

OVERVIEW OF COVID-19 AND WAY FORWARD

SUMMARY

COVID-19 pandemic is currently ravaging the world. Its consequences have brought undue pressure to the economy, humanity and its environments. The World Health Organization has declared it as a global health concern; hence, the need for holistic approach to curtail it admits the wait for the development of therapeutic vaccine and drugs. The objective of this review is to summarize the current research and knowledge on the origin, conspiracy theories, transmission, pathogenesis, clinical manifestations of the virus and to provide guidance on the importance of strict compliance to personal preventive hygienic measures, in other to reduce the transmission risks. Nations of the world and concerned international organization should encourage and fund researches to prevent emergence or re-emergence of another pandemic in the future.

Keywords: COVID-19, pandemic, origin, transmission, personal preventive measures.

INTRODUCTION

COVID-19 is known to cause diseases and several infections in humans. COVID-19, caused by SARS-CoV2 endangers global health, economy and social security of mankind. It is responsible for respiratory and gastro-enteric disorder. It is not only limited to a localized region in the human organs; targeted tissues include: the nervous system, immune system, reproductive system, digestive system and in severe or critical stage, they migrate to systemic infections resulting to death in humans [2]. The new novel strain of coronavirus was reported after an outbreak in Wuhan, China, in 2019, and it was named as COVID-19. The word COVID-19 is an abbreviation of the word coronavirus disease -2019. 'CO' stands for 'corona,' 'VI' for 'virus,' and 'D' for 'disease' and '19' stands for the year '2019'. [2, 12, 13, 16].

What are Coronaviruses ?

Taxonomically, Coronaviruses are the largest group of viruses belonging to the order *Nidovirales* and the family *Coronaviridae*. The family *Coronaviridae* comprises of two sub families namely the *Coronavirinae* and *Torovirinae*. The *coronavirinae* are further subdivided into four genera, the Alpha, Beta, Gamma and Delta corona viruses. Covid-19 are enveloped, non-segmented, positive-sense and single-stranded RNA viruses [6]. They are characterized by club-like spike that project from their surface, a large RNA genome, and unique replication strategy. It is named after the wreath- shaped protrusions on the envelope of the virus. This group of virus is of zoonotic origin [3, 7, 16].

Emergence and Conspiracy Theories of SARS- CoV-2 (COVID-19)

In November 2002, the novel strain of corona virus was reported in China after it was mistakenly referred to as a new influenza virus recombinant. It was recognized as the etiology of “atypical pneumonia” manifested by respiratory disorder symptoms like: sore throat, dry cough, fatigue, dyspnea, pneumonia, fever and headache. It was later named ‘Severe Acute Respiratory Syndrome’ (SARS). The index case of SARS was first reported in Foshan city, Guangdong Province, China, where three people became severely ill and over five fatalities were recorded. In February, 2003, the world was aware of the lung disease, shortly before it escaped China, when one of the doctors who had been treating patients had a travelling history to Hong Kong became severely ill, died and transmitted it to other 29 countries [5, 27, 37, 38, 39]. World Health Organization reported that the confirmed cases of the infection were 8096 in July, 2003 [37, 30]. There were 373 possible SARS cases in the United States, however, SARS-CoV2 identification was confirmed in only 8 of them. Seven of the eight cases confirmed were likely due to exposure during international travels, and the eighth case was probably due to exposure to

person to person transmission. In 2004, the second outbreaks were recorded with only 4 infections and with no fatality or further transmission [24]. The genome sequence of SARS-CoV2 strain provides an explanation for the sudden apparent disappearance of the disease for a while [16, 7]. The World Health Organization (WHO) reported that the novel coronavirus affected the lower respiratory tract of patients with pneumonia in Wuhan, China on 29 December, 2019 [28, 29, 35, 38].

In recent time, as the phrase goes, the 'streets are talking' and 'rumor mills are running'. Several skeptics and tin foil hat bearers have been speculating, some of the most spine-chilling, eerie and conspiracy theories include the claim that the corona virus is an offensive biological weapon with DNA-genetic engineering, however the claim is unsubstantiated. Claims that the virus is a partisan invention or part of a plot to re-engineer the population also lacks scientific basis. Scientist also refuted that the idea of a connection between Covid-19 and 5G is complete rubbish and lack scientific evidence [1].

Epidemiological Characteristic of Covid-19

On 29 December, 2019, the initial symptom of Covid-19 confirmed patients was traced to the first four cases of an acute respiratory syndrome of unknown etiology which were reported in Wuhan City, Hubei Province, China among people linked to a local seafood market. Serious global concern of Covid-19 pandemic has created instability to human kind and its environment. This includes fear of confirmed cases, stigmatization, increasing death rate, increasing levels of stress, anxiety and psychological imbalance among the quarantined and isolated people. Some previous researches focused mainly on Wuhan, China as the epicenter of Covid-19's epidemiological and clinical features, but other regions were not mentioned. Clinical symptoms are similar but the epidemiology can differ from one region to another [22, 23, 29, 31, 36, 38,39].

Transmission of Covid-19

Many domestic and wild animals, including camels, cattle, cats, and bats, may serve as reservoir hosts for coronaviruses. However, there are exceptions, such as SARS and MERS, which are mainly spread through close contact with infected people through respiratory droplets from coughing or sneezing. COVID-19 early patients were reported to have some link to the Huanan Seafood Market in Wuhan, China, suggesting that these early infections were due to animal-to-person transmission [21, 22, 37,38]. The three main transmission routes for the COVID-19 include droplets transmission, contact transmission, and aerosol transmission. Droplets transmission occurs when respiratory droplets (as produced when an infected person coughs or sneezes) are ingested or inhaled by individuals in close proximity. Contact transmission occurs when a subject touches a surface or object contaminated with the virus and subsequently touches their mouth, nose, or eyes. Aerosol transmission occurs when respiratory droplets mix into the air, forming aerosols, and causing infections while inhaling a high dose of aerosols into the lungs in a relatively closed environment [37, 38]. Recent studies indicated that the digestive system serve as a potential transmission route for COVID-19 infection through faecal contamination [2, 10, 28] Some patients had gastro intestinal discomfort and diarrhea symptoms, researchers analyzed four datasets with single-cell transcriptomes of digestive systems and found that ACE2 was highly expressed in absorptive enterocytes from the small intestine (ileum) and large intestine (colon). The SARS virus is transmitted aerogenically with an incubation time of 2 to 14 days with a mean of 5 days [2, 10, 26, 29, 31].

Clinical Manifestation and Pathogenesis

Covid-19 is known to be associated with enteric, lung and respiratory diseases in humans [21]. Pneumonia caused by SARS Covid-19 is characterized by diffused edema resulting in hypoxia.

The form of the disease depends on a host of factors which includes: Immune status, age and presence of other co-morbidities, such as diabetes, hypertension, heart disease, cancer, chronic lung disease and other underlying ailment disorders. The binding of the virus to angiotensin-converting enzyme-2 (Recently, the receptor involved in the entry of the SARS virus into the cell was reported to be the angiotensin-converting enzyme 2 (ACE2) on the surface of respiratory tract epithelium which may contribute to the dysregulation of fluid balance that causes the edema in the alveolar space. Significantly high blood levels of cytokines and chemokines are noted in patients with COVID-19 infection [4, 11, 14 28, 30, 33, 36, 37, 38, 39]. The association of worsening clinical progression with declining viral loads and the onset of an immunological response, plus the presence of markedly elevated cytokines levels suggest that severe lung damages are largely immunopathological in nature. The maximum incubation period is assumed to be up to 14 days, whereas the median time from onset of symptoms to intensive care unit (ICU) admission is around 10 days. Clinical findings of the virus have been identified in respiratory tract specimens of 1–2 days before the onset of symptoms, and it can persist up to 8 days in moderate cases and up to 2 weeks in severe cases [2, 4, 14, 15, 22, 28].

Clinical Sign and Symptom

The most commonly reported symptoms include: chest pain, fever, dry cough, myalgia or fatigue and other respiratory issues. Other symptoms include: repeated shaking with chill, headache, sore throat, diarrhea, hemoptysis, vomiting, runny nose and loss of sense of taste or smell. In patients with some underlying disease, the disease tends to develop rapidly into acute respiratory distress syndrome, septic shock, metabolic acidosis, which are hard to correct and coagulation dysfunction, ultimately leading to death. The following procedures have been suggested for diagnosis for patient who shows infection symptoms and clinical signs, they

include; performing real-time fluorescence (RT-PCR) to detect the positive nucleic acid of SARS-CoV-2 in sputum, throat swabs, and secretions of the lower respiratory tract samples [10, 22, 12, 13, 29, 30]. China reported that young people were more likely to have milder cases of the disease. The coronavirus infection requiring hospitalizations are not only possible in younger adults but the rate of these cases is higher now that the virus is spreading across the world. In the United States, it seemed that the corona virus was mostly a threat to the elderly and those with underlying health. It was reported that people that were hospitalized for Covid-19 in the United States, of these, 38% were between 20 and 54 years old. Half of those ending in intensive care were younger than 65. Officials in Europe are noting the same trend, with report that half of the serious cases in France and Netherland are in people under age of 50. In addition to endangering their own health, more coronavirus infections among young adults could mean more risk to older people, who are still the group mostly likely to die. Approximately 80% of deaths are in people older than 65. In Africa, the demographic factors and lack of proper regional approach limit the number of recorded cases. Middle-aged and elderly patients with pre-existing ailment and diseases such as cancer surgery, cirrhosis, hypertension, heart diseases, diabetes, and Parkinson's disease are prone to increasing death rate. However, patients with no pre-existing conditions are also found to be suffering from severe symptoms and even death [2, 10, 21, 22, 30].

Prevention and Control

Several public health measures that may prevent or slow down the emerging transmission of Covid-19 have been brought to light, and they include specific control measures such as containment and quarantine and these have been implemented. There is currently no specific antiviral or vaccine treatment to protect against COVID-19. The best way is to ensure preventive and precautionary measures to prevent the infectious viral diseases. People with COVID-19 must

seek medical care to help relieve symptoms. Regarding infected patients with COVID-19, it has been recommended to apply appropriate symptomatic treatment and supportive care. Medical staff, veterinary staff and other personnel dealing with humans and animals infected with high risk viruses must take precautions to protect themselves and to avoid spreading the infection [17, 18, 19, 20, 32, 33]. Precautions and recommendations by the World Health Organization to curtail COVID-19 include;

- When sneezing or coughing, do not cover nose and mouth with bare hands but use a tissue or a mask instead and then throw in trash after use
- . Wash your hands properly and frequently with alcohol based sanitizer or soap. Washing of hands should be done often with soap and water for at least 20 seconds, especially after going to the bathroom; before eating, and after blowing your nose, coughing, or sneezing. Even if there are viruses present on hands, washing hands can block the viruses from entering respiratory tract through nose or mouth. Avoid touching your eyes, nose, and mouth with unwashed hands.
- Be sure to wear the mask used correctly. Just in case you come in contact with an infected person, wearing a mask can prevent you from inhaling virus-carrying droplets directly.
- Social distancing should be inculcated.
- Boosting your immunity is also an important way to strengthen the body against the virus. Maintain a balanced diet, ensure adequate nutrition, maintain oral health hygiene, exercise regularly and have a regular sleep schedule, quit smoking, limit alcohol consumption, stay in good spirit and ensure indoor ventilation.

- 2019-nCoV is mainly transmitted by droplets and contacts, therefore medical surgical masks must be worn properly, avoid irresponsible or inappropriate antimicrobial treatment, especially in combination with broad-spectrum antimicrobials.
- Stigmatization hurts everyone by creating more fear or anger towards ordinary people, instead of the disease that is causing the problem. We can fight stigma and help not to hurt others by providing social support. [2, 6, 9, 10, 15, 24,27, 29, 31,33,39].
- Stay safe and healthy

Conclusion

Over the years, the emergence of many pandemic have, caused a wide variety of human and veterinary diseases. COVID-19 will continue to emerge and to evolve causing human pandemic outbreaks owing to their ability to recombine, mutate, changing their genetic configuration infecting multiple species and cell types. Future research on COVID-19 will continue to investigate many aspects of viral replication and pathogenesis, transmission, therapeutic vaccine, zoonotic origin, immunity host range and their pathogenesis. These studies should lead to a large increase in the number of suitable awareness on COVID-19.

Finally, defining the mechanism of action on how COVID-19 causes diseases and understanding the host immunopathological response will significantly improve our ability to design suitable vaccines and reduce disease burden globally. Government agencies, medical stakeholders and world leaders should incorporated recent scientific research into public policies at the community, regional, and national levels to curtail, and prevent the further spread of the deadly COVID-19 pandemic beyond health consequences.

Recommendations

Nations of the world and concerned international organization should encourage and fund researches to prevent emergence of another pandemic in the future. New guidelines should be issued by World Health Organization to all airport authorities and airlines in the world to mitigate and prevent the spread of COVID-19 and other emerging fast spreading disease to all nooks and crannies of the world.

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