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Special Issue COVID-19

Analysis of COVID-19 Pandemic through Narrative Literature Review

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Abstract

COVID-19 pandemic is in its early stages and it is almost impossible to predict its future impact. The ongoing COVID-19 pandemic has alarmed the global community to the sudden outbreaks of viruses. This literature review is meant to provide historical context and current implications of ongoing COVID-19 pandemic on the global community and healthcare resources. It aims to present a review of various accredited studies about SARS-CoV-2, clinical presentation, point-of-care tests, disease course, and public health interventions. The composite collection of subtopics on COVID-19 within this review will enable its readers to focus on the current status and management of this global pandemic. Further well-focused, robust research and clinical trials are imperative to help us understand the mechanisms of disease transmission, incubation period, the exact duration of infectivity, the clinical course of the disease, molecular diagnostics, therapeutic strategies, and disease surveillance.

Keywords: COVID-19 outbreak, Coronavirus, Pneumonia, ARDS, Diagnosis, Infection, Prevention, Pandemic

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Introduction and Background

On March 11, 2020, the COVID-19 virus was officially announced as a pandemic by WHO after affecting 114 countries in three months. The current Pandemic has severely affected medical resources, health systems, and the global economy. The scale and spread of this disease will determine its true impact as time goes on. COVID-19 is believed to be caused by a spill-over of an animal coronavirus to humans who later acquired the ability to initiate human-to-human transmission. The virus responsible for causing COVID-19 is known as SARS-CoV-2, a beta coronavirus out of four genera of coronaviruses. Disease manifestations include asymptomatic, paucisymptomatic, and symptomatic presentation. The majority of infected individuals develop mild illness whereas, approximately 14% of patients with severe illness require admission in hospital and oxygen support and 5% of patients need treatment in an intensive care unit.[1] Mostly symptomatic individuals report symptoms such as cough, fever, and sometimes dyspnoea. There is a high predilection for individuals at old age, those with chronic illnesses and immunocompromised conditions.[2] Fulminant disease manifests itself with severe pneumonia, acute respiratory distress syndrome (ARDS), sepsis, and multiorgan failure.[3,4] Several clinical trials have been initiated to investigate potential therapies for COVID-19[5] and to develop a safe and effective vaccine.

This public health emergency has enormous impacts on local health care systems and economic policies across the world. It is testing time for all countries to identify various gaps in achieving emergency preparedness and interventions to respond timely and efficaciously. This narrative literature review aims to provide the historical context of previous major outbreaks, salient clinical features, and implications of the ongoing COVID-19 pandemic on the global community and healthcare resources. It must be emphasized that this information is based on the findings and conclusions made by various initial reports and currently available data. However, further studies are imperative to help us understand the mode of transmission, incubation period, disease course, and the exact duration of infectivity.

COVID-19 is spreading rapidly across the globe since its recent discovery in Wuhan, China.[5] It has been documented as the fifth pandemic since the 1918 Spanish flu pandemic. Currently, there are no effective therapies or vaccines available.[6] Comprehensive multidisciplinary collaboration, among clinicians, nurses, pharmacists, and caregivers from other disciplines, plays an important role in the integrated care of the infected population.[3]

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Communities need to protect their vulnerable population including those with old age and people with greater mortality risk. It is high time for developing evidence-based clinical practice guidelines that should serve as complete guidance for health professionals to provide an optimized standard of care at this time of health emergency.[3]

World health authorities are putting efforts to contain a shock wave caused by this pandemic which has recently hit the geographic regions of northern Italy, Spain, France, Germany, the United Kingdom, USA, and many others. Many of these affected countries have already strengthened their virological research programs and surveillance systems to control community, inter- and intra-familial, and nosocomial spread of this infectious disease.[7] The composite collection of subtopics on COVID-19 within this review should enable its readers to understand the historical context of previous major outbreaks, salient clinical features of COVID-19, public health interventions, and mitigation strategies and the impact of COVID-19 pandemic on health resources and global community.

Historical Perspectives of Other Major Outbreaks

Throughout human history, we learn about many pandemics afflicting various civilizations and killing large percentages of the population around the world. The earliest known outbreak occurred in 430 BC during the Peloponnesian War. Infectious diseases such as influenza, smallpox, malaria, tuberculosis, leprosy, and others are just a few that affected mankind. Some of the most momentous outbreaks that altered the course of human history include “Plague of Justinian” (541-542 AD, with recurrences until 750), “Black Death” (1346-1353 CE), “Smallpox” (around 3rd-century B.C.E- Last death in 1978), “Cholera pandemic “ (1817-1824), “Flu pandemic (1889-1890), “H1N1 Spanish Flu (1918-1920), “H2N2 Asian flu” (1957-1958), “H3N2 Hong Kong Flu” (1968-1970), “HIV/AIDS” (1981-present), “SARS” (2002-2004), “H1N1 Swine Flu pandemic” (2009 - 2010), “MERS” (2012-present) “West African Ebola epidemic” (2014- 2016), “Zika virus epidemic” (2015-present), and “COVID-19” (2019 - present). Effects like significant social disruption and toll of the previous pandemics can help us understand the possible impacts of the COVID-19 pandemic that has recently emerged.

The **1918 Spanish flu (H1N1 virus) epidemic** was the deadliest flu affecting approximately one-third of the population around the world in 1918. Despite the medical advancements over the last hundred years, the potential for another severe pandemic in the future remains the same.[8] Three waves of influenza pandemic occurred between 1918 to 1919, as suggested by epidemiologic data and few anecdotal reports.[9] Seasonal influenza epidemics were peculiar due to the U-shaped mortality curve, mostly affecting the very young and the very old population. However, the 1918 influenza disease pandemic was characterized by the W-

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shaped mortality curve, with large numbers of deaths of young adults.[10] It was a time when healthcare systems faced challenges like lack of critical care measures and unavailability of mechanical ventilation.[11] Therefore, healthcare professionals were left with limited treatment options besides supportive care.[12]

The global community has been subjected to three more Flu pandemics since 1918, including the H2N2 virus Flu pandemic in 1957, H3N2 Virus Flu pandemic in 1968, and H1N1pdm09 virus Swine flu pandemic in 2009.[13]

Severe acute respiratory syndrome (SARS) is caused by a coronavirus called SARS-associated coronavirus (SARS-CoV). It was first reported in 2002 in China, subsequently spreading to many countries across the globe.[14] World Health Organization (WHO) mentions a total of 8,098 people across the globe who acquired SARS during this outbreak, and of these, 774 died.

Middle East Respiratory Syndrome (MERS) is caused by a coronavirus called Middle East Respiratory Syndrome Coronavirus (MERS-CoV). MERS-CoV was first reported in Saudi Arabia in 2012,[15] subsequently spreading to the region including countries in the Middle East, Europe, Asia, and the United States.[16,17]It was later known that the first case occurred in April 2012 in Jordan. WHO reported a case-fatality rate of 34.4% globally at the end of November 2019.

Ebola virus disease (EVD) was identified in the Democratic Republic of Congo in 1976. Since then, it has periodically recurred over the last 44 years and infected people in several African countries. During West Africa's 2014 to 2015 outbreak, it was observed that most cases were caused through intrafamilial transmission and exposure to dead bodies infected with EVD.[18] Measures taken for changing social behaviors and practices for safe burial within the local community was critical in controlling the Ebola epidemic,[19] and reducing the disease transmission.

Examining the events in various other outbreaks in the past and using that knowledge to learn various aspects of the ongoing pandemic, the question is, "are we more prepared for a pandemic like COVID-19, with the possible impact of the pathogen that has emerged for which no vaccine or approved treatment is available at this crucial time".

Salient Features of COVID-19 Pandemic

Coronaviruses belong to a large family of viruses, which are mostly carried through animal reservoirs such as bats, camels, pigs, and cats. Sometimes these viruses infect humans through a spill-over event to cause disease. The illness usually ranges from common flu to

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upper reparatory tract infection of variable severity. Three new coronaviruses naming SARS-CoV-2, MERS-CoV, and SARS-CoV are known to have their origin from bats. Intermediate host between bats and humans is thought to be civets in case of SARS-CoV and camels in case of MERS-CoV. Contact with overcrowded wild livestock animals within wet markets, along with insufficient biosecurity control measures, is thought to cause such spill-over events transmitting these coronaviruses from animals to human.[20]

Coronavirus disease 2019 (COVID-19) is caused by a single-stranded RNA virus belonging to the betaCoVs category of coronaviruses.[5] This novel coronavirus (2019-nCoV has crown-like appearance when viewed under an electron microscope, each with a diameter of 60–140 nm approximately. The following are some of the important features of this novel coronavirus and COVID-19 disease caused by it.

SARS-CoV-2 Stability

Scientists from U.S NIH, Centers for Disease Control and Prevention, University of California Los Angeles, and Princeton University were able to find SARS-CoV-2 stable for several hours to days in aerosols as well as on various surfaces. According to findings by scientists which were published in *The New England Journal of Medicine*,[21] SARS-CoV-2 was found to be detectable on:

- Aerosols for up to 3 hours
- Copper for up to 4 hours
- Cardboard for up to 24 hours
- Plastic and stainless steel for up to 2 to 3 days

This information suggests that people can be at risk of acquiring the novel coronavirus infection through the air or if a person touches the contaminated surfaces or objects.[21] The contents of this research were placed in a preprint server for sharing data with researchers around the world.

Transmission

Scientists are trying to find out about the exact mode of transmission of the virus to humans.[22] Initial CoVID-19 cases were identified with having direct exposure in Huanan Seafood Wholesale Market which is located in Wuhan city of Hubei province in China. It was then presumed that this infection was transmitted from animals to humans. However, subsequent cases were known to be transmitted from human to human.[23] COVID-19 is thought to be transmitted through respiratory droplets including infected saliva, mucus, and

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nasal secretions of an infected person.[7] A person can become infected if he/she inhales such infectious droplets or comes in contact with infected surfaces or objects when they touch their nose, eyes, or mouth. SARS-CoV-2 RNA is found in upper and lower respiratory tract specimens in addition to blood and stool specimens of an infected person. It is currently unknown whether non-respiratory body fluids of an infected person, such as urine, seminal fluid, vaginal secretions, vomitus, and breast milk, have infectious SARS-CoV-2. Symptomatic cases of COVID-19 are frequent sources of transmitting infection but there are suggestions that it can be transmitted from an infected individual without having any symptoms of the disease.[7]

Signs and Symptoms

Infected people may have symptoms of COVID-19 disease such as fever, cough, sore throat, difficulty breathing, chills, headache, muscle pain, and repeated shaking with chills.[6,24]The incubation period for this disease is thought to be up to 14 days. The median time from exposure to the development of symptoms is 4 to 5 days, as stated by U.S CDC. COVID-19 disease can present itself as a mild illness, but the severe disease has also been reported. An infected individual may develop warning signs (red flag symptoms) such as severe breathlessness, chest pain/pressure, confusion, drowsiness, cyanosis, and other concerning symptoms such as significantly reduced urine output or hemoptysis.[4] Emerging evidence reports features like diarrhea,[4] nasal congestion, and itchy eyes.[25] Risk factors for developing a severe form of the disease include people with old age (65 Years and older) and people of any age who are immunocompromised or with comorbidities including chronic renal disease necessitating dialysis, chronic lung disease, liver disease, moderate to severe asthma, cardiac disease with complications, severe obesity and diabetes. The disease shows a high predilection for people living in crowded conditions.[2] There is currently no known difference between clinical presentation between pregnant and non-pregnant women.[3] Because of the limited data, researchers are still focused on gathering information about clinical manifestations of COVID-19 in the special population such as children, pregnant and breastfeeding women, along with the perinatal outcome.[3] Although there is no clear disease association with adverse maternal or neonatal outcomes in the third trimester of pregnancy, there are cases which reported preterm birth, fetal distress and prelabor rupture of membranes.[3]

Role of Cytokine Storm Syndrome

Scientific evidence suggests some patients with severe COVID-19 might have been affected by cytokine storm syndrome which may lead to multiorgan failure. It is essential to identify and address hyper inflammation caused by SARS-CoV-2 using approved and safe therapeutic strategies with proven efficacy, to reduce the rising mortality.[26] Respiratory failure which is

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caused by acute respiratory distress syndrome (ARDS) is believed to be the main cause of increased mortality in patients who are severely affected by COVID-19. Research points out the importance of evaluation tests (eg, high ferritin level, low platelet counts, high C-reactive protein, and high erythrocyte sedimentation rate) to identify hyper inflammation in patients with severe COVID-19. HScore can also help in identifying those patients who need immunosuppression and such a strategy may improve mortality in these case scenarios.[26]

Another important finding observed ARDS and acute lung injury was attributed to rapid replication of the virus, massive infiltration of inflammatory cells, and elevated production of proinflammatory chemokines and cytokines in patients with severe pneumonia. Recent data involving animal experiments suggest the role of virus-mediated immunopathology in causing fatal pneumonia after human coronavirus infections. Repercussions of cytokine storm and dysregulated immune response causing lung immunopathology, and thus deleterious clinical manifestations, are important for understanding the pathophysiology and virulence mechanisms of pathogenic human coronavirus infections.[27]

Diagnostic Testing

The first clinical sample identified to contain this virus was reported on 7 January 2020, as stated by WHO. Various diagnostic tools were subsequently developed within a short frame. It is recommended to collect specimen samples from the upper respiratory tract through a nasopharyngeal swab for diagnostic testing. The specimen can be collected using sputum if a person has developed a productive cough. However, it is not recommended to induce sputum in patients without a productive cough.[28] SARS-CoV-2 viral RNA can be readily detected in a specimen taken from nasopharynx compared to the specimen from the throat. According to the United States CDC guidance, a specimen that is collected from the lower respiratory tract, such as in a patient with invasive mechanical ventilation, may have better yield compared to the specimen obtained from the upper respiratory tract.

Specimens should be collected once a **Persons Under Investigation** (PUI) is identified irrespective of time from onset of symptoms.[28] Healthcare personnel should adhere to standard operating procedures (SOPs) and must be trained to follow the procedure for obtaining and saving the specimen for testing.[29] Laboratories should comply with strict biosafety practices and follow national reporting requirements. Specific WHO interim guidance has already been published.

Diagnostic testing to identify confirmed COVID-19 cases is critical to track the virus.[29] It is extremely important to isolate confirmed cases and track their contacts.[30] Such contact tracing may help in understanding epidemiology and suppression of disease transmission

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inside the community. WHO recommends PCR testing of individuals, with or without symptoms, who have had a history of contact with a confirmed COVID-19 case. The case definitions are regularly updated by the World Health Organization.[29] Nucleic acid amplification tests (NAAT), such as RT-PCR can be utilized to screen suspected individuals.

Validated serological surveys such as Rapid IgM and IgG antibody testing can help to identify the acute and convalescent-phase in confirmed COVID-19 cases, and it can aid in understanding the full spectrum of disease retrospectively.[29] As reported by numerous studies, cross-reactivity to other coronaviruses can be challenging. Some studies and reviews about the performance of serological diagnostic assays for MERS-CoV and SARS-CoV-2 have already been published.[30–32] Rapid and accurate **point-of-care tests** can be very especially useful and may lead to a marked improvement in early detection followed by isolation of infected individuals and contact tracing.[7] U.S CDS mentions on its website, the "priorities" for testing a suspected person for having COVID-19 disease.[33]

Clinical Spectrum and Further Work-Up

The clinical spectrum of this illness is variable. Individuals infected with this virus can be asymptomatic, paucisymptomatic, or symptomatic. Symptomatic individuals may develop mild, moderate, or severe illness. Signs and symptoms include fever, dry cough, productive cough (less frequently), fatigue, anorexia, dyspnea, myalgias, respiratory distress, tachypnea, and hypoxia.[6,24] However, as fever can be moderate or even absent even in severe forms of the disease,[34] fever symptoms must be interpreted carefully particularly in older patients with comorbidities. Less common manifestations (<10%) include headache, confused state, hemoptysis, vomiting, runny nose, sore throat, and diarrhea. Extra-pulmonary symptoms such as diarrhea can be a challenging finding.[4] There are anecdotal reports of patients reporting with olfactory and taste disorders such as anosmia or ageusia before respiratory symptoms. It has been reported, children experience similar signs and symptoms of COVID-19 as adults but those are usually milder. Children with severe pneumonia may have cyanosis. Whether to monitor an infected person on an inpatient or outpatient basis, depends on clinical presentation, presence of risk factors for developing severe disease, and need for supportive care in the hospital. Pregnant women with confirmed COVID-19 should be essentially managed through a multidisciplinary team approach with collaboration of obstetric, perinatal, pediatric and intensive care specialists.[3]

As depicted in a research study,[23] patients with COVID-19 from China presented with illness ranging from mild to critical severity i.e., 81% with mild to moderate disease severity, 14% with severe disease, and 5% with the critical disease. Also, this study pointed out a 2.3%

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overall case fatality rate and a 49% case fatality rate in patients with the critical disease.[23] The long-term consequences of COVID-19 are yet to be known. Patients with critical disease presented with respiratory failure, shock, or multiorgan system dysfunction.

Laboratory workup for COVID-19 commonly demonstrates decreased lymphocyte count. Lymphopenia and elevated D-dimer appear to be a negative prognostic factor.[34] Increased values of liver enzymes, LDH, ferritin levels, C-reactive protein as well as neutrophilia can be associated with greater severity of illness. Procalcitonin value can be normal initially but may increase in COVID-19 patients in ICU. Critical patients are reported to have increased D-dimer value, persistently decreased blood lymphocytes, and laboratory evaluation test results indicating multiorgan imbalance (For example, high amylase and tests indicating coagulation disorders).[34] Increased levels of plasma inflammatory markers in patients with critical illness suggest potential immune dysregulation.

Although patients may have unremarkable findings on chest radiographs in the early course of the disease, bilateral air-space consolidation is typically demonstrated on chest radiographs of COVID-19 cases whereas, chest Computed Tomography (CT) images typically demonstrate bilateral, peripheral ground-glass opacities.[3] The diagnostic value of chest CT in COVID-19 may be low due to the non-specific pattern and CT images findings may overlap with other infections as well. The decision to use chest CT scans for diagnosis or management of COVID-19 patients should be based on the assessment as American College of Radiology (ACR) recommends avoiding using Computed Tomography for screening purposes of COVID-19 or as a first-line test for purpose of diagnosing COVID-19. However, it allows performing CT in hospitalized symptomatic patients having specific clinical indications for CT.[35]

Patients with the potential of developing severe illness should be monitored closely particularly in the second week of developing symptoms. Patients with severe disease may require hospitalization for management. Health care professionals must be vigilant about impending complications such as severe pneumonia, ARDS, hypoxemic respiratory failure, septic shock,[3] cardiomyopathy and arrhythmia,[6] acute lung injury, acute kidney injury, and risks associated with prolonged hospitalization such as thromboembolism, gastrointestinal bleeding, secondary bacterial infections, and critical illness. Inpatient management involves supportive care such as oxygen therapy. Respiratory failure necessitating mechanical ventilation and supportive care in an intensive care need a multidisciplinary approach for patient's management. Severe or critical COVID-19 cases are at risk of developing septic shock and multiple organ dysfunction syndromes.[34] Depending on the clinical manifestations of the disease by severity, Chest CT scans may show pneumonia with abnormal findings in a

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subgroup of affected patients and/or ground-glass opacities. In patients with ARDS, chest imaging such as chest radiograph, CT scan, or lung ultrasound demonstrate bilateral opacities (lung infiltrates > 50%).[34] In cases with pulmonary edema, the primary respiratory origin of the edema is proven after the exclusion of cardiac failure or other causes such as fluid overload.[34] Echocardiography can be helpful for this purpose.

Overall case fatality of 0.9% was reported in patients in China with no underlying medical conditions, but case fatality was higher for patients with comorbidities such as 10.5% for patients with cardiovascular disease, 7.3% for patients with diabetes, and approximately 6% each for the hypertensive patient, patient with chronic respiratory disease and patient with cancer. Increased severity of disease and adverse outcomes have been associated with cardiac disease, previous history of stroke, hypertension, diabetes, chronic lung, and renal disease.[3]

Therapeutic Efforts for COVID-19

To date, no specific treatment or vaccine is approved for COVID-19.[5] Treatment is mainly symptomatic at present, and people infected with severe disease are mainly managed through oxygen therapy.[34] Mechanical ventilation is mainly reserved to manage patients with respiratory failure who are not responding to oxygen therapy whereas patients with septic shock are managed through hemodynamic support.[34] Clinicians should ensure early and effective metabolic control of glucose and lipid levels and optimal management of high blood pressure for all diabetic and hypertensive COVID-19 patients[36] as recent research suggests a direct link between metabolic and endocrine-related effects and COVID-19 pathogenesis.

Researchers are working with various health authorities to conduct various research programs for calculating disease risk assessment, diagnostic modalities, and clinical trials to find an appropriate, effective, and safe therapeutic option to cure the disease. Current research has been focused on developing novel therapeutics[37] such as antivirals and vaccines across the globe.[26] For this purpose, various repurposed drugs, as well as investigational drugs, have been identified and efforts are being made to identify novel agents. Investigational agents require evaluation through randomized, controlled trials. Clinical trials and research involving remdesivir, favipiravir,[38] Lopinavir/ritonavir with or without interferon, chloroquine, Hydroxychloroquine with or without azithromycin, sarilumab, tocilizumab, interferons, convalescent plasma and sera, immunotherapies, other investigational therapies, and interventions are planned and/or under-way in many countries independently and through collaborative efforts, such as in United States, Canada, China, and France, Australasia, Europe, and countries in Southeast Asia.

China has already announced the first animal tests to prepare a vaccine for COVID-19. Similarly, researchers from the University of Queensland in Australia have also reported their

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proceeding to animal testing after completion of three weeks in vitro study.[34] Furthermore, the National Institute for Allergy and Infectious Diseases (NIAID) of the United States has already declared the beginning of the clinical trial of 2019-nCoV Vaccine for Prophylaxis COVID-19. World Health Organization is concerned about vaccine safety due to the experience such as intensification of disease caused by inactivated whole virus vaccine. Likewise, SARS coronavirus vaccines showed similar reports in animal testing.

To date, therapeutic strategies for COVID-19 are supportive only therefore, it is crucial to mitigate the disease by adopting stringent prevention measures to interrupt or minimize disease transmission. Such mitigation strategies are fundamentally important for surveillance to diagnose patients followed by immediate isolation as well as quick contact tracing followed by quarantining traced contacts.[39] For countries with imported COVID-19 cases, WHO gives its recommendations globally for activating immediate response management protocols to control COVID-19 at the national level. Also, it has guided strategic preparedness and response plan for countries to tackle COVID-19 Pandemic.[40]

Role of Mitigation Strategies

Because no specific drugs or vaccines are currently available,[5] it is suggested that isolation[6] and quarantine of individuals after being exposed to an infected person, are the best strategies to mitigate this disease. Most of the countries affected with this pandemic are taking unprecedented measures and community mitigation strategies including travel restriction, social distancing measures,[41] suspension of events, congregations and social mass gatherings[41] with the super-spread potential of disease, closure of school and universities to avoid direct and close person to person contact at the community level, postponing various ad hoc events,[42] institutional and home quarantining of people after contact tracing, strategies to minimize crowd size, funeral services with safety measures and prevention protocol, close collaboration between various health authorities on a national and international level to combat the disease, strategic efforts to improve the availability of medical supplies and community sensitization to adopt restricted movement. Countries are trying their best to make optimal use of available tools for implementing strategies and interventions to mitigate the disease. For example, China has been successful to reduce the number of infected cases through implementing strict isolation measures.

Another mitigation strategy to reduce the spread is to encourage people to frequently wash their hands for at least 20 seconds with soap and water and urge people to use alcohol-based hand rub with greater than 60% ethanol or 70% isopropanol as active ingredients.[35] It is

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advised to avoid touching face and mouth after having contact with potentially contaminated surfaces or objects. Scientists are still learning about how it spreads, the associated risk factors, and severity of illness along with management. Many uncertainties remain about the virus-host interaction. At present, the vaccine is still not available for prevention; therefore it is extremely important to avoid any sort of exposure to this virus.[6]

Although the origin of SARS-CoV-2 is not entirely understood, the virus seems to evolve from a certain strain that is found in bats. Key areas of investigation have drawn attention to know about the virus origin and mutations, pathogenesis, therapeutic strategies, and development of a vaccine.[43] Potential intermediate host, between bats and humans for COVID-19 transmission, is yet to be known, and researchers are not certain whether such host truly exists.[34] However, recently polygenetic analyses have supported the possible role of pangolin acting as a natural host of betacoronavirus, with the potential to transmit the disease to humans.[44] SARS-CoV-2 appears to be very contagious and a highly communicable respiratory virus and its spread aren't anywhere near finished across the globe. Researchers have emphasized to develop necessary policies for emerging zoonotic diseases.[45]

Conclusion

This review has briefly summarized the salient clinical features of COVID-19, and its impact on health resources and the global community. At the time of this writing, the content of this review is based on the currently available data. COVID-19 causes respiratory infection with variable clinical presentation ranging from a mild common cold-like illness to severe pneumonia and potentially fatal acute respiratory distress syndrome. Most patients with mild illness are managed through supportive management and implementing self-isolation. Medical emergency interventions including hospital admission depend on the severity of illness, and the presence of red flag symptoms, multimorbidity, and other risk factors. Like many other threatening infectious diseases in the past, COVID-19 is rapidly spreading through a chain of community transmission. Early detection, isolation of infected cases, and effective contact tracing of vulnerable individuals are a few important strategies that seem effective in breaking this chain of human transmission. Research studies should be conducted to analyze the exact efficacy of these mitigation measures being implemented to control the spread. Also, it is high time to consider developing the necessary health-related policies for emerging zoonotic infectious diseases to prevent the occurrence of such outbreaks in the future.

As COVID-19 has intensified, different countries have adopted various health practices and travel-related quarantine guidelines, and are imposing various travel restrictions to prevent disease transmission locally and globally. Epidemiologic prevention and control measures should be in place until preventive medical interventions such as vaccine development and targeted therapeutic management strategies become available and are officially approved. Improvement in global disease surveillance, molecular diagnostics, vaccines, therapeutic strategies, infection control measures, intensive care, and related medical equipment, such as mechanical ventilators are still warranted. Well-focused, robust research and clinical trials are needed to find out effective strategies for diagnosis, management, and prevention of COVID-19.

Conflict of interest statement:

The author reports no conflicts of interest in this work.

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