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SARS CoV-2 SEVERE ACUTE RESPIRATORYSYNDROME CORONAVIRUS

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ABSTRACT

Since the initial report of a coronavirus-related pneumonia outbreak in December 2019, the virus SARS-CoV-2 that causes the infection/disease (COVID-19) has grown into a pandemic, more then100 million individuals sick in over 210 countries and two million people dying from COVID-19. This quick review highlighted what we've learnt so far in the areas of epidemiology, pathophysiology, sign and symptoms, diagnosis, effects on body, prevention, treatment and myth and facts about covid-19. Because there are several concurrent advances in each of these sectors, and some development and deployment took place at the same time.

INTRODUCTION

China's health officials detected a strange pneumonia with no known cause in late December 2019. The sickness was caused by a novel coronavirus, according to a quick genome study on March 11, 2020, the World Health Organization (WHO) had no choice but to designate the outbreak a pandemic due to its rapid expansion.[1]

Coronavirus (CoV) is a vast family of single-stranded, positive-sense RNA viruses in the Nidovirales order. The Roniviridae, Arteriviridae, and Coronaviridae families make up the order. The Coronaviridae family is divided into two subfamilies: Torovirinae and Coronavirinae. Coronavirinae are divided into four types: alpha-, beta-, gamma-, and delta-COVs. The taxonomy of these virus subtypes is based on phylogenetic grouping. The length of their viral RNA genome varies between 26 to 32 kilobases. They can be isolated from a variety of animals like Birds, livestock, and mammals like camels, bats, masked palm civets, mice, dogs, and cats are among them. COV is a significant pathogen due to its extensive distribution and infectivity.[2,3]

The Novel Coronavirus (CoV) is a brand-new Coronavirus strain. Coronavirus Disease 2019 (COVID-19) was initially found in Wuhan, China. The2019-nCoV belongs to the same virus family as the ones that cause SARS (Severe Acute Respiratory Syndrome) and even certain kinds of the common cold.[4] The majority of patients infected with the COVID-19 virus will have mild to moderate respiratory symptoms and recover without needing any specific therapy. People over the age of 65, as well as those with co-morbidities such as cardiovascular disease, diabetes, chronic respiratory disease, and cancer, are at a higher risk of developing serious illness. Wash your hands frequently or use an alcohol-based rub to protect yourself and others from infection, and avoid touching your face. When an infected individual coughs or sneezes, the COVID-19 virus transmits predominantly through droplets of saliva or discharge from the nose, therefore respiratory etiquette is particularly vital (for example, by coughing into a flexed elbow).[5]

EPIDEMIOLOGY

Epidemiology is a term that refers to the study of infectious diseases. More than 74.30 million people have been impacted by SARS-CoV-2 in China since the first verified diagnosis, with more than 1.67 million deaths lost (https://covid19.who.int/, as of December 19, 2020). Despite the fact that more than 52 million people have recovered from COVID-19, the war between SARS-CoV-2 and humans continues, and no particular therapies are available. The United States of America (USA) accounts for 22.7 percent of all instances of infection. India and Brazil were in second and third, with 13.5 percent and 9.6 percent of cases, respectively (https://covid19.who.int/, as of December 19, 2020). Although the death rate has decreased (September 10, 3.22; July 20, 6.65 percent; April 10, 22.36 percent; and February 2, 41.80 percent), the number of active COVID-19 patients has not decreased significantly (>700,000 daily cases on December 19, 2020). COVID-19 occurrence is affected by a variety of parameters, including comorbidities, age, gender, health, and living situations.[6,7] Diabetes, cardiovascular, lung, kidney, and renal disorders all showed an increase in illness severity.[8]

One in every five people with comorbidities is at risk of severe COVID-19 infection after infection.[9] COVID-19

is more severe in older adults aged 50–60 years[10], and it became more lethal in people over 70 years old regardless of chronic disease complications, according to case reports from China. COVID-19 was found to be substantially more deadly in men than in women in a gender-based meta-analysis study of European countries.[11]

The majority of the cases that were initially reported had a travel history from Wuhan, China.[12] Following that, coronavirus illness was recorded in Thailand, Singapore, South Korea, Japan, the United States, and France in 2019. (COVID-19 cases).[13] In the initial phase, the bulk of the cases (78 percent) were male and in the 30–69-year-old age category (51 percent). The COVID-19 case-fatality rate ranged from 2.3 percent in China to 9% in Italy.[14,15] COVID-19 had a five-day median incubation period and a basic reproductive number of 2.2.[16]

The first laboratory-confirmed case of COVID-19 was reported on January 30 in Kerala, with a history of travel from Wuhan, China. The first three cases were recorded at the end of January and the beginning of February in the year 2020. There were no cases between February 4 and March 1, 2020, as a result. Cases began to increase across multiple Indian states on March 2, 2020.[17] Currently, clusters have been recorded from numerous settings around the country, including but not limited to. Currently, the status of COVID19 in India is described via a national dashboard,[18] state-level media bulletins,[19,20] syndromic data from sentinel sites and laboratories, and[21,22] syndromic data from sentinel sites and laboratories.

Till 5th September 2021, India may have reached 32988673 cases, in which 440567 people died and 32138092 have recovered from Corona.[23]

PATHOPHYSIOLOGY

Coronavirus disease 2019 (COVID-19) is a major public health hazard that can be fatal, particularly in the elderly. The SARS-CoV-2 virus causes COVID-19, an illness. Although there is a lot of information regarding the clinical disease's mortality, there is a lot less information about its pathobiology. Although the cellular reactions to this virus are unknown, a likely sequence of events can be predicted based on previous SARS-CoV studies. For formulating research questions and developing hypotheses, a cellular biology approach is helpful to explaining the clinical course by concentrating on the affected parts of the respiratory tract COVID-19 can be split into three phases based on the cells that are likely infected, which correspond to distinct clinical stages of the disease.[24]

Stage 1:- Asymptomatic stage (first 1–2 days after infection) SARS-CoV-2 inhaled virus attaches to epithelial cells in the nasal cavity and begins reproducing. Both SARS-CoV2 and SARS-CoV use the ACE2 receptor.[25,26] The ciliated cells are initial cells infected in the conducting airways.[27] However, single-cell RNA suggests that ACE2 expression in conducting airway cells is low, with no obvious cell type preference. The virus is spreading locally, but there is just a modest innate immune response. Nasal swabs can detect the virus at this stage. The viral RNA RT-PCR result may be beneficial in predicting viral load, in the future infectivity, and clinical course. These investigations may be able to detect super spreaders. The sample collecting process would have to be standardized for the RT-PCR cycle number. Swabs from the nose may be more sensitive than swabs from the throat.[28]

Stage 2: - Response of the upper airway and the conducting airway (next few days) The virus spreads and migrates down the respiratory system along the conducting airways, triggering a stronger innate immune response. CXCL10 (or another innate response cytokine) levels may be predictive of future clinical outcomes.[29] Beta and lambda interferons are produced in large quantities by virally infected epithelial cells.[30] CXCL10 is an interferon-responsive gene with a high signal-to-noise ratio in the response of alveolar type II cells to SARS-CoV and influenza.[31,32] CXCL10 has also been suggested as a disease sign for SARS.Determining the host's innate immune response could help anticipate the disease's future course and the need for more rigorous monitoring. The disease will be mild in around 80% of infected people, and will largely affect the upper and conducting airways. These people can be closely followed at home while receiving conservative symptomatic therapy. The released viral particles infect type II cells in nearby units, resulting in a self-replicating pulmonary toxin. I believe that parts of the lung will lose the majority of their type II cells, triggering a secondary pathway for epithelial regeneration. Type II cells are normally the precursors of type I cells. This proposed sequence of events has been demonstrated in a mouse influenza pneumonia model.[33,34]

Stage 3: -Hypoxia, ground glass infiltrates, and ARDS development in Stage 3 Unfortunately, approximately 20% of infected patients may advance to stage 3 disease and develop lung infiltrates, with some developing very severe disease. The fatality rate is first estimated to be around 2%, however this fluctuates significantly with age. Once the prevalence of mild and asymptomatic cases is better determined, the death and morbidity rates may be changed.

The virus has now infected alveolar type II cells in the lung's gas exchange units. In comparison to type I cells, SARS-CoV and influenza preferentially infect type II cells.[35,36] Infected alveolar units are usually seen in the periphery and subpleural space.[37,38] SARS-CoV replicates in type II cells, releasing a huge number of virus particles before the cells die of apoptosis. The released viral particles infect type II cells in nearby units, resulting in a self-replicating pulmonary toxin. It is believed that parts of the lung will lose the majority of

their type II cells, triggering a secondary pathway for epithelial regeneration. Type II cells are normally the precursors of type I cells. This proposed sequence of events has been demonstrated in a mouse influenza pneumonia model.[39,40] SARS and COVID-19 cause extensive alveolar destruction, which is characterized by fibrin-rich hyaline membranes and a few multinucleated large cells.[41,42] Other kinds of ARDS may cause more severe scarring and fibrosis due to abnormal wound healing. A robust innate and acquired immune response, as well as epithelial regeneration, will be required for recovery. Administering epithelial growth factors such as KGF, similar to influenza, may be harmful and may increase viral load by creating more ACE2 expressing cells. Because of their weakened immune responses and lower ability to heal injured epithelia, the elderly are particularly vulnerable. The elderly also have lower mucociliary clearance, which may make it easier for the virus to move to the lung's gas exchange units.[43] The pathophysiology of COVID-19 has considerable information gaps that will be filled in the coming months. Existence of other receptors for viral entrance is yet to be established. SARS-CoV has an alternative receptor, CD209L.Microvilli on type II cells and apical cilia on airway cells may both play a role in viral entrance. In conclusion, COVID-19 restricted to the conducting airways, should be treated symptomatically at home.COVID-19 that has progressed to the lung's gas exchange units, on the other hand, must be closely monitored and supported to the best of our abilities while we wait for particular antiviral medications to be developed and tested.[44]

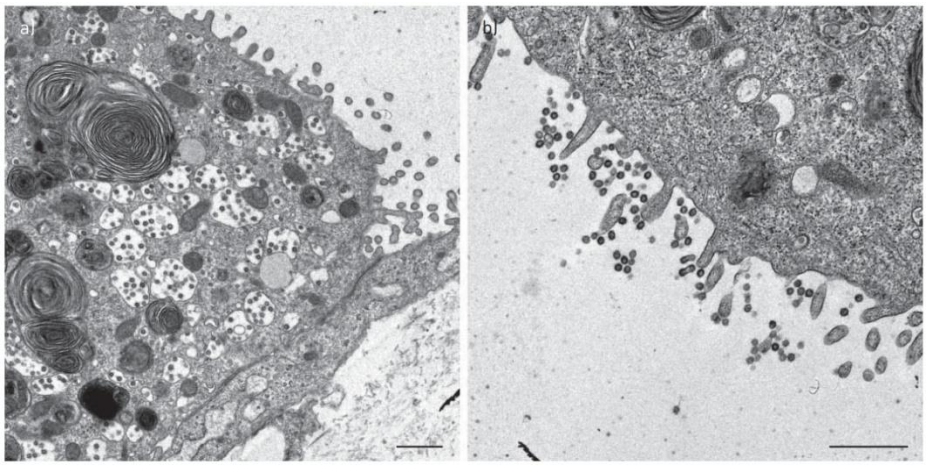

Figure 1: SARS-CoV-infected human alveolar type II cells. SARS-CoV was introduced into human type II cells, which were isolated, grown in vitro, and subsequently infected. In type II cells, viral particles may be observed in double membrane vesicles (a) and along the apical microvilli (b).[45]

SIGN AND SYMPTOMS

Fever, dry cough, and exhaustion are the most prevalent symptoms.

Symptoms that are less common

Aches and pains, a sore throat, diarrhea, conjunctivitis, headache, loss of taste or smell, a rash on the skin, or discoloration of the fingers or toes are all symptoms to look out for.

Serious symptoms

Breathing difficulties or shortness of breath chest pain or pressure loss of speech or mobility are serious symptoms. If you are experiencing severe symptoms, seek medical help. Mild symptoms should be managed at home by people who are otherwise healthy. It takes 5–6 days on average for symptoms to appear when a person is infected with the virus.[46]

COVID-19, on the other hand, can create symptoms such as

Gastrointestinal symptoms: -Symptoms of the gastrointestinal tract COVID-19 can produce nausea, vomiting, or diarrhea on its own or in combination with other COVID-19 symptoms. Symptoms of the gastrointestinal tract can appear before a fever or respiratory symptoms.

Loss of taste and smell: -A common early symptom of COVID-19 is a new loss of smell or taste without nasal congestion. According to studies, most alterations in smell and taste disappear within 30 days. Moderate to severe changes in smell and taste, on the other hand, can last for 60 days or longer in some persons.

Changes in the skin: -A flat, red rash with small bumps, discolored regions on the fingers and toes (COVID toes), and hives are the most prevalent skin alterations connected to mild to severe COVID-19.Children and young people seem to be more susceptible to COVID toes. Swelling or discoloration of one or more toes or digits can occur. Blisters, itching, and rough skin, it is possible to have soreness or uncomfortable raised lumps. A little amount of pus may form beneath the skin. The symptom can linger anywhere from 10 to 14 days to months. Swollen, discolored fingers or toes, on the other hand, could indicate chilblains, an inflammatory skin

ailment. Chilblains form as a result of prolonged exposure to cold air.

Confusion: - Severe confusion (delirium) is probably the primary or most effective symptom of COVID-19 in older people. This COVID-19 symptom is connected with an excessive hazard for bad outcomes, along with death.

Eye troubles: - Pink eye (conjunctivitis) may be a symptom of COVID-19. Research shows that the maximum not unusual place eye troubles connected to COVID-19 are mild sensitivity, sore eyes and itchy eyes.[47]

No Symptoms

According to some researchers, up to 40% of patients with COVID-19 are asymptomatic. This means they don't feel ill or show any signs of illness. However, the infection can still cause harm to our health. Some persons without symptoms have lung damage, including "ground-glass opacities," which are a common lung lesion in people with COVID-19.[48]

DIAGNOSIS

COVID-19 diagnostic testing is used to determine whether a person has been infected with the SARS-CoV-2 virus, which causes COVID-19 infection. If someone have COVID 19 symptoms such as a high temperature, cough, shortness of breath, or severe exhaustion, your healthcare provider may advise you to make a diagnosis.[49]

Table 1: Diagnosis tests for covid-19.

	MOLECULAR TEST	ANTIGEN TEST	ANTIBODY TEST
Also known as…	Diagnostictest,viraltest,molecular test,nucleicacidamplificationtest (NAAT), RT-PCR test, LAMPtest	Diagnostic test, viral test, rapid test	Serological test, serology, blood test, serology test
How the sample is taken…	Nasal swabs, either shallow or deep (most tests). Saliva (some tests)	Nasal or nasopharyngeal swab (most tests)	Blood from a fingerstick or vein
Howlongittakesto getresults…	Less than an hour (at-home tests andsomepoint-of-carelocations), same day (some point-of-care locations)or1-3days(testssentto a lab for processing). Some tests maytakelongerinsomelocations, dependingontestingcapacity.	Some may be very fast (15–30 minutes),dependingonthetest	Same day (some point-of-care locations)or1-3days(testssent toalaboratoryforprocessing)
Is another test needed…	Not usually. This type of test is typically highly accurate andmusually does not need to berepeated.Somemayindicate the need to re-test in certain circumstances.	Maybe. Positive results are usually highlyaccurate, butfalsepositives can happen, especially in areas where very few people have the virus. Negativeresultsmayneedto beconfirmedwithamoleculartest.	Sometimes a second antibody test is needed for accurate results.
What it shows…	Diagnoses active COVID-19 infection.(Sometestsmayalso diagnose influenza or other respiratoryviruses)	Diagnoses active COVID-19 infection.(Sometestsmayalso diagnose influenza or other respiratoryviruses)	Shows if you've been infected by the virus that causes COVID-19 in the past
What it can't do…	It cannot show if you ever had COVID-19 or were infected with the virus that causes COVID-19 in the past	ItmaynotdetectanearlyCOVID-19 infection. Yourhealthcareprovider may order a molecular test if your antigen test shows a negative result, but you have symptoms of COVID-19.Italsocannotshowifyou everhadCOVID-19orwere	ItcannotdiagnoseCOVID-19at thetimeofthetestorshowthat youdonothaveCOVID-19

RT-PCR and antibody tests are available in table-1. If someone have an active Covid-19 infection, diagnostic tests might reveal that you need to quarantine or isolate yourself from others. Diagnostic techniques such as molecular Diagnostic techniques and antigen tests can determine whether or not someone have an active COVID-19 infection. A nasal or throat swab, or saliva collected by spitting into a tube, are used to collect samples for diagnostic tests.Antibody testing used to check for antibodies produced by our immune system in response to the virus that causes COVID-19, SARS-CoV-2 infection. Antibody testing should not be used to

diagnose a COVID-19 infection that is still ongoing. Antibodies can take days or weeks to form after an infection, and they can persist in your blood for weeks or months after you've recovered.[50]

THE IMPACT ON THE BODY

What COVID-19 Is Capable Of

Doctors are still learning more about COVID-19's short- and long-term impacts on your body. It starts with ordinary flu symptoms for some people. However, it has the potential to harm your lungs, liver, kidneys, and even your brain. (See Figure-2).

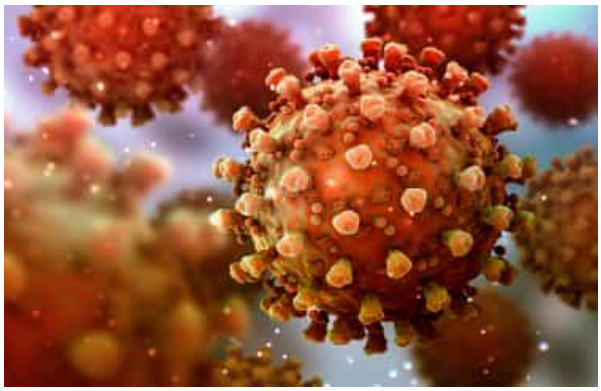

Figure 2: Coronavirus.

Infection of the upper respiratory tract-The virus normally settles in the cells that line your nose, nasal cavity, and throat once it enters your body. For the most part, this is how it stays. Symptoms usually appear after a few days, but you may not notice anything for up to two weeks as the virus invades and reproduces healthy cells. Even if you don't display any symptoms, you can pass it on to others. (See Figure-3)

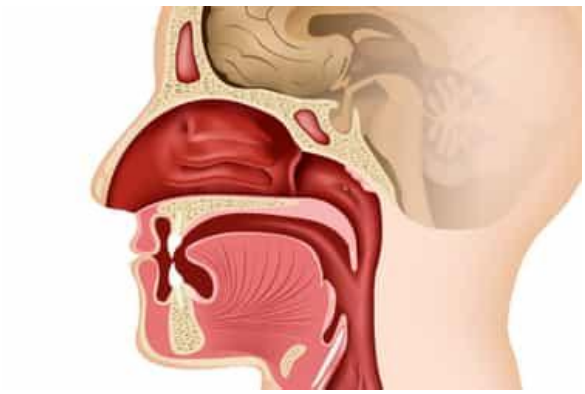

Figure 3: Infection in upper respiratory system.

Effects on lower respiratory system- If your immune system is unable to control COVID-19 within the first week, the virus may spread to your lungs. It attacks the cells that line them there. Fluid and mucus build up, making it more difficult for oxygen to reach your bloodstream. Breathing becomes difficult. This is a case of pneumonia. The majority of people recover in a week or two, but it can take longer in other cases. (See Figure-4).

Figure 4: Effects on lower respiratory systems.

Acute respiratory distress syndrome [ARDS] - COVID-19 pneumonia worsens swiftly in acute respiratory distress syndrome (ARDS), and your body's response can further damage your lungs. The tiny, delicate air sacs that carry oxygen to your blood (called alveoli) begin to fill with muck. X-rays and CT scans can reveal big areas of your lung that aren't getting any air. Your blood oxygen levels drop dangerously low, and you'll almost certainly require a ventilator to help you breathe. (See Figure-5)

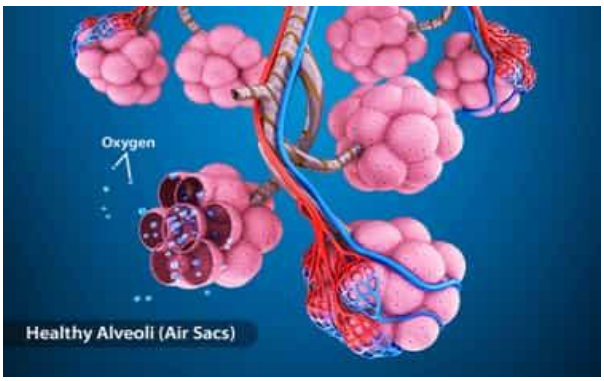

Figure 5: ARDS.

Immune system issues-Many experts believe that an overactive immune response is to blame for many of COVID-19's more serious side effects. When cytokines, chemical signaling signals, reach dangerously high levels, immune cells begin to target healthy tissues. This is referred to as a cytokine storm by doctors. Low blood pressure, organ failure, and blood vessel injury are all possible outcomes. (See Figure-6)

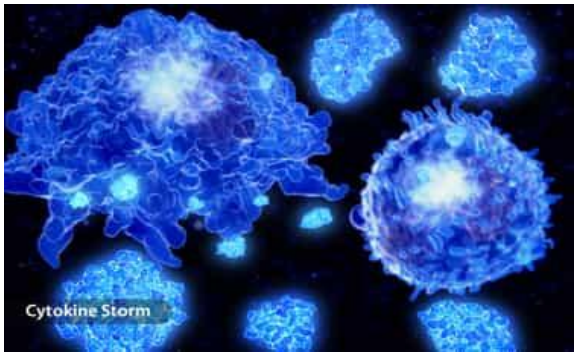

Figure 6: Immune systems issues.

Heart problems-Doctors have found a number of heart problems in COVID-19 patients, particularly those who are critically unwell. These are some of them: Arrhythmia. A rapid or skipping heart Cardiomyopathy. Thickened, rigid cardiac tissue makes your heart weaker. Acute myocardial infarction. Troponin is a protein that your body produces in large amounts. (See Figure-7)

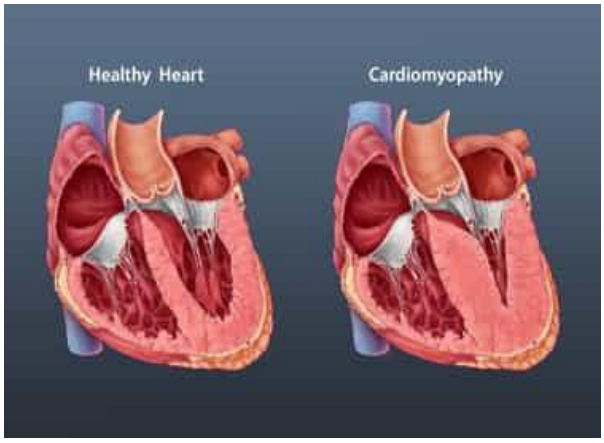

Figure 7: Heart problems.

Trouble with blood vessels-COVID-19 appears to be capable of attacking blood vessel cells. It can produce blood clots, which can lead to a stroke or pulmonary embolism, in addition to heart problems. People with COVID-19 who are extremely unwell have substantially higher levels of a chemical called "D-dimer" in their blood. This means there will be more blood clots. (See Figure-8)

Figure 8: Truble with blood vessels.

Brain related problems-COVID-19 appears to have a negative impact on your nervous system, including seizures. They may be caused by brain enlargement or inflammation of the central nervous system. Other signs and symptoms that your brain may be causing include:

Consciousness loss is a condition in which a person loses consciousness, Loss of olfactory perception, Stroke. (See Figure-9)

Figure 9: Brain releted problems.

Problems with the Liver- In the hospital for COVID-19, up to half of the patients had enzyme levels in their blood that indicate liver damage. It's possible that the infection isn't to blame. This can also be caused by medication or an overworked immune system. (See Figure- 10)

Figure 10: Problems with Liver.

Problems with the eyes-Conjunctivitis, also known as pinkeye, affects around a third of those admitted to the hospital with COVID-19. When an allergen irritates the tissue that covers your eye and the inside of your eye ball, it causes it to become inflamed. (SeeFigure- 11)

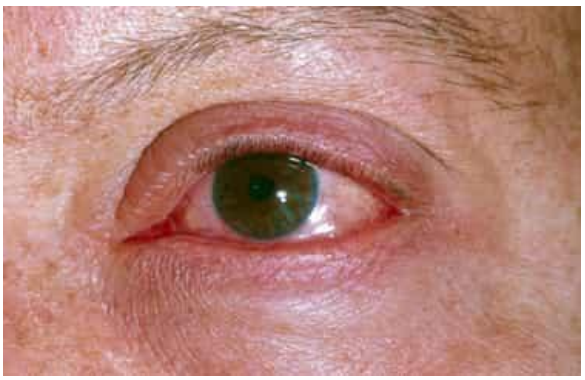

Figure 11: Problem with Eyes.

Kidney Impairment-This is typical in COVID patients who are critically unwell. Medication, a malfunctioning immune system, low blood pressure, and pre-existing illnesses can all contribute to this. (See Figure- 12)[51]

Figure 12: Kidney impairment.

TREATMENTS

There is no specific treatment available for COVID-19. The WHO announced the launch of a clinical trial for COVID-19 medicines entitled "Solidarity".[52] This is an international joint study that looks into the use of a few promising COVID-19 medicines, which are detailed further down.[53]

The interventional studies for COVID-19 have primarily focused on antimalarial and antiviral medicines (Table 1), with over 200 research examining the use of various forms of oxygen therapy. The majority of trials are focused on improving clinical status, lowering viral loads, reducing time to improvement, and lowering fatality rates. Both severe and moderate examples are covered in these investigations.

Antimalarial Drugs in the Treatment of SARS-CoV-2

In the cases of SARS and MERS, the use of chloroquine for the treatment of corona virus-based infection has shown some promise in preventing viral replication. It was not, however, verified on a wide scale in a randomized control trial.[54-56] Chloroquine (CQ) and Hydroxychloroquine (HCQ) are the antimalarial medicines of choice (HCQ). The use of CQ for COVID-19 was made public by the Chinese, particularly through Gao et allotter.'s to the editor of Bioscience Trends.[57] According to the letter, CQ has been shown to be effective against COVID-19 in multiple investigations. The letter, on the other hand, was short on details. Interest in these two agents rose rapidly and widely in a short period of time. Chloroquine inhibits viral replication in vitro, according to preliminary findings.[58,59]

HCQ and CQ act by increasing the pH of the lysosome, which is the cellular organelle in charge of phagocytic breakdown. Its role is to join with phagocytosed cell contents and break them down in some immune cells as a downstream mechanism, allowing some of the broken proteins to be displayed as antigens, increasing immunological recruitment against an antigen/pathogen. The medicine could be given alone or in combination with azithromycin.The fact that azithromycin has been shown to have some immunomodulatory properties in airway-related illness may support its use. In respiratory diseases, it appears to inhibit the release of pro-inflammatory cytokines.[60] However, when HCQ and azithromycin are used together, there is a recognized pharmacological interaction that raises the risk of QT interval prolongation.[61] In individuals with G-6-PD impairment, quinine-based medicines have been linked to QT prolongation, retinal injury, hypoglycemia, and blood hemolysis. HCQ may have little effect for severe or critically ill patients with COVID-19 who require ventilation or die, according to several preprints, including a meta-analysis.[63,64] After previously recommending their use for SARS-CoV-2 infection, the US now advises against using these two medications as of April 21, 2020, based on new research.[62]

Antiviral Drugs in the Treatment of SARS-CoV-2

Antiviral drugs such as Lopinavir and Ritonavir are commonly used in the treatment of HIV/AIDS. Other antiviral medications, such as nucleoside analogues like Favipiravir, Ribavirin, Remdesivir, and Galidesivir, have been investigated for their potential to block viral RNA production.[63] The WHO's Solidarity trial includes Lopinavir, Ritonavir, and Remdesivir among these medications.

Remdesivir is an adenosine nucleotide analogue that binds to viral RNA and prevents it from replicating, resulting in chain termination. This medication was created to treat the Ebola Virus Disease.[64] Rhesus macaques infected with SARS-CoV-2 were used in a study.[65] The monkeys were given Remdesivir or vehicle after 12 hours of infection in that trial. The medicine was well-tolerated in the lungs, and the animals given the treatment had a higher clinical score than the control group. The study's radiographic data also showed that the rats given Remdesivir had reduced lung damage. Although viral replication was reduced, virus shedding was not. Furthermore, no mutations were discovered in the RNA polymerase sequences. A randomized clinical control study with 158 Remdesivir-treated patients and 79 placebo-treated patients published in late April 2020[66] indicated that Remdesivir shortened the time to recovery in the Remdesivir-treated arm to 11 days, compared to 15 days in the placebo-treated arm. Despite the fact that this was not statistically significant, the agent provided a foundation for additional research. The death rate after 28 days was found to be similar in both groups. This has now given us a foundation on which to build future molecules. The National Institute of Health in the United States funded the research. The study's authors called for more Remdesivir clinical studies with a bigger population. Larger investigations are currently underway, and the results are expected soon. Remdesivir is now one of the most promising COVID-19 treatments. In a preliminary experiment in China, Lopinavir and Ritonavir were found to have no advantage when compared to routine clinical therapy. More research on this medicine is now being conducted, including one in India.[67,68] (See Table-2)

Table 2: Medicines used in covid-19.

Drug class	Drug list
Antiviral	Remdesivir, Lopinavir/ritonavir, Favipiravir, Oseltamivir
Antiprotozoal drugs	Hydroxychloroquine, Chloroquine, Nitazoxanide
Vaccines, immunoglobulin therapies, and immunostimulants	Convalescent plasma, BCG Vaccine, Levamisole/Isoprinosine
Biologicals and kinase inhibitors	Tocilizumab, Canakinumab, Siltuximab, Lenzilumab, Ravulizumab, Sarilumab, Imatinib, Baricitinib, Ruxolitinib
Antibacterial drugs	Azithromycin, Amoxicillin/Clavulanate
Cardiovascular drugs	Telmisartan, Sildenafil citrate, Losartan, Simvastatin, Enoxaparin, Aspirin, Nafamostat mesilate
Other agents	Naproxen
	Colchicine
	Isotretinoin
	Levamisole, Ivermectin
	Almitrine
	Anakinra
	Tacrolimus
	Deferoxamine
	Famotidine
Non-pharmacological interventions	Diet, Non-invasive oxygenation, Intubation, Hyperbaric oxygenation

Plasma from Recovering Patients

Another alternative is to use serum from people who are recovering from illness, as this is known to have antibodies that can neutralize the virus and aid in its eradication. This method has previously been used to treat other coronavirus infections.[69] In comparison to other therapies that have been tested, early emerging case reports in this area appear promising.[70-73] Five patients treated with plasma recovered and were finally weaned off ventilators, according to a Chinese report. They had lower fevers and viral loads, as well as better oxygenation. After 12 days of plasma transfusion, the virus was not discovered in the patients. The US Food and Drug Administration has issued specific guidelines for the use of investigational COVID-19 Convalescent Plasma.[74] This method has the added benefit of being able to be employed for post-exposure prophylaxis. This strategy is starting to catch on in other nations, with over 95 trials registered on clinicaltrials.gov alone, with at least 75 of them being interventional. Although mostly for research purposes, the use of convalescent patient plasma looks to be the best and, thus far, the only successful therapy option was available, until the vaccine comes.[75]

Nonsteroidal anti-inflammatory medications (NSAIDs)

Nonsteroidal anti-inflammatory medicines (NSAIDs) are among the most widely prescribed medications, with a wide range of applications. Nonselective cyclooxygenase (COX) inhibitors (such as ibuprofen, aspirin (acetylsalicylate), diclofenac, and naproxen) and selective COX2 inhibitors (such as ibuprofen, aspirin (acetylsalicylate), diclofenac, and naproxen) are examples of NSAIDs (such as celecoxib, rofecoxib, etoricoxib, lumiracoxib, and valdecoxib).Concerns have been raised that NSAIDs, particularly COVID-19, may be linked to an increased risk of side effects when administered in individuals with acute viral respiratory infections.

Examining the evidence

There were a total of 73 studies in all (28 studies in adults, 46 studies in children, and one study in adults and children). None of the research expressly addressed COVID-19, SARS, or MERS, although they all dealt with acute viral respiratory illnesses or disorders induced by respiratory viruses. The evaluation found that there was only a small amount of confidence evidence on mortality in adults and children.[76] The effects of nonsteroidal anti-inflammatory drugs (NSAIDs) on the risk of ischemic and hemorrhagic strokes, as well as myocardial infarction, in people with severe respiratory infections remain unknown.[77,78] There was little or no difference between ibuprofen and acetaminophen (paracetamol) in terms of effects on death from any reason, hospitalization for any cause, acute renal failure, and severe gastrointestinal bleeding in children with fever, according to moderate to high certainty evidence.[79-82] The majority of studiesstate that no serious adverse events occurred, or that only mild or moderate adverse events occurred. There was no indication that NSAID use had an influence on acute health-care utilization, explicit quality-of-life indicators, or long-term survival.[83-86]

Oxidation

- The Panel recommends high-flow nasal cannula (HFNC) oxygen over noninvasive positive pressure ventilation (NIPPV) for people with COVID-19 and acute hypoxemic respiratory failure despite conventional oxygen therapy (BIIa).
- For people with COVID-19 and acute hypoxemic respiratory failure for whom HFNC is not accessible, the Panel suggests a closely supervised trial of NIPPV in the absence of a rationale for endotracheal intubation (BIIa).
- For patients with persistent hypoxemia despite increased supplementary oxygen needs and for whom endotracheal intubation is not otherwise needed, the Panel suggests using awake prone positioning to enhance oxygenation.
- The Panel advises against utilizing awake prone positioning as a rescue strategy for refractory hypoxemia in patients who otherwise meet the intubation and mechanical ventilation criteria (AIII).
- Because of the increased risk of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) exposure to health care providers during intubation, the technique should be conducted by an experienced practitioner in a controlled setting (AIII).

Rationale

In COVID-19, severe sickness usually occurs about a week following the onset of symptoms. Dyspnea is the most common symptom, which is frequently accompanied by hypoxemia. Patients with severe disease often require supplemental oxygen and should be constantly monitored for worsening respiratory status, since some may develop acute respiratory distress syndrome (ARDS).

Oxygenation's Purpose

In people with COVID-19, the ideal oxygen saturation (SpO2) is unknown. However, a target SpO2 of 92 to 96 percent seems reasonable, given that indirect data from patients without COVID-19 implies that SpO2 levels of 92 to 96 percent may be hazardous.

A meta-analysis of 25 randomized studies involving patients without COVID-19 indicated that a liberal oxygen approach (median SpO2 of 96 percent) was linked with an elevated risk of in-hospital mortality when compared to a lower SpO2 comparator (relative risk 1.21; 95 percent CI, 1.03–1.43).[87]

Vaccination

A COVID 19 vaccine is a vaccine designed to provide acquired immunity against the virus that causes coronavirus disease, the severe acute respiratory syndrome coronavirus 2 (SARS CoV 2). (COVID 19). Prior to the COVID 19 pandemic, there was a well-established body of information about the structure and function[88] SARS-CoV-2 genetic sequence data was exchanged through GISAID on January 10, 2020, and the global pharmaceutical sector declared a strong commitment to address COVID-19 on March 19, 2020.[94] COVID-19 vaccinations have been largely credited with lowering the spread, severity, and death caused by the virus. {93)SARS-CoV-2 genetic sequence data was exchanged through GISAID on January 10, 2020, and the global pharmaceutical sector declared a strong commitment to address COVID-19 on March 19, 2020.[89] COVID-19 vaccinations have been largely credited with lowering the spread, severity, and death caused by the virus.[90]

Pfizer–BioNTech

The Pfizer–BioNTech COVID-19 vaccine, also known as Comirnaty, is an mRNA vaccine developed by BioNTech in Germany and Pfizer in the United States, Fosun Pharma distributes Comirnaty in Hong Kong, Macau, and Taiwan.

V Sputnik

The Russian Gamaleya Research Institute of Epidemiology and Microbiology developed the Sputnik V COVID-19 vaccine, which is a viral vector vaccine.

Covaxin

Bharat Biotech and the Indian Council of Medical Research collaborated to develop Covaxin, an inactivated viral vaccine.

EpiVacCorona

The Russian State Research Center of Virology and Biotechnology developed EpiVacCorona, a peptide vaccination.

ZyCoV-D
Cadila Healthcare, an Indian pharmaceutical business, developed ZyCoV-D, a DNA plasmid-based COVID-19 vaccination with backing from the Biotechnology Industry Research Assistance Council.

Minhai
Minhai COVID-19 vaccine, developed by Minhai Biotechnology Co. And Shenzhen Kangtai Biological Products Co. Ltd. In China, is an inactivated virus vaccine.[91]

PREVENTION

SELF CARE
Self-care is important.

- COVID-19 asymptomatic and mild cases: Isolate yourself in a room with good ventilation. Use a triple-layer medical mask and throw it away after 8 hours of use or sooner if it gets wet or visibly filthy. If a caregiver enters the room, both the caregiver and the patient should consider wearing the N 95 mask. Only after sanitizing the mask with 1 percent Sodium Hypochlorite should, it be discarded. Maintain proper hydration by resting and drinking plenty of fluids.
- At all times, observe respiratory etiquette. Handwashing with soap and water for at least 40 seconds or cleaning with an alcohol-based sanitizer should be done on a regular basis. Personal items should not be shared with other members of the family.
- Using a pulse oximeter, check your oxygen saturation on a daily basis. If you detect any changes in your symptoms, contact your treating physician right once. Caregivers should follow these instructions:
- A triple-layer medical mask should be used by the caregiver. When in the same room as the sick person, a N95 mask may be considered.
- Hand hygiene must be maintained after interaction with an unwell individual or the patient's immediate environment. Patient/environment patient's exposure: Avoid direct contact with the patient's bodily fluids, especially oral or respiratory secretions. When handling the patient, wear disposable gloves. Hand hygiene should be practiced both before and after removing gloves.[92]

ISOLATION AND QUARANTINE
When you think, you've been exposed to a virus, you quarantine yourself, even if you don't have symptoms, you should isolate if you've been infected with the virus.

Quarantine
Unless you have been fully vaccinated, quarantine if you have been in close contact (within 6 feet of someone for a cumulative total of 15 minutes or more over a 24-hour period) with someone who has COVID-19. Unless they exhibit symptoms, people who are completely vaccinated do not need to quarantine after contact with someone who has COVID-19.

Fully vaccinated people, on the other hand, should get tested 3-5 days after exposure, even if they have no symptoms, and wear a mask inside in public for 14 days after exposure or until their test result is negative.

- What should I do?

After your last interaction with someone who has COVID-19, stay at home for 14 days.COVID-19 symptoms include fever (100.4°F), cough, shortness of breath, and other symptoms. If at all possible, avoid persons you live with, particularly those who are at a higher risk of becoming very sick with COVID-19.

- After quarantine

Following the quarantine period, keep an eye out for signs for at least 14 days after you've been exposed. Self-isolate and notify your local public health authority or healthcare practitioner if you develop symptoms. You might be able to cut your quarantine time in half.Based on local conditions and needs, your local public health authorities make the final decisions regarding how long the quarantine should last. If you need to quarantine, follow the advice of your local public health agency. Stopping the quarantine is one of the options they'll evaluate, After ten days of no testing, After receiving a negative test result on day 7, (test must occur on day 5 or later.

Isolation
Isolation is a technique for separating people who are infected with COVID-19 from those who are not.Isolated people should stay at home until it is safe for them to interact with others. Anyone who is unwell or infected at home should isolate themselves from others, stay in a designated "sick room" or area, and use a separate bathroom (if available).

- What should I do?

- Keep an eye on your symptoms. If you experience an emergency warning sign (such as difficulty breathing), seek medical help right away.
- If at all feasible, stay in a separate room from the rest of the family.
- If at all feasible, use a separate bathroom.
- Keep your distance from other family members and pets.
- Do not share personal goods such as cups, towels, or cutlery.
- If possible, wear a mask when around other people.[93]

TRACING CONTACTS
- Contact tracing is important for reducing the spread of COVID-19 and protecting yourself, your family, and your community.
- COVID-19 distribution is slowed via contact tracking.

- Contact tracing protects you, your family, and your community by doing the following:
- Informing people that they may have been exposed to COVID-19 and that they should check their health for COVID-19 signs and symptoms.
- Assisting those who may have been exposed to COVID-19 in obtaining a COVID-19 test.
- Instructing people to self-isolate or self-quarantine if they have COVID-19 and are in close contact.
- The health department workers will not ask you for the following information during contact tracing:
- Money
- Your Social Security number.
- Your bank account number
- Information on salaries
- Credit card information

COVID-19 contact tracing is most effective when combined with routine preventive measures.You can delay the spread of COVID-19 by taking simple precautions every day. Until a vaccination or better therapies become widely available, this is extremely critical. If you have been vaccinated against COVID-19, you should follow existing CDC recommendations on when and how long to self-isolate if you have the virus, or self-quarantine if you are a close contact, at this time. The Centers for Disease Control and Prevention (CDC) continues to keep a close eye on the latest scientific findings.[94]

CONCLUSIONS

This review sheds light on the current state of COVID-19, presenting a snapshot of the current state of knowledge in terms of public health implications, pathophysiology, and symptoms.diagnosis, effects on body, treatment and emergency response, there is a fast-expanding body of knowledge. There is a lot of literature on this subject, and maybe it will aid in the development of an efficient vaccination and the best practice symptomatic situations management and treatment Only once the epidemic is over will we be able to analyze the health, social, and economic consequences of this worldwide calamity, and we should be able to draw lessons for future pandemics, particularly in terms of public and global health.

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