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Review Paper

Corona Virus (COVID-19) Symptoms Prevention and Treatment: A Short Review

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Abstract

There is a new world health crisis threatening the public with spread of COVID-19 (Coronavirus Disease-2019). Since 2019 when Covid-19 emerged in Hunan seafood market at Wuhan, South China and rapidly spread throughout the world, the virus outbreak has been declared a public health emergency by the WHO. Corona virus causes respiratory infection including pneumonia, cold, sneezing and coughing while in animal it causes diarrhea and upper respiratory diseases. Corona virus transmitted human to human or human to animal via airborne droplets. Patient shows various symptoms like fever, cough, sore throat, breathlessness and fatigue. The disease is being cured through general treatment, symptomatic treatment and by other methods. This review outlines the Epidemiology, Diagnosis, Management and prevention of this fatal disease.

Keywords: Coronavirus disease-2019, COVID-19, Respiratory Syndrome, Symptoms, Prevention, Treatment.

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Introduction:

At the end of 2019, a series of pneumonia cases of unknown cause emerged in Wuhan, China¹. A few weeks later, in January 2020, deep sequencing analysis from lower respiratory tract samples identified a novel virus severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) as causative agent for the observed pneumonia cluster². Corona virus are a large family of virus which may cause disease in animals or humans. Corona virus is an RNA virus, with a typical crown-like appearance under an electron microscope due to the presence of glycoprotein spikes on its envelope³.

The virus is typically rapidly spread from one person to another via respiratory droplets produced during coughing and sneezing. It is considered most contagious when people are symptomatic. Common symptoms include fever, cough, sneezing and shortness of breath. Recommended preventive measures include washing your hands, covering the mouth maintain social distance and self-isolation for 14 days for people who are infected⁴.

Microbiology:

Corona virus is spherical or pleomorphic, single stranded, enveloped RNA and covered with club shaped glycoprotein. Corona viruses are four sub types namely alpha, beta, gamma and delta corona virus. Each of sub type corona virus has many serotypes⁵.

Epidemiology:

People can get the infection through close contact with a person who has symptoms from the virus includes cough and sneezing. Generally, corona virus spread via air-borne droplets. The virus might pass through the mucous membranes, especially nasal and larynx mucosa, then enters the lungs through the respiratory tract. Then the virus would attack the targeting organs that express angiotensin converting enzyme 2 (ACE2), such as lungs, heart, renal system and gastrointestinal tract^{6,7,8}. Pneumonia appears to be the most frequent serious manifestation of infection, characterized primarily by fever, cough, dyspnea and bilateral infiltrates on chest imaging. Other less common symptoms have included headaches, sore throat and

rhinorrhea. In addition to respiratory symptoms, gastrointestinal symptoms (e.g., nausea and diarrhea) have also been reported. Respiratory droplet transmission is the main route and it can be transmitted through person-to-person contacts by asymptomatic carriers^{9,10}.

Death Rate in COVID-19

The death rate in case of corona virus infection varies on a range of factors such as general health, age and the sex. Many studies showed that death rate increases with age. Children under 9 years of age seem to be largely unaffected while people over the age of 80 years and those with chronic disease are the most vulnerable. The evidence is growing that more men are becoming seriously ill or dying from the coronavirus than women⁴. The period from the onset of COVID-19 symptoms to death ranges from 6 to 41 days with a median of 14 days¹¹. This period is dependent on the age of the patient and status of the patient's immune system. The most common symptoms at onset of COVID-19 illness are fever, cough and fatigue, while other symptoms include sputum production, headache, hemoptysis, diarrhea, dyspnea and lymphopenia. The WHO has reported an incubation period for COVID-19 between 2 and 10 days. However, some literature suggest that the incubation period can last longer than two weeks and it is possible that a very long incubation period could reflect double exposure⁴.

Origin and Transmission of COVID-19

The first case of coronaviruses was seen in Wuhan City in China in December 2019. The novel coronavirus originated from the Hunan seafood market at Wuhan, South China where raccoon, dogs, bats, snakes, palm civets and other animals are sold and rapidly spread up to 109 countries⁴.

Replication:

Infection begins when the virus enters the host cell, the virus particle is uncoated and the spike protein attaches to its complementary host cell receptor. After attachment a proteolytic enzyme of the host cell cleaves and activates the receptor-attached spike macromolecules. Coronaviruses are the family of viruses that have prickly spikes that project from their surface. They have enveloped RNA viruses, are characterized by club like spikes, that project from their surface. These viruses are the cause of many types of diseases in mammals and birds which may be fatal⁴.

Diagnosis:

Coronavirus Disease-2019 tracking and diagnostic testing are critical and also critical to understand epidemiology, informing case management and to suppressing transmission. For patients with suspected infection, the following diagnosis techniques are utilized: performing real-time fluorescence (RT-PCR) to detect the positive nucleic acid of SARS-Co V-2 in sputum, throat, swabs and secretions of the lower respiratory tract samples¹². Beside this paper based COVID-19 test is also done in which a test strip of paper is required that is coated with antibodies which bind to particular COVID-19 protein. A second antibody is attached to gold nanoparticle and therefore the patient's sample is added to a solution of these particles. Then the test stripe is dipped in this solution. If the viral protein is present in the sample, it will be attached to the antibodies on the paper strip as well as the nanoparticle bound antibodies and a colored spot appears on the strip within 20 minutes⁴.

RNA Vaccines:

The Cambridge based biotech company Moderna prepared an experimental vaccine to diagnose coronavirus which was

RNA vaccine. RNA vaccines can target different viral proteins. The main object to developing such vaccines is that finding effective and safe ways to deliver them at the site of action⁴. Beside these other vaccines have also been developed in various countries including India which are now being administered to the public to prevent infection against this disease.

General Treatment:

A confirmed patient of COVID-19 needs complete bed rest and supportive treatment, ensuring adequate calorie and water intake to reduce the risk of dehydration. Water electrolyte balance and homoeostasis need to maintain along with the monitoring vital sign and oxygen saturation, measuring blood count, C-reactive protein, urine test and other blood biochemical index including liver and kidney function⁴.

Symptomatic Treatment:

Control measures are needed for patients with a high fever. Antipyretic drug treatment should be performed in case the temperature exceeds 39°C. Warm water bath and antipyretic patches are preferred as a preventive measure to lower the temperature. Chloroquine and hydroxychloroquine have antiviral activity in vitro as well as anti-inflammatory activities. Other experiments have shown that azithromycin in combination with hydroxychloroquine appeared to have additional benefit¹³.

Oxygen Therapy and Antiviral Drugs:

The chances of hypoxia are increased as the virus targets the lungs. Nasal catheter, oxygen mask should be immediately provided to the patient. Group of antiviral drugs including interferon, chloroquine phosphate, ribavirin and arbidol are therapeutically useful for the prevention, diagnosis and treatment of COVID-19⁴.

Prevention:

Prevention is, so far, the best practice in order to reduce the impact of COVID-19 considering the lack of effective treatment. The main measures are the following: (1) to use face masks; (2) to cover coughs and sneeze with tissues; (3) to wash hands regularly with soap or disinfection with hand sanitizer containing at least 60% alcohol; (4) to avoid contact with infected people; (5) to maintain an appropriate distance from people; (6) to refrain from touching eyes, nose, and mouth with unwashed hands¹³. Interestingly, the WHO issued detailed guidelines including: (1) regularly and thoroughly clean your hands with an alcohol-based hand rub or wash them with soap and water (2) Avoid touching eyes, nose and mouth (3) Practice respiratory hygiene covering your mouth and nose with your hand or tissues when you cough or sneeze (4) If you have fever, cough and difficulty breathing, seek medical care early (5) Stay informed and follow advice given by your healthcare provider (6) maintain at least 3 feet distance between yourself and anyone who is coughing or sneezing. In particular, regarding the use of face mask, health care workers are recommended to use particular respirators such as those certified N95 or Filtering Face Piece 2 (FFP2) when performing aerosol-generating procedures and to use medical masks while providing any care to suspected or confirmed cases. Moreover, while an individual without respiratory symptoms are not required to wear a medical mask when in public¹³.

Future Perspective:

The COVID-19 outbreak is proving to be an unprecedented disaster in countries like China, India, USA, Italy, Spain in all

aspects, especially health, social and economic. It is too early to forecast any realistic scenario, but it will have a strong impact worldwide. If high income countries, especially those already affected by the outbreak, seem to face a catastrophic perspective, in low-income countries there seem to be two possible scenarios. In particular, in the worst-case scenario, when the COVID-19 outbreaks, the majority of countries will be unprepared, with low resources allocated for affording the viral emergency and the consequences will be catastrophic. In best case scenario, COVID-19 will not affect Africa or South America on a large scale suggesting that respiratory viruses spread more effectively in the winter and, therefore, the southern hemisphere will be affected later in the year¹³. To this could contribute also the climate specific cultural differences (living more outdoors than indoors), the effect of UV light on the survival of the virus on surfaces, immunological differences of the population, preexposure with coronaviruses, or the higher temperatures¹⁴. This data was also indirectly supported by Chin and Colleagues that artificially reproduced different environmental conditions in order to study the virus survival capacity¹⁵.

Conclusion:

This review provides an insight into COVID-19 situation around the world. The review outlines the Epidemiology, Diagnosis, Management and prevention of this fatal disease. There is a rapidly growing body of literature on this topic and hopefully it will be controlled in future with best practice in management and treatment of cases. Only once this pandemic end, one will be able to assess the health, social and economic impact of this global disaster and we should be able to learn lessons especially in terms of Public and Global Health for any future similar pandemic.

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