INTRODUCTION

What is COVID – 19??

Corona virus disease 2019 (COVID-19) is defined as an infectious respiratory illness caused by a novel Corona virus now called Severe Acute Respiratory Syndrome Corona virus 2 (SARS-CoV-2; formerly called 2019-nCoV) [1].

History

COVID-19 was first identified in Wuhan City, Hubei Province, China amid an outbreak of respiratory illness cases. On December 31, 2019 it was initially reported to the World Health Organization (WHO). Later on 7th Jan 2020 the virus was recognized as a Corona virus on the basis of its similarity with the bat Corona virus (more than 95%) and with the SARS-CoV (more than 75%). This result indicated that the Corona virus had animal origin. Thereafter on January 30, 2020 the WHO declared COVID-19 outbreak a global health emergency. Further because of its widespread infection around the whole world on March 11, 2020, the WHO declared COVID-19 a global pandemic, which has resulted in travel restrictions and nationwide lockdowns in several countries [2]. Recently WHO termed the illness caused by SARS-CoV-2 as COVID-19 which is an acronym derived from "Corona virus disease 2019." In this acronym CO means Corona, VI means virus, D means disease and 19 depicts the year 2019 in which the disease was first observed. On February 11, 2020 an official designation for the novel virus: Severe Acute Respiratory Syndrome Corona virus 2 (SARS-CoV-2) was announced by the Corona virus Study Group of the International Committee on Taxonomy of Viruses [3].

What is Corona virus ??

Corona virus es belongs to subfamily Orthocoronavirinae in the family Corona viridae. These viruses can cause diseases both in mammals and birds. They cause mild to lethal respiratory tract infections in humans. Symptoms of mild illnesses include some cases of the common cold, while more lethal illness can

ABSTRACT

With the emergence of Corona virus Disease (COVID – 19) caused by the spread of 2019 novel Corona virus (2019-nCoV) the world is facing a new public health crisis. This virus is also known as Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). It is rapidly spreading from its origin in Wuhan City of Hubei Province of China in December 2019 to the rest of the world. It has affected over 200 countries in the world including India. Therefore, it is declared as a global public health emergency by the World Health Organization (WHO). This virus was transmitted to humans from animals and initially causes mild symptoms like fever, cough and fatigue in most people. But in some cases the symptoms become severe leading to pneumonia, acute respiratory distress syndrome (ARDS) and multi organ dysfunction. The diagnosis of this disease relies on a special molecular test. Since the research on novel Corona virus is on the preliminary stage no specific drug or vaccine has been developed yet for its treatment. Some of the already existing antiviral drugs viz., remdesivir, chloroquine, hydroxychloroquine and lopinavir/ritonavir combined with interferon beta are being tested for their efficacy to fight against this disease. Out of these chloroquine and hydroxychloroquine showed most promising results and hence has been recommended by FDA for treating people with COVID-19 on 28th March 2020. The present review systematically summarizes the clinical characteristics of COVID-19 as well as its diagnosis, treatment and prevention strategies. The focus of this article is to aware people around the world so that they would be able to effectively recognize and deal with the 2019 novel Corona virus (SARS-CoV-2).
cause Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome (MERS), and COVID-19. In other species symptoms may vary viz., an upper respiratory tract disease occurs in chickens, while in cows and pigs they cause diarrhea. The incubation period that is the time from exposure to onset of symptoms of Corona virus disease also varies among different organisms. It is typically around five days, but may range from two to fourteen days [4].

Morphology and Genome: These viruses are enveloped with a lipid bilayer coat and contain a positive-sense single-stranded RNA genome. It has a nucleocapsid of helical symmetry. The size of Corona virus es genome ranges from approximately 26 to 32 kilobases. It is one of the largest among RNA viruses [5]. Electron microscopic images of these viruses show that they have characteristic club-shaped spikes that project from their surface. The electron micrographs create an image reminiscent of the solar corona from which their name derives [6].

Proteins like membrane (M), envelope (E) and spike (S) structural proteins are anchored to the lipid bilayer of the viral envelope [7]. There is a nucleocapsid inside the envelope which is formed from multiple copies of the nucleocapsid (N) proteins. Their genome contains single-stranded positive-sense RNA which is present in the form of beaded string type conformation. All these conformational characteristics protect the virus when it is outside the host cell [8].

Discovery: In 1960’s the earliest human Corona virus strains viz., human Corona virus 229E and human Corona virus OC43 were discovered [9] [10]. They were studied in human patients with the common cold. This was followed by the subsequent discoveries of other human Corona virus including SARS-CoV in 2003, HCoV NL63 in 2004, HKU1 in 2005, MERS-CoV in 2012, and SARS-CoV-2 in 2019. Around seven strains of human Corona virus es are known so far. Most of these are involved in serious respiratory tract infections [11] [12]. Four of these strains generally produce mild symptoms of the common cold [13]. They are as follows:

1. Human Corona virus OC43
2. Human Corona virus HKU1
3. Human Corona virus 229E
4. Human Corona virus NL63

Three strains produce more severe symptoms. Some of these strains have cause serious disease outbreaks in the past as well (Table 1):

1. Middle East respiratory syndrome-related Corona virus (MERS-CoV)
2. Severe acute respiratory syndrome Corona virus (SARS-CoV)
3. Severe acute respiratory syndrome Corona virus 2 (SARS-CoV-2).

Why Corona virus is different from normal virus??

Studies have revealed that the novel Corona virus unlike normal viruses exhibit unique features which make them different from a normal virus. Some of these are:

- It can persist in air in form of aerosols for half an hour.
- Its genetic material (RNA) was found in cabins weeks after they were vacated.

These findings are the reasons behind the rumors that this novel virus was deliberately created or released by people as a biological weapon. But the actual fact is still unknown. However it is a well known phenomenon that sometimes a disease outbreak happens when a virus of animal origin such as that of a pig, bat or bird undergoes changes and passes to humans. This is likely how the new Corona virus came to be [14].

What are the Symptoms of COVID-19??

Fever, tiredness, dry cough and difficulty in breathing are the most common symptoms of COVID-19. Some patients may have aches and pains, nasal congestion, runny nose, sore throat or diarrhea (Table 2). These symptoms are usually mild and begin gradually therefore people with these symptoms should seek medical attention. There are three ways in which COVID – 19 symptoms develop [15]:

- In around 80% cases symptoms develop during the normal incubation time and the patients recover from the disease without any special treatment.
- In some rare cases (about 1 in every 6 cases) symptoms becomes severe making the patient seriously ill. It happens usually in case of elderly people already suffering from medical problems like high blood pressure, heart problems or diabetes.
- However in the rarest of the rare cases people neither develop symptoms nor do they feel unwell even after getting infected with corona virus.

<table>
<thead>
<tr>
<th>VIRUS</th>
<th>DISEASE</th>
<th>YEAR</th>
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<tbody>
<tr>
<td>SARS-CoV</td>
<td>Severe acute respiratory syndrome (SARS)</td>
<td>2002-2004</td>
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<tr>
<td>MERS-CoV</td>
<td>Middle East respiratory syndrome (MERS)</td>
<td>2012, 2015, 2018</td>
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<tr>
<th>Common Symptoms</th>
<th>Uncommon Symptoms</th>
<th>Severe Symptoms</th>
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<tbody>
<tr>
<td>Fever</td>
<td>Headache</td>
<td>High Fever</td>
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<tr>
<td>Dry Cough</td>
<td>Nasal Congestion</td>
<td>Coughing up Blood</td>
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<tr>
<td>Fatigue</td>
<td>Sore throat</td>
<td>Decreased white blood cells</td>
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<td></td>
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<td>Coughing up sputum</td>
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<td></td>
<td>Shortness of breath</td>
<td>Kidney Failure</td>
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<td>Pain in muscles/joints</td>
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<td></td>
<td>Chills</td>
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<td>Nausea/Vomiting</td>
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<td>Diarrhoea</td>
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What are the sites of infection of Corona virus ??

Corona virus mostly affects the lungs because the virus accesses host cells via the enzyme angiotensin-converting enzyme 2 (ACE2), which is most abundant in the type II alveolar cells of the lungs [20]. As ACE2 is abundantly
expressed in the glandular cells of gastric, duodenal and rectal epithelium as well as endothelial cells and enterocytes of the small intestine, the gastrointestinal organs are second most infected organs by the Corona virus \[21\]. Besides this studies have revealed that autopsies of people who died of COVID-19 show the presence of diffuse alveolar damage (DAD), and lymphocyte-containing inflammatory infiltrates within the lung.

What are the Modes of Transmission of the COVID-19??

Corona virus infection is most commonly spread from an infected person through following ways \[22\]

- By respiratory droplets released during coughing or sneezing.
- Through close contact with infected person by touching or shaking hands.
- By touching your eyes, nose or mouth with unwashed hands just after touching a virus containing surface.

Apart from these so far there are no reports on spread of this virus through ventilation system and water.

What are the methods of Diagnosis??

Real-time reverse transcription polymerase chain reaction (rRT-PCR) from a nasopharyngeal swab is the standard method of diagnosis. On the other hand in individuals where there is a high suspicion of infection based on symptoms and risk factors, Chest CT imaging may also be helpful for diagnosis but it is not recommended for routine screening \[23\].

What are the medications??

So far no medications are approved to treat the disease. However international research by government organizations, academic groups and industry researchers are underway for the synthesis of vaccines and medicines of COVID-19. In March, the “SOLIDARITY Trial” was initiated by the World Health Organization to assess the efficacy of existing antiviral compounds against the novel Corona virus and monitor their effects on the treatment process. Several antiviral medications including remdesivir, chloroquine and hydroxychloroquine, lopinavir/ritonavir combined with interferon beta are being evaluated for treatment of COVID-19 \[24\]. On the basis of these evaluation studies, the Italian Pharmaceutical Agency included chloroquine and hydroxychloroquine in the list of drugs with positive preliminary results for treatment of COVID-19 on 17th March. On the other hand the Korean and Chinese Health Authorities recommended the use of chloroquine. Finally, the FDA issued an emergency use authorization for hydroxychloroquine and chloroquine at the direction of physicians treating people with COVID-19 on 28th March 2020 \[25\].

What are the Preventive Measures??

The best ways to prevent the spread of infections of COVID-19 according to WHO guidelines are \[26\] \[27\]

**Wash your hands frequently:** Wash your hands with soap and water or clean them with an alcohol-based hand rub regularly and thoroughly.
problem. As a result of which they have to face negligence of the people around them which leads to an age – based discrimination.

Disabled People: People with some or the other kind of disability always face a challenge in availing health care facilities. The reason behind their deprivation from basic facilities may include discrimination, lack of affordability, accessibility etc. besides this due to their physical disabilities they are not able to follow the personal hygiene instructions viz., frequent washing of hands, cleaning of house floors etc. they require help and support of others for practicing these which does not allow them to stay isolated and thus becomes at high risk of COVID – 19 infection.

Youth: this segment of population is the most important for any countries economic and social welfare as they are the building pillars of their nations. The COVID-19 outbreak has affected the youth of countries around the world in two ways: firstly the youth pursuing education are no longer been able to attend their schools and colleges physically due to lockdown. This has made them deprived of quality education. Secondly, the employed youth is facing the problem of unemployment due to sudden economic breakdown around the world.

Thus, COVID-19 pandemic has hit different sections of people leading to a social crisis worldwide. Under such condition social protection systems should activate and stabilize the social breakdown by providing income security, food and other basic facilities to such group of people. This will not only reduce the prevalence of poverty but will also encourage people to manage this pandemic.

CONCLUSION

COVID-19 is a disease which is highly contagious caused by the novel Corona virus, SARS-CoV-2. Studies indicate that this virus is of animal origin. It is a very infectious virus which can be transmitted through close contact and droplets. The major signs and symptoms include fever, cough and fatigue. These symptoms are similar to that of SARS. But some patients develop life-threatening symptoms and such disease has posed a great threat to global health and safety. So, the burning issue of the present scenario is to control the spread of this pandemic and reduce the mortality as soon as possible. But by far, no specific drugs for the virus have been developed since the specific mechanism of the virus remains unknown. This has resulted in a new virus outbreak which has challenged the economic, medical and public health infrastructure of not only India but that of various countries around the world. Its deadly impact is prevalent in more than 200 countries around the world and only time will tell how the virus will impact our lives here in India. At present, to control the progress of the disease proactively it is important to control the source of infection, cut off the transmission route, and use the existing drugs. Thus for the safety of people's lives around the world it is necessary to develop specific drugs, promote the research and development of vaccines, and reduce morbidity and mortality of the disease.

References


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