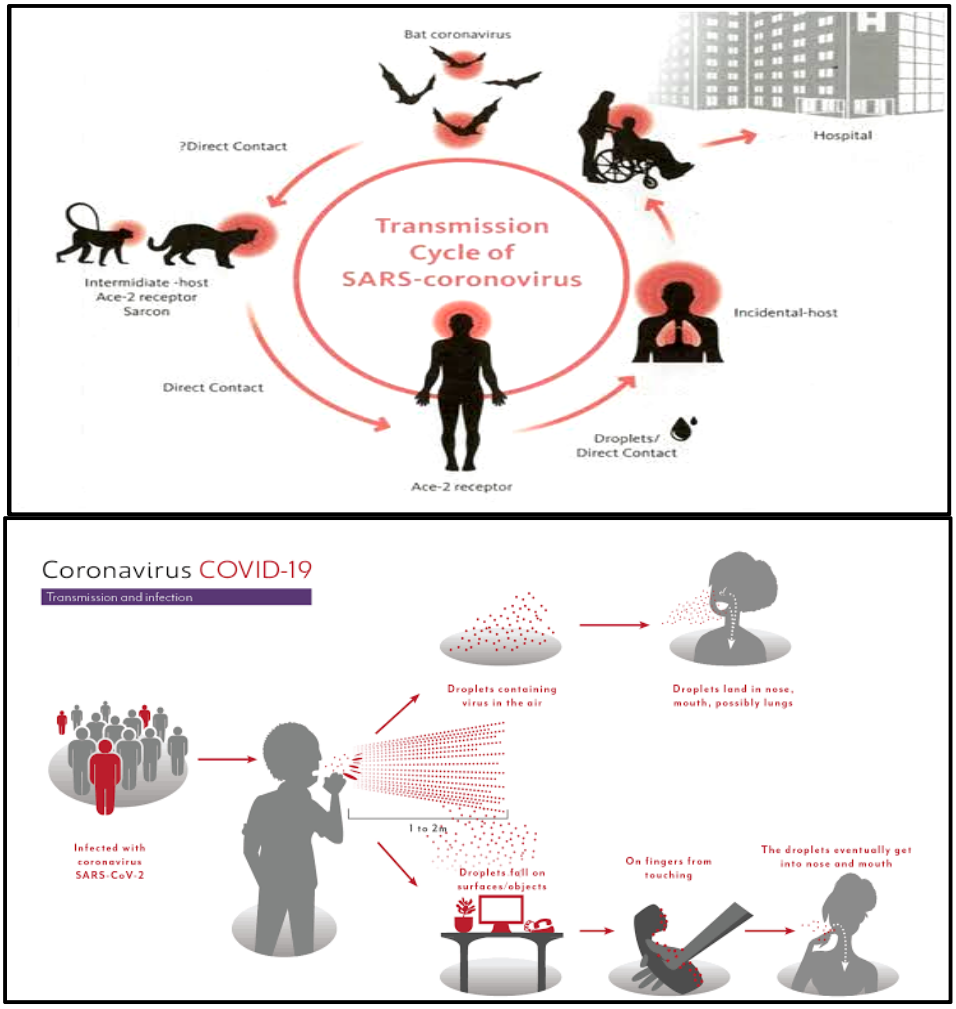

Figure 2: Modes of Transmission coronavirus and its cycle.

THE PATHOGEN

The pathogen that causes COVID-19 is an CoV that was first known in the late January 2020, named SARS-CoV-2. SARS-CoV-2 is a novel member of CoVs, which are a large group of highly diverse, enveloped, positive-sense, and single-stranded RNA viruses. Current research reported that SARS-CoV-2 likely originated in bats, based on the similarity of its genetic sequence to that of other CoVs.(Figure 1) S protein binds to the cellular receptor ACE2 to facilitate the entry of the virus. After the fusion of viral and plasma membranes, virus RNA undergoes replication and transcription. The proteins are synthesized. Viral proteins and new RNA genome are subsequently assembled in the ER and Golgi, followed by budding into the lumen of the ERGIC. New virions are released through vesicles. [6].

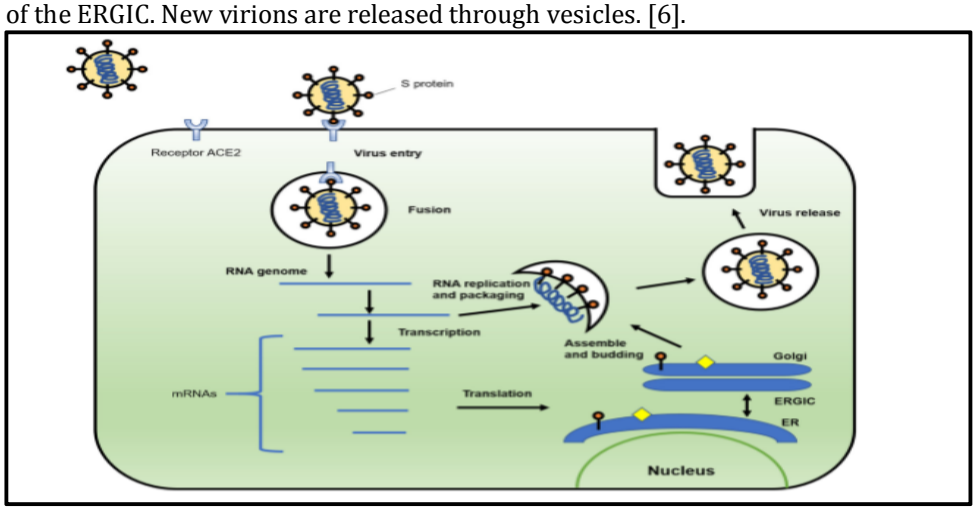

Figure 3: Schematic model of SARS-CoV-2 life cycle. [6]

EPIDEMIOLOGY

The first case of the COVID-19 epidemic was exposed with unsolved pneumonia on December 12, 2019, and 27 viral pneumonia cases with seven being severe, were officially announced on December 31, 2019.On January 2, 2020, novel CoV has been declared to be originated from wild bats and belonged to Group 2 of beta-Coronavirus that contains Severe Acute Respiratory Syndrome Associated Coronavirus .WhileCOVID-19 and SARS-CoV belong to the same beta Coronavirus subgroup, parallel at genome level is only 70%, and the novel group has been found to show genetic differences from SARS-CoV. Parallel to the SARS epidemic, this epidemic has occurred during the Spring Festival in China, which is the most celebrated traditional festival in China, during which nearly 3 billion people travel countrywide. These conditions caused auspicious conditions for the transmission of this highly transmissible disease and severe difficulties in prevention and control of the epidemic. The period of the Spring Festival of China was between January 17 and February 23 in 2003, when the SARS epidemic peaked, while the period of the festival was between January 10 and February 18 in 2020. Likewise, there was a rapid increase in COVID-19 cases between January 10-22. Wuhan, the center of the epidemic with 10 million populations, is also an important center in the spring festival transportation network. The projected number of travelers during the 2020 spring festival has increased 1.7 folds when compared with the number traveled in 2003 and reached to 3.11 billion from 1.82 billion. This large scale travel traffic has also created favorable conditions for the spread of this difficult to control disease [2].

Till June 20, 2020, the number of worldwide fatalities raises upto 500,000, according to statistics from Johns Hopkins University. It is around six months since the first reports emerged of a pneumonia outbreak of unknown cause in Wuhan, China. There have been 125,700 fatalities in the United States and 57,000 in Brazil, and these two countries account for more than a third of the overall total.

There are indication suggest that transmission mode is human to human. The major route of transmission of COVID-19 is droplet and close contact. Whether infection can occur through the oral or conjunctival routes is unknown, but SARS-CoV-2 has been detected in tears, which is resembled to SARS-CoV. Reproductive number (R0) was estimated by some studies. On the basis of clinical data of patients in COVID-19 early outbreak, the mean R0 was ranging from 2.20 to 3.58, meaning that each patient has been spreading infection to two or three other people. It is still too early to develop an accurate R0 estimate or to assess the dynamics of transmission. More research is needed in the future. The mean incubation period is about 5 days, ranging from 1 to 14days and 95% of patients are likely to experience symptoms within 12.5 days of contact. These data suggest a 14-day medical observation period or quarantine for exposed and close contact persons. However, an asymptomatic carrier was reported and the incubation period was 19 days, suggesting the complicated challenge to contain the epidemic [6].

CLINICAL FEATURES

Maximum case patients were 30 to 79 years of age. The median age is ranging from 49 to 59 years. There were few cases in children below 15 years of age. More than half the patients were male. Nearly half the cases had one or more coexisting medical conditions, such as hypertension, diabetes, and cardiovascular disease. A large cases study indicated that the case fatality rate was elevated among those patients with coexisting medical conditions.

The main symptoms include a self-reported fever, fatigue, dry cough, myalgia, and dyspnea. The uncommon symptoms include sputum production, headache, hemoptysis, and diarrhea. Although pneumonia is present in most SARS-CoV-2 infected patients, few cases complained of pleuritic chest pain. According to the severity of symptoms, patients can be classified as mild, severe, and critical types (Table 1) [6].

Table 1: Clinical symptoms associated with COVID-19

Clinical types	Symptoms
Mild type	Nonpneumonia or mild pneumonia
Severe type	Dyspnea, respiratory frequency≥30/min, blood oxygen saturation≤93%, partial pressure of arterial oxygen to fraction of inspired oxygen ratio<300, and/or lung infiltrates>50% within 24/48h
Critical type	Respiratory failure, septic shock, and/or multiple organ dysfunction or failure

CLINICAL PROGRESSION-DIAGNOSIS

The first death due to coronaviruses has reported by the isolation of SARS-CoV from a patient with pneumonia in China. Similar to SARS CoV and MERS CoV that caused epidemics in the past years, the first symptoms are commonly defined as fever, cough, and shortness of breath. Although diarrhea was present in about 20-25% of patients with MERS-CoV or SARS-CoV infection, intestinal symptoms were rarely reported in patients with COVID-19. In another study of 99 patients, chest pain, confusion, and nausea vomiting were noted in addition to previous findings. On X-rays or thorax CT imaging of the examined patients, individual or two-sided involvement compatible with viral pneumonia was found and two-sided multiple lobular and sub segmental consolidation areas were observed in patients hospitalized in the intensive care unit. As in SARS and MERS, the diagnosis of 2019 n-CoV infection is based on a history of detailed contact and travel, and precise laboratory testing. The diagnostic tools are molecular methods, serology and viral culture. The most common diagnostic methods are molecular methods as RT-PCR (reverse transcription) or real-time PCR, which are made using RNA from respiratory samples such as oropharyngeal swabs, sputum, nasopharyngeal aspirate, deep tracheal aspirate, or bronchoalveolar lavage. In particular, lower respiratory tract samples can offer significantly higher viral load and genome fraction than upper respiratory tract samples. These techniques are beneficial in terms of evaluating the results quickly, showing the genome structure and viral load [2].

CORONAVIRUS FROM SARS TO MERS

SARS-CoV, which coined from China and then was spread to other parts of the world with hospital acquired infectious cases, had a mortality rate of 10%, and was transmitted to 8000 people during an 8-month outbreak in 2002-2003. In 2012, MERS-CoV, when it emerged in Arabian Peninsula MERS-CoV, spread to 27 countries with 35.6% mortality rate in 2220 cases. It is known that both of them are zoonotic viruses showing hospital-acquired and human-to-human transmission. Similar dynamics apply for COVID-19 that was initiated from Wuhan and the current the rate of mortality from this infection is about 2%. CoVs can use different receptors and pathways when entering the cell. SARS-CoV usually infects young people, MERS-CoV people aged above 50 years and COVID-19 infects middle age and above. Comparing non-respiratory complications, MERS-CoV involve the cardiovascular system more frequently than SARS-CoV and frequently require vasopressor treatment. Case series have reported that COVID-19 affects the cardiovascular system. There are no studies that report a definitely successful drug for their treatment. In terms of epidemic periods, SARS-CoV ended in less than a year, and the MERS-CoV epidemic lasted for seven years despite its spread to more restricted areas and. The question of how long the novel COVID-19 outbreak will last is a question that everyone is curious about [2].

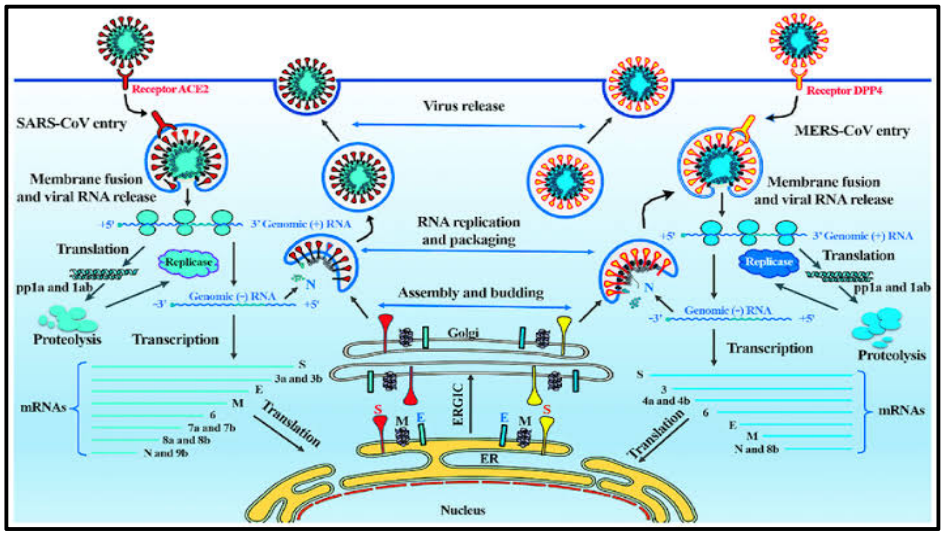

Figure 4: The life cycle of SARS-CoV and MERS-CoV in host cells. [11]

THE CORONAVIRUS STRUCTURE AND HOST

CoVs belong to the subfamily Coronavirinae, in the family Coronaviridae of the order Nidovirales. CoVs have four known genera: Alpha coronavirus, Beta coronavirus, Gamma coronavirus, and Delta coronavirus. The CoV name is a derivative from the Latin word corona which means crown. This is due to the characteristic structure of the virus whereby a surface projection on the viral envelope gives it an appearance similar to a crown. The virus is a single-stranded positive-sense RNA virus with a genome of around 30 kb in length. This makes them the largest known RNA viruses. The RNA genome codes for both structural proteins (SPs) and non-structural proteins (NSPs). All identified CoVs share a similar structure made of four main structural proteins: spike (S), membrane (M), envelope (E), and nucleocapsid (N) proteins. Some CoVs also encode special structural and accessory proteins. While the exact functions of most addition proteins are still currently being researched on, it is predictable that the structural proteins aid the viral infection of host cells and subsequent replication. The S-protein is responsible for attachment to host receptors, M protein helps shape the virion particles and binding to nucleocapsid, E-protein plays a role in the assembly and release of particles while N-protein aids with the binding of the genome to a replication transcription complex which is required for the replication of genomic material[10].

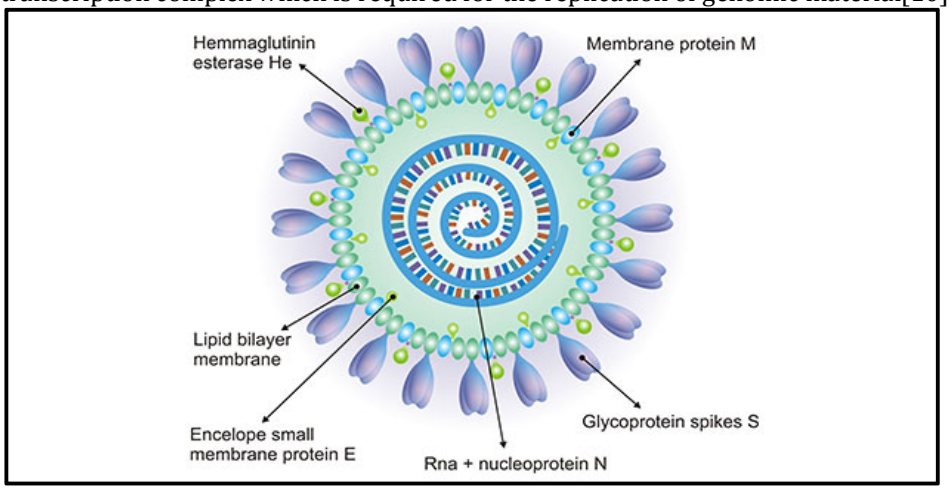

Figure 5: Typical structure of coronavirus

DIAGNOSIS

Real time-polymerase chain reaction (RT-PCR) is regularly used to detect causative viruses from respiratory secretions. During COVID-19 transmission events, RT-PCR has served as the primary clinical laboratory diagnostic test. Successes of these tests are very important to understand the viral kinetics and tissue tropism found in COVID-19 cases. Several specific and sensitive assays targeting RdRP, N, and E genes of the SARS-CoV-2 genome were designed to detect viral RNA in clinical specimens. Lower respiratory tract samples provide the higher viral loads. The sampling source or operation may affect

RT-PCR testing results. The positive rate of RT-PCR for throat swab samples was reported to be about 60% in early stage of COVID-19. These findings suggested that the result of RT-PCR should be interpreted with caution. For rapid diagnosis of SARS-CoV-2, molecular tools are widely preferred. Serological diagnosis is not of much help at the peak of the epidemic, though serum samples of recovered patients can be tested to know the titer of IgG. In severely infected patients, computed tomography technique (CT) and X-Ray can be of help to observe the lesions of pulmonary pneumonia in the lungs in correlation with clinical symptoms to depict the picture of COVID-19[11].

PREVENTION AND CONTROL

It is recommended to share alertness programs through social networking sites and platforms and follow intense epidemiological surveillance so that any new case of COVID-19 can be notified to WHO.The governments should cheer travelers to postpone their tours to avoid exposure to COVID-19 affected countries and those who are returning back from affected countries must be isolated and quarantined for health check-ups and evaluation of their health status. People should wash their hands with soap-water or prefer to use sanitizers, should remain inside home, should chorus from crowded places and avoid contacts with live dead animals especially wild animals, children, and older adults must take precautions as they are more disposed to the severe respiratory distress syndrome of COVID-19. If people presents respiratory symptoms should wear face mask in order to avoid further transmission to other susceptible people. China has forced a temporary ban on the sale of wild animals in Wuhan animal market and planning to forbid the wildlife trading permanently [11].

TREATMENT & PROTECTION

According to a human MERS-CoV case report from South Korea, the use of the combination of Lopinavir/Ritonavir (LPV/RTV) (Anti-HIV drugs), pegylated interferon and ribavirin provided a successful viral clearance. While another antiviral drug, remdesivir was used in the first case reported from the United States of America, looked successful, controlled studies with more cases are needed. Many trials should be taken, such as timely publication of epidemic information for elimination of the source of infection, initial diagnosis, reporting, isolation, and supportive treatments and for avoiding unnecessary panic. Based on the 2003 SARS-CoV epidemic experience, the Chinese government takes many effective measures including closing public transport, reducing migration and encouraging personal protection with masks in Wuhan and other provinces. Hence, there are reported cases of infected hospital personnel, healthcare staff should be informed about taking personal protective measures such as the use of gloves, eye masks and N95 masks during the examination of patients with a suspected history of COVID-19 contact or travel to China[2].The core treatment of COVID-19 is symptomatic treatment. The antiviral drugs, including oseltamivir, ribavirin, ganciclovir, lopinavir, and ritonavir have been used in attempts to decrease viral load and to prevent the probability of respiratory complications in several studies. Remdesivir was reported in the treatment of a patient with COVID-19 in the United States and got an effective result. However, the efficacy of these antiviral drugs for COVID-19 needs to be verified by randomized-controlled clinical trials. Arbidol is used empirically in China because of its direct antiviral effect on SARS-CoV in cell culture. Chinese herbal medicine formulae are used to prevent SARS-CoV-2 infection in 23 provinces in China. [6].

GENERAL TREATMENT FOR VIRAL INFECTION

Nutritional interventions

Table 2: General supportive treatments

Options	**Virus targeted and functions related**
Nutritional interventions	
Vitamin A	Measles virus, human immunodeficiency virus, avian coronavirus
B vitamins	MERS-CoV; ventilator-induced lung injury
Vitamin C	Avian coronavirus; lower respiratory tract infections
Vitamin D	Bovine coronavirus
Vitamin E	Coxsackievirus, bovine coronavirus
Omega-3 polyunsaturated fatty acids (PUFA)	Influenza virus, human immunodeficiency virus
Selenium	Influenza virus, avian coronavirus; viral mutations
Zinc	Measles virus, SARS-CoV
Iron	Viral mutations
Immuno-enhancers	
Interferons	SARS-CoV, MERS-CoV

Intravenous gammaglobulin	SARS-CoV
Thymosin α-1	Increase resistance to glucocorticoid-induced death of thymocyte
Thymopentin	Restore antibody production
Levamisole	Immunostimulant agent or immunosuppressive agent
Cyclosporine A	SARS-CoV, avian infectious bronchitis virus
Chinese medicine	SARS-CoV, avian infectious bronchitis virus

CORONAVIRUS-SPECIFIC TREATMENT

No pharmaceutical products have yet been shown to be safe and effective for the treatment of COVID-19. However, a number of medicines have been suggested as potential investigational therapies, many of which are now being or will soon be studied in clinical trials, including the SOLIDARITY trial co-sponsored by WHO and participating countries. When a disease is new, there is no vaccine until one is developed. It can take a number of years for a new vaccine to be developed.

Coronaviral protease inhibitors

Chymotrypsin-like and papain-like protease are Coronavirus encoded proteins. They have a vital function for coronaviral replication and also have additional function for inhibition of host innate immune responses. Targeting 3C-like protease and papain-like protease are more attractive for the treatment of Coronavirus.

Chymotrypsin-like (3C-like) inhibitors

Cinanserin

Cinanserin, an ancient drug, is well-known for serotonin receptor antagonist. It could inhibit the 3 chymotrypsin-like protease and was auspicious inhibitor of replication of SARS-CoV.The 3CLpro was also been originate to be encoded in COVID-19.Therefore;Cinanserin may be a better choice for the treatment of COVID-19 infection.

Flavonoids

Flavonoids are an significant class of natural products and have numerous subgroups, which include chalcones, flavones, flavonols, and isoflavones. Flavonoids have several functions besides antioxidant effects and they also have antiviral abilities. Anti-coronavirus activity of some flavonoids (Herbacetin, rhoifolin and pectolinarin) was due to the inhibition of 3C-like protease.

Papain-like protease inhibitors

Papain-like protease of human Coronavirus is a novel viral-encoded deubiquitinase and is an IFN antagonist for inhibition ofhost innate antiviral immune response.

Diarylheptanoids

Diarylheptanoids is a natural product and is extracted from the stem bark of Alnus japonica. It had been found to be able to inhibit papain- like protease of SARS-CoV. Therefore, cinanserin together with flavonoids and other natural compounds could be chosen as alternative choices to fight COVID-19 infection through targeting coronaviral proteases.

Spike (S) protein-angiotensin-convertingenzyme-2 (ACE2) blockers

Angiotensin-converting enzyme-2 (ACE2) is a type I integral membrane protein which functions as a carboxypeptidase and is the first human homolog of ACE. ACE2 efficiently hydrolyzes the potent vasoconstrictor angiotensin II to angiotensin (1-7) and it has been implicated in hypertension, cardiac function, heart function, and diabetes. In addition, ACE2 is also a functional receptor of SARS-CoV and it mediates virus entry into the cell through binding with spike (S) protein.

Human monoclonal antibody

The mAb could powerfully neutralize SARS-CoVand inhibit syncytia formation between cells expressing the S protein and those expressing the SARS-CoV receptor ACE2.

Chloroquine

Chloroquine is a 9-aminoquinoline known since 1934. Apart from its well-famous antimalarial effects, the drug also has many interesting biochemical properties including antiviral effect. In addition, it had been used against viral infection. Moreover, chloroquine was also found to be a potent inhibitor of SARS Coronavirus infection through interfering with ACE2, one of cell surface binding sites for S protein of SARS-CoV.

Emodin

Emodin is an anthraquinone compound derived from genus Rheum and Polygonum and it is also a virucidal agent. Emodin could significantly block the interaction between the S proteins of SARS-CoV and ACE2. Therefore, emodin might abolish SARS-CoV infection bycompeting for the binding site of S protein with ACE2.

Promazine

Promazine, anti-psychotic drug, shares a similar structure with emodin. It has been found to exhibit a significant effect in inhibiting the replication of SARS-CoV. As compared to emodin, promazine exhibited potent inhibition of the binding of S protein to ACE2. These findings suggested that emodin and promazine might be able to in-hibit SARS-CoV infectivity through blocking the interaction of S protein and ACE2. Therefore, the monoclonal antibody, chloroquine, emodin, and promazine could be used as alternative choices for the treatment of COVID-19.

Nicotianamine

Nicotianamine is an important metal ligand in plants and it is originate novel angiotensin-converting enzyme-2 inhibitor in soybean. So, it is another potential option to be used to reduce the infection of COVID-19.

ANTIVIRAL TREATMENTS OTHER COMPOUNDS

Antiviral treatments

Ribavirin
Lopinavir (LPV)/ritonavir (RTV) (Kaletra)
Remdesivir
Nelfinavir
Arbidol
Nitric oxide

Other compounds

α-Lipoic acid
Estradiol and phytoestrogen
Mucroporin-M1 [7].

FACTS ABOUT COVID-19

What is COVID-19?

COVID-19 is a disease caused by a new strain of Coronavirus. 'CO' stands for corona, 'VI' for virus, and 'D' for disease. Formerly, this disease was referred to as '2019 novel Coronavirus' or '2019-nCoV.'The COVID-19 virus is a new virus linked to the same family of viruses as Severe Acute Respiratory Syndrome and some types of common cold.

What are the symptoms of COVID-19?

Symptoms can include fever, cough and shortness of breath. In more severe cases, infection can cause pneumonia or breathing difficulties. More rarely, the disease can be fatal. These symptoms are similar to the flu (influenza) or the common cold, which are a lot more common than COVID-19. This is why testing is required to confirm if someone has COVID-19.

How does COVID-19 spread?

The virus is transmitted through direct contact with respiratory droplets of an infected person (generated through coughing and sneezing). Individuals can also be infected from and touching surfaces contaminated with the virus and touching their face (e.g., eyes, nose, and mouth). The COVID-19 virus may survive on surfaces for several hours, but simple disinfectants can kill it.

Who is most at risk?

We are learning more about how COVID-19 affects peopleevery day. Older people, and people with chronic medical conditions, such as diabetes and heart disease, appear to be more at risk of developing severe symptoms. As thisis a new virus, we are still learning about how it affects children. We know it is possible for people of any age to be infected with the virus, but so far there are relatively few cases of COVID-19 reported among children. This is a new virus and we need to learn more about how it affects children. The virus can be fatal in rare cases, so far mainly among older people with pre-existing medical conditions.

What is the treatment for COVID-19?

There is no currently available vaccine for COVID-19. However, many of the symptoms can be treated and getting early care from a healthcare provider can make the disease less dangerous. There are several clinical trials that are being conducted to evaluate potential therapeutics for COVID-19.

How can the spread of COVID-19 be slowed down or prevented?

As with other respiratory infections like the flu or the common cold, public health measures are critical to slow the spread of illnesses. Public health measures are everyday preventive actions that include:

a) Staying home when sick;
b) Covering mouth and nose with flexed elbow or tissue when coughing or

c) Sneezing. Dispose of used tissue immediately;
d) Washing hands often with soap and water; and
e) Cleaning frequently touched surfaces and objects.
As we learn more about COVID-19 public health officials may recommend additional actions[3].

CONCLUSION

This review concludes that:
1) At the moment, there is no vaccine and no specific treatment for COVID-19.
2)The best plan to deal with SARS-CoV-2 epidemic includes controlling the sources of infection, protecting the susceptible people, and cutting off the transmission.
3)The infected patients should be identified early by rapid and robust detection technologies, providing with optimized treatment in isolation timely.
4)The close contact people should be quarantined with follow-up.
5)The healthy people should be aware of the severity of COVID-19 and take measures to protect themselves, such as staying at home, limiting social contacts, and wearing protective mask in public.
6)The authorities should encourage people to stay at home; discourage mass gathering; postpone or cancel public events; and close public institutions. These control measures will help COVID-19 infected countries to prevent the epidemic effectively.

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