

Chronology of COVID-19 Pandemic – the Un-flatten Curve

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Abstract: The COVID-19 pandemic gripped 193 countries including certain territories, though the disease started in Wuhan city China on 17th November 2019 as pneumonia of unknown origin linked to its seafood market, the China health authorities reported it as on 31st December 2019. The coronavirus responsible for the disease is a novel stain observed in human is a spill-over from animals seems to be bats with 96% genomic resemblance indicative of an intermediary host a mammal till not known. Initially, it has considered as human-to-human transmission of infection through contact, later hypothesizing the spread through aerosol infection also. The uncertainty with the disease has little compared with past influenza as if conditions but most of the things associates with this are unpredictable. Now, more than 2 million cases found positive with 2.5 lac cases of death around the world still it is on with meagre recovery rate. The course diseases and its management become a big task for the entire globe. The entire globe is finding the solutions with historical observations and experience, including the use of antiviral, antibiotics, and anti-malarial drugs and plasma convalescent therapy beyond these placenta proteins cells, and mesenchymal stem cell therapy are being under exploration as effective means in the management of COVID-19.

Key words: Chronology of COVID-19; Pandemic; Influenza like conditions; Unflatten Curve.

1. Introduction

The COVID-19 infection is a pandemic caused by a novel coronavirus a new strain of the virus in humans belongs to the beta coronavirus family; basically, it affects the lungs and causes severe acute respiratory symptoms, and the virus hosts ACE2 receptors in the lungs and other parts of the body including kidney [1,2]. The first confirmed case was date back to 17th November 2019, and reported by the China National Health commission to WHO as 31st December, 2019[3]. Initially the infection was thought to be transmitted from Wuhan seafood-wet market in China, later learned that human to human contact and cluster transmission is reported, moreover, hypothesizing that aerosol infection may likely to be possible among the peoples closely associated with the infected person including health care workers(HCE)[4]. The symptoms of COVID-19 may range from mild, moderate to severe; around 86 percent of cases usually reported moderate symptoms of fever, dry cough, sore throat and diarrhoea, and among severely infected cases respiratory and multi-organ failure[5]. Then incubation period was assumed to be 14 days, later found it as 27 days with the viability of virus for five weeks[6]. The management of infection with the antiviral and antibiotic not proved to be effective[7]. As of 21st April 2020, globally there have been 2397216 confirmed cases with 162956 deaths with COVID-19, out of this America reported the highest number of cases 751273 followed by Spain (200210), Italy (181228), Germany (143457), France (113513), the United Kingdom (124747), Turkey (90980), and Iran (83505), and the fatality reported in orderly higher in France (113513 with 17.82%), followed by United Kingdom (16509 with 13.23%), Italy (24114 with 13.31%), Spain ((200210 with 10.01%) Iran (5209 with 6.24%), America (35884 with 4.78%), Germany (4598 with 3.21%), and Turkey (2140 with 2.35%) with meagre recovery rates[8]. This paper is an effort to update and order the events of this infection-related to chronology.

1.1. Chronology of COVID-19:

On 8th December 2019, the first patient with the onset of symptoms of pneumonia has reported by WHO[9]. The epidemic Severe Acute Respiratory Infection (Pneumonia like) was observed from December 12th, 2019 in Wuhan city of China[10]. According to Daniel Lucey, Georgetown University the first reported case emerged on 1st December 2019; it is possible that the initial human infection took place in November 2019 if not earlier[11,12]. On 12th December 2019, Wuhan Municipal Health Commission (WMHC) reported cases of unexplained pneumonia with the recent history of exposure to wildlife animals at the Huanan Seafood Wholesale Market in Wuhan, China, where many wild animals such as hedgehog, badger, snake, poultry, bats, birds, and other farm animals were also sold for human consumption [13].

On 26th December 2019, four more cases of unidentified pneumonia were linked to the Huanan, Southern China Seafood Wholesale Market, Wuhan city, Hubei province of Central China, and were picked up by local healthcare facilities running the surveillance program for 'pneumonia of unknown aetiology'[14,15].

On 30th December 2019, the Wuhan municipal health service sent out an alert that a cluster of 27 cases of pneumonia of unknown origin with 7 severe cases reported from Wuhan of Hubei provinces in central China to its National Health Commission (WHO) [16,17].

Health care workers notice a pattern of illness they had never seen before among the population, common symptoms include fever, body aches, tiredness, and difficulty breathing [18,19]. Dr. Li Wenliang an ophthalmologist at Wuhan Central Hospital one of the health facilities at the epicenter of the epidemic sent a message to a group of fellow doctors warning them about the seven severe cases as the possible outbreak of an illness that resembled severe acute respiratory syndrome (SARS) in Wuhan, Hubei province, China, he encouraged them to protect themselves from infection [20, 21, 22].

On 31st December 2019 the Peoples Republic China under its obligations for International Health Regulations (2005), [23] reported to the World Health Organization (WHO) China bureau in Beijing 27 cases with pneumonia of unknown aetiology had taken place, out of which 7 cases are severely ill and the remaining are stable, with the clinical features common to several infectious respiratory diseases such as fever, dyspnoea, and bilateral lung infiltrates on chest radiographs[24, 25].

Soon, the disease spread rapidly within and outside the Hubei Province and engulfed a large number of countries initially to Thailand, Japan, and the Republic of Korea[26]. The Outbreaks and clusters of the disease have since been observed in Asia, Europe, Australia, Africa, and the Americas[27,28].

Since the cause was unknown at the onset of these emerging infections, the diagnosis of pneumonia of unknown cause was based on clinical characteristics, chest imaging, and the ruling out of common bacterial and viral pathogens that cause pneumonia[29]. Suspected cases were isolated using airborne precautions in the designated hospital, Jin Yintan Hospital (Wuhan, China)[30].

Chines health authorities placed all suspected cases of Wuhan under isolation at Jin Yintan Hospital and initiated contact tracing activities and applied hygiene and environmental sanitation activities at the market, which was closed to the public **on 1st January 2020** [31,32,33,34].

Preliminary investigations suggested a diagnosis of viral pneumonia and reported no significant human-to-human transmission and no cases among healthcare workers[35,36].

On 2 January 2020, the incident management system was activated across the three levels of WHO (country office, regional office, and headquarters) by the WHO [37, 38].

On 5th January 2020, an additional of 32 cases of pneumonia reported in Wuhan city with dates of onset falls from **12th – 29th December 2019**, raising the total number of reported pneumonia cases of unknown aetiology to 59 [39,40]. Samples of Broncho-alveolar lavage fluid (BALF) from the patients with severe pneumonia was sent to Wuhan Institute of Virology (WIV) for the diagnosis of the causative pathogen [41, 42].

On 7th January 2020, Zheng-Li Shi a Chinese scientist and virologist of Wuhan Institute of Virology based on the meta-genomic RNA sequencing of a sample of Broncho-alveolar lavage fluid from the patient identified a new RNA virus strain and named it as 'novel coronavirus [43].

The genomic sequence of the virus was 96% identical to that of a Severe Acute Respiratory Syndrome coronavirus (SARS-CoV) identified in horseshoe bats in Yunnan. Zhou et al. found that the genome sequence results suggested that bat species might be a host i.e., the natural reservoir of SARS-CoV [44].

On 8th January 2020, first confirm case is reported in Thailand [45].

On 9th January 2020, the Chinese Centre for Disease Control and Prevention (CDC) ruled out SARS-Cov and MERS-CoV and confirmed that a novel coronavirus (2019-nCoV) had been detected as the causative agent of pneumonia [46, 47].

On 10th January 2020, the novel coronavirus genome sequence was made publicly available by the Shanghai Public Health Clinical Centre & School of Public Health, in collaboration with the Central Hospital of Wuhan, Huazhong University of Science and Technology, the Wuhan Centre for Disease Control and Prevention, the National Institute for Communicable Disease Control and Prevention, the Chinese Centre for Disease Control, and the University of Sydney, Australia [48, 49]. The sequence was deposited in the Gene Bank database (accession number MN908947), and was uploaded to the Global Initiative on Sharing all Influenza Data (GISAID). Preliminary analysis showed that the novel coronavirus clusters with the SARS-related CoV clade and differs from the core genome of known bat CoV [50, 51].

Preliminary analyses indicate that 2019-nCoV has some amino acid homology to SARS-CoV and may be able to use ACE2 as a receptor. This has important implications for predicting pandemic potential moving forward [52].

On 11th January 2020, China has reported a first fatal case of the novel coronavirus [53].

On 12th January 2020, Novel coronavirus (2019-nCoV) was named temporarily by the WHO [54, 55]. On 13th January 2020, first confirmed case is reported in Nepal [56] and on 14th January in Japan [57].

On 15 January 2020, WHO Developed the surveillance case definitions for human infection with 2019-nCoV and the Ministry of Health, Labour and Welfare, Japan (MHLW) reported an imported case of laboratory-confirmed 2019-novel coronavirus (2019-nCoV) from Wuhan, Hubei Province, China [58].

On 17th January 2020, WHO published an updated of the interim guidelines for the laboratory testing of a novel coronavirus, 2019 [59]. Up to 17th January 2020, 44 laboratory-confirmed cases of viral pneumonia have been reported, with the onset of symptoms ranged from 8th December 2019 to 5th January 2020 [60].

On 19th January 2020, first confirmed case is reported in the Republic of Korea [61] and on **20th January 2020** in USA. The coronavirus infection has classified as fortifiable infectious diseases in China [62]. Furthermore, *The Lancet*—recently documented infections in health-care workers caring for patients with 2019-nCoV indicate human-to-human transmission and thus the risk of a much wider spread of the disease [63].

On 21st January 2020, WHO reported 314 confirmed cases of novel coronavirus (2019-nCoV) globally; out of these deaths of 6 cases from Wuhan; and 16 infected case health care workers (HCW) [64].

On 22th & 23rd January 2020 WHO called for the 1st emergency meeting, and later declared that the infection in health care workers (HCWs) caring 2019-nCoV patients were reported and the same is being confirmed by China as human to human transmission of the virus (WHO) [65]. It is also supported by the article published in NEJM that the human to human transmission of 2019-nCoV was demonstrated [66].

A Familial Cluster of Infection Associated With the 2019 Novel Coronavirus Indicating Possible Person-to-Person Transmission during the Incubation Period [67]. **On 23rd January 2020**, first confirm case is reported in Singapore[68] and WHO reported 25% of confirmed cases are severely and critically ill as classified by the Chinese health authorities[69] The initial source of infection remains unknown. However, the outbreak is no longer due to the exposures at the Huanan seafood market in Wuhan. There is now more evidence that the spread of infection is from human- to- human, moreover, family clusters involving persons with no reported travel to Wuhan[70].

On 24th January 2020, first confirm case are reported in France and Vietnam, and China published the first clinical data from individuals confirmed to be infected with 2019-nCoV from Wuhan, China [71]. Chaolin Huang and colleagues provide comprehensive findings for the first 41 laboratory confirmed cases, 27 of these 41 cases had direct exposure to the Wuhan seafood market that has thought to be the initial site of infection from an animal source [72]. All had viral pneumonia, the severity of illness is concerning: almost a third of patients developed acute respiratory distress syndrome requiring intensive care; six patients died; five had an acute cardiac injury, and four required ventilation [73].

First confirmed cases of COVID-19 infection are reported during January, 2020 in countries like Australia and Malaysia on 25th January,[72] Canada on 26th January[75], Cambodia and Sri Lanka on 27th January[76] Germany on 28th January[77], UAE, Finland and Italy on 29th January[78].

On 30th January 2020, WHO in its 2nd emergency meeting declared that the outbreak of 2019-nCoV infection has become Public Health Emergency of International Concern (PHEIC), [79] and first confirmed case are reported in India and Philippines[80]. In India the first confirm case was reported from Kerala state, with two more subsequent cases reported, all the three cases had recent travel history from Chinas Wuhan city[81].

On 31st January 2020 first confirmed is case reported in Russia Federation, Spain, Sweden and UK [82]

On 1st February 2020, WHO published by PAHO laboratory guidelines for detection and diagnosis of the novel coronavirus, 2019 [83]. A cluster of Indexed cases on Princess Diamond cruise ship have been confirmed in Hong Kong with SARI cases [84].

On 2nd February 2020 first fatal case was reported outside China (WHO) [85].

On 4th February 2020 first confirmed case was reported in Belgium [86].

On 11th February 2020, an International Committee on Taxonomy of Viruses (ICTV) WHO declared that the 2019-nCoV was officially names as “Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) [87]. This name was chosen because the virus is genetically related to the coronavirus responsible for the SARS outbreak of 2003 [88]. The pneumonia infected with 2019-nCoV was officially named as COVID-19 by WHO [89, 90].

On 15th February 2020, first confirmed case reported in Egypt, on 20th February in Iran, on 22nd February in Lebanon and Israel, on 24th February in Kuwait [91], on 25th February in Afghanistan, Bahrain, Oman, and Iraq, on 26th February in Austria, Switzerland, Algeria and Croatia, on 27th February in Brazil, Denmark, Estonia, Georgia, Greece, Norway, Pakistan, Romania, and North Macedonia, on 28th February in Belarus, Netherlands, New Zealand, and Nigeria, on 29th February in Mexico, and San Marino [92]. COVID-19 stands for

coronavirus diseases of 2019 and is a respiratory infection caused by the novel coronavirus SARS-CoV-2 [93]. The term novel coronavirus means that a new type of coronavirus that has crown-like spikes around it. Here corona stands for crown in latin [94].

Coronaviruses (CoVs) are enveloped non-segmented positive-sense RNA viruses, which are of roughly 30 kb genome surrounded by protein belonging to the family *Coronaviridae* and the order *Nidovirales*, and are broadly distributed in humans and other mammals [95]. First discovered in domestic poultry in 1965s and causes a range of respiratory, gastrointestinal, hepatic, and neurologic diseases in animal, Scientists first discovered that CoV originate among bats following the outbreak of Severe Acute Respiratory Syndrome (SARS) in 2003 [96]. CoV are zoonotic viruses- that can spill-over from animals to humans [97]. As the coronavirus family grows, different strains simultaneously co-infect individual bats, turning their little bodies into virus blenders, creating new strains of every sort, some more powerful than others [98].

This process happens without making bats sick—a phenomenon that scientists have linked to bats' singular ability, among mammals, to fly [99]. The feat takes a severe toll, such that their immune systems have evolved a better way to repair cell damage and to fight off viruses without provoking further inflammation [100]. But when these viruses leap into a new species— whether a pangolin or a civet or a human—the result can be severe, sometimes deadly, sickness [101].

In 2013 Shi Zheng-Li sequenced a coronavirus found in bats, which, in January, she discovered shares 96% of its genome with SARS-CoV-2 [102]. The two viruses have a common ancestor that dates back 30 to 50 years, but the absence of a perfect match suggests that further mutation took place in other bat colonies, and then in an intermediate host [103]. Analyses of the SARS-CoV-2 genome indicate a single spill-over an event, meaning the virus jumped only once from an animal to a human, which makes it likely that the virus was circulating among people before December 2019 [104].

Researchers from South China Agricultural University declared the intermediate host of SARS-CoV-2 could be the Chinese pangolin (*Manis pentadactyla*) although this has not been confirmed at this date [105].

The new coronavirus is an elusive killer since people have never seen this strain before; there is much about it remains mystery [106]. Till date seven coronaviruses are known to cause disease in humans; four cause symptoms of the common cold are 229E, OC43, NL63, and HUK1, and the other three cause more serious lung infections including pneumonia are SARS-CoV (Severe Acute Respiratory Syndrome (SARS) and MERS-CoV in 2012 (Middle East Respiratory Syndrome or MERS) and SARS-CoV-2 (the current pandemic known as COVID-19) [107].

The SARS-CoV-2 is a genus Beta-coronavirus, subgenus Sarbecovirus belonging to the family of *Coronaviridae* [108]. Essentially a zoonotic disease, the first human coronavirus outbreak was recorded in 1965 - HCoV-229E, followed by two outbreaks of similar capacity - SARS-CoV and MERS-CoV in 2003 and 2012, respectively [109,110].

On 1st March 2020, first confirmed case is reported in Ireland, Monaco, Qatar, Azerbaijan, Ecuador, On 2nd March in Armenia, Czechia, Dominica Republic Luxembourg, Iceland, and Indonesia, On 3rd March in Andorra, Jordan, Latimia, Morocco, Portugal, Saudi Arabia, Senegal, and Tunisia, on 4th March in Argentina, Chile, Poland, and Ukraine, on 5th March in Bosnia, Herzegovina, Gibraltar, Hungary, Slovenia, Palestinian territory, on 6th March on Bhutan, Cameroon, Serbia, and South Africa, on 7th March in Colombia, Holy see, Peru, and Togo, on 8th March in Bulgaria, Costa Rica, Faroe Islands, French, Guiana, Maldives, Malta, Martinique, and Republic of Moldova, on 9th March in Bangladesh, Albania, and Paraguay and on 10th March in Brunei Darussalam, Mongolia, Cyprus, and Guernsey, Panama [111, 112].

On 11th March 2020 WHO declared COVID-19 as global pandemic as the virus and the disease spread worldwide and first confirm case is reported in Bolivia, Tamika, Burkina Faso Democratic Republic of Congo [111, 112].

On 12th March, 2020 first confirmed case reported in French Polynesia, Turkey, Honduras, Cote D' Ivories [111, 112].

On 13th March, 2020 WHO updated interim guidelines for laboratory testing for coronavirus in suspected human cases (WHO)., first confirm case is reported in Guyana, Grenadines [111, 112].

On 14th March first confirmed case is reported in Lithuania, Liechtenstein, Puerto Rico Venezuela, Antigua, and Barbuda, on 15th March in Cayman Island, Ethiopia, Gabon, Ghana, Guinea, Kenya, Kazakhstan, Curacao, Namibia, Central African Reuchlin, Congo, Equatorial Guinea, Eswatini, Mauritania, Mayotte, on 16th March in Uzbekistan, Uruguay, Rwanda, Seychelles, and Montenegro, on 17th March in Guam Somalia, Bahamas, Aruba, United States Virgin Island Benin, and the United Republic of Tanzania, on 19th March in Kyrgyzstan, Djibouti, Barbados, Montserrat, Mauritius, Zambia, and the Gambia, on 20th March in Fiji, New Caledonia, El Salvador, Nicaragua, Chad, and Niger, on 21st March in Papua New Guinea, Isle of Man, Timor-Leste, Haiti, and Cabo Verde, Zimbabwe, on 22nd March in Madagascar, Angola, Eritrea, and Uganda, on 23rd March in

Syrian Arab, Republic Grenada, and Mozambique, on 24th March in Myanmar, Belize Dominica, Turks, and Caicos Island, on 25th March in Lao people's Democratic Republic, Libya, on 26th March in Saint Kitts and Nevis, Guinea-Bissau's, on 27th March in Anguilla, British Virgin Islands, on 29th March in the Commonwealth of the Northern Mariana Islands [111, 112].

On 1st April 2020, first confirmed case was reported in Botswana, Burundi, and Sierra Leone, on 3rd April in Malawi, on 4th April in Bonaire, Sint Eustatius Saba, on 5th April in Falkland Islands (Malvinas), on 6th April in South Sudan, on 7th April in Sao Tome and Principe, on 8th April in Saint Pierre and Miquelon, on 11th April in Yemen [111, 112].

1.2. SARS-CoV-2 Natural / Laboratory created:

Some folks claim that the new coronavirus causing the pandemic was man-made or engineered in a lab and deliberately released to make people sick [113]. It is currently impossible to prove or disprove the theories of its origin [114]. However, since we observed the result of genomic features might explain in part the infectiousness and transmissibility of SARS-CoV-2 in humans and it discredits that this novel coronavirus arose naturally [115,116].

China blaming as the US army may have brought the virus to Wuhan: China [117]. Luc Montagnier a Noble Laureate and French virologist has claimed that SARS-CoV-2 is man-made virus and as an industrial accident was said to have taken place in the Wuhan National Biosafety laboratory that specializes in these coronaviruses since the early 2000s [118].

2. Incubation Period:

The incubation period was 27 days [119,120,121].

3. Transmission of infection:

COVID-19 virus is primarily transmitted between people through respiratory droplets and contact routes (primarily contact with an infected person, or indirectly with surfaces in the immediate environments i.e., fomites (objects used on by the infected person). Initially, airborne transmission was not considered as mean for infection [122]. But, the possibility of transmission can't be ruled out under specific circumstances and settings in which procedures or support treatments that generate aerosols are performed; i.e., endotracheal intubation, bronchoscopy, open suctioning, administration of nebulized treatment, manual ventilation before intubation, turning the patient to the prone position, disconnecting the patient from the ventilator, non-invasive positive-pressure ventilation, tracheostomy, and cardiopulmonary resuscitation [123]. Current research supports the possibility of spread of infection through bio-aerosols generated directly by patients' exhalation, they are referring to fine particles emitted when someone breathes that can be suspended in the air [124].

According to Linsey Marr, an aerosol scientist at Virginia Tech the health experts so far less paid importance to the possibility of transmitting covid19 infection through the air, "I think that transmission by inhalation of the virus in the air is happening, Scientists Probe How Coronavirus Might Travel Through The Air, National Research Council 2020 [125].

Since the study indicates that the aerosol and fomite transmission of SARS-CoV-2 is plausible since the virus can remain viable and infectious in aerosols for hours and on surfaces up to days (depending on the inoculum shed) [126, 127]. SARS-CoV-2 are viable and detected up to 72 hours (3 days) on the surfaces with a median half-life of approximately 1.1 to 1.2 hours, and the longevity of viability was stable on plastic and stainless steel than on copper and cardboard [128].

4. Clinical presentation of COVID-19

However, COVID-19 is a respiratory illness that primarily affects lungs, and researchers reported that the virus is also damaging the Brain, heart, kidneys, intestinal tract and liver [129,130,131]. The range of organs impacted by the virus makes the progression of the disease unpredictable and further complicates the recovery process [132, 133].

About 80-85% of patients suffer from mild or moderate symptoms, 15-20% of cases experience severe [134,135]. Usually it can take up to six weeks to fully recover from COVID-19, experts say, and even months in some severe cases [136,137].

The most common symptoms manifested are Fever, Fatigue, Dry cough, Anorexia, Myalgia, Dyspnoea, Sputum, and Sore throat, [138,139,140] Uncommon symptoms are-Confusion, Dizziness, Headache, Running nose, Haemoptysis, Foot sores, Impairment of Renal function otherwise renal failure, Myocarditis, arrhythmia, cardiac arrest, Pulmonary embolism, respiratory failure, Loss of smell and taste (olfactory and gustatory sense), Conjunctivitis, Intestinal infection leads to pain abdomen, diarrhoea and vomiting, Acute inflammation of the liver [141,142,143,144].

5. Placentas cell therapy for COVID19

On 7th April 2020, according to Yaky Yanay the CEO and President of Pluristem Therapeutics Company Haifa Israel, so far they have treated 7 cases of COVID19 from Israel, and one is under treatment from America with 15-milliliter inter muscular doses of placentas protein known as PLacental eXpanded(PLX) cells [145,146]. All seven Israelis patients had survived and three soon move off ventilators, while one had shown deterioration in respiratory parameters [147]. Two of the four Israelis with multiple organ failure showed clinical recovery as well as respiratory improvement. The firm had obtained approval on a patient-by-patient basis from the regulators [148]. Researchers around the world are studying the efficacy of mesenchymal stem cell-based products and therapy, around 10 patients in China were tested and 7 shows improvement in COVID-19 infection [149].

As the whole world puts up a collective fight against the COVID-19 pandemic, some worrying news has cropped up from across Asia-patients who tested negative of the disease are being infected with the SARS-CoV-2 virus again. Such cases had been reported from South Korea, China and Japan. Researchers from China addressed the possibility of reinfection by conducting experiments on rhesus monkeys. After 28 days, they found that the oral and anal swabs of monkeys did not show the presence of the virus. Researchers at the School of Basic Medical Sciences, Fudan University, Shanghai studied blood samples from patients who had been released after treatment and found that nearly a third had low levels of antibodies. In some patients, the antibodies could not be detected at all. The titres (concentration) of antibodies varied according to age. Older patients had more antibodies than the younger ones. The study was published in medRxiv on March 30, 2020 and has not been peer-reviewed. This could mean that if the real virus cannot induce an antibody response, the weakened version used in a vaccine may not work. South Korea's Centre for Disease Control (CDC) claimed the virus reactivated in some patients. It said it would study this further.

"The most likely explanation is that people have simmering virus replication for an unusually long time and this can occasionally result in late reactivation. Most available data stated that the length of virus detection varies from person to person, so it isn't surprising that some people might continue to produce the virus and get sick," says Dave O' Connor, professor at the Department of Pathology and Laboratory Medicine, University of Wisconsin-Madison [150]. The latest news by Italian scientists on 06 May 2020, who claimed to have developed vaccine that neutralises coronavirus in human cells. As per tests conducted at Rome's infectious-disease Spallanzani Hospital, the coronavirus vaccine has antibodies generated in mice that work on human cells. All of the vaccine candidates currently being developed are based on the genetic material of DNA protein 'spike' [151]. Scientists from the University of Texas (UT) at Austin, the National Institutes of Health and Ghent University in Belgium developed a treatment that links two nanobodies isolated from a llama to create an antibody that binds to the spike protein on the coronavirus that causes COVID-19. That bond prevented the virus from invading cells, the researchers reported in the journal *Cell* [152]. The journal *Science* on April 26 reported on a clinical trial in which critically ill Covid-19 patients at Northwell Health in the New York City area were receiving nine times the heartburn dose. Interim results from 391 patients could be known in "a few weeks," according to a hospital researcher [153].

Conclusion

The coronavirus infection is a global threat, still uncertain about its intermediary host and hypothesizing different means of transmission of infection including clusters. The new strain of virus and non-availability of treatment and severely ill and critically ill case management becomes a challenge and novel interventions are under trials. As the pandemic is progressing and the number of deaths is high and recovery is negligible, hence the circumstances prevail compulsory for social distancing and lockdowns.

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