Minireview Article

OVERVIEW OF COVID-19 AND WAY FORWARD

Abstract

COVID-19 pandemic is currently ravaging the world, its consequences has brought undue pressure to economy, humanity and its environments. The World Health Organization has declared it a Public Health Emergency of International Concern, hence the need for holistic approach to curtail it. The objective of the review is to summarize the current research and knowledge on viral origin, conspiracy theories, transmission, pathogenesis, clinical manifestation and to provide guidance on personal preventive measures to reduce the transmission risks. Nations of the world and concern international organization should encourage and fund researches to prevent emergence of another pandemic in the future.

Keywords: COVID-19, Pandemic, origin, transmission, personal preventive measures

INTRODUCTION

COVID-19, caused by infection with SARS-CoV-2, is a human disease …Covid-19 is known to cause diseases and several infections in human, other animals, mammals and birds. They endanger global health, economy and social security. (CoVs) are responsible for respiratory, enteric disorder. As a group, they are not limited to a localized region in organs; targeted tissue includes nervous system, immune system, reproductive system, digestive system and in latent stage migrates to systemic infections [23]. The new strain of Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was identified at the end of 2019 causing the infectious disease which was named as COVID-19, abbreviated as COVID-19. In COVID-19, 'CO' stands for 'corona,' 'VI' for 'virus,' and 'D' for disease and 19 for 2019 [11, 24].

Comment [KL1]: Covid-19 is the disease caused by SARS-CoV2

Comment [KL2]: The pathogen SARS-Cov-2 was found in some animals but that does not mean disease. Infected animals could be reservoir.

Comment [KL3]: Specify?

Comment [KL4]: Stands for?

What are Corona Viruses?

Taxonomically, Coronaviruses (CoVs) is the largest group of viruses belonging to the order *Nidovirales* and the family *Coronaviridae*. The family *Coronaviridae* comprise 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. Corona viruses are enveloped, non-segmented, positive-sense and single-stranded RNA viruses [3]. 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, 13].

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

In November 2002, the new corona virus emerged in China after originally being mistakenly as a new influenza virus recombinant, was identified as the etiology of ("atypical pneumonia") marked by respiratory symptoms, cough, dyspnea, pneumonia, fever and headache. It was later named Severe Acute Respiratory Syndrome (SARS). The first case of SARS was recorded in Foshan city, Guangdong Province, China, where three people became ill and over five deaths were recorded. The world was alerted about the lung disease in February, 2003, shortly before it escaped China, when one of the doctor who had been treating patients had a travelling history to Hong Kong became ill and died and transmitted it to other 29 countries [31, 12]. By July 2003, 8096 confirmed cases of the infection were reported by World Health Organization [31, 26]. There were 373 possible SARS case in the United State~~:~~ s however, SARS- CoV identification has been confirmed in only 8 of them. Seven of the eight cases were likely due to exposure during international travel, and the eight cases were probably due to exposure to one of the other person. The second outbreaks were recorded in 2004, with only 4 infections with no mortality or

further transmission [20]. The genome sequence of SARS-CoV strain provides an explanation for the sudden apparent disappearance of the disease for a while. [13]. The World Health Organization (WHO) used the term 2019 corona virus to refer to a corona virus that affected the lower respiratory tract of patient with pneumonia in Wuham, China on 29 December 2019 [21]. The WHO announced that the official name of the 2019 novel corona virus is corona virus disease (COVID-19) and the current reference name for the virus is severe acute respiratory syndrome corona virus 2 (SARS- CoV-2) [4, 5, 24, 32]. As the phrase goes, the 'streets are talking' and rumor mills are running overtime. 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 biologically impossible [1].

Epidemiological Characteristic of Pandemic Covid-19

On 29 December 2019, the initial symptom onset of COVID-19 confirmed patients had been 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 create instability to human kind and its environment, this includes fear of confirmed case, increasing death rate, levels of stress, anxiety and psychological imbalance development among the quarantined people. Some previous research published COVID-19's epidemiological and clinical features focused mainly on Wuhan, China, but other regions were not mentioned. Clinical symptoms are similar but the epidemiology can differ from one region to another [2, 10].

Transmission of Covid-19

Many domestic and wild animals, including camels, cattle, cats, and bats, may serve as reservoir hosts for coronaviruses considered that, generally, animal corona viruses do not spread among Humans. However, there are exceptions, such as SARS and MERS, which are mainly spread though close contact with infected people through respiratory droplets from cough 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 [8]. 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 cause infection while inhaling a high dose of aerosols into the lungs in a relatively closed environment. Recent study indicated that the digestive system as a potential transmission route for COVID-19 infection through faecal contamination (reference?). 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, 22, 19].

Clinical Manifestation and Pathogenesis

COVID-19 are known to be associated with enteric and respiratory diseases (e.g., diarrhea), in addition to respiratory disease, they are also associated with diarrhea and serious lung disease in humans [22]. Covid-19 infection always target respiratory system causing severe pneumonia, RNA anemia, combined with the incidence of acute cardiac injury. Pneumonia caused by SARS Covid-19 is characterized by diffuse edema resulting in hypoxia. The form of the disease one develops depends on a host of factors including: Immune status, age and presence of other co-morbidities, such as diabetes, hypertension, heart disease, cancer, chronic lung disease, 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 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 [19]. The association of worsening clinical progression with declining virus loads and the onset of an immunological response, plus the presence of markedly elevated cytokines levels suggest that severe lung damage is largely immunopathological in nature. The most dramatic demonstration that coronaviruses can have a wide host range was provided by SARSCoV-2?. 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 finding of the virus has been identified in respiratory tract specimens 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, 7,19].

Clinical Sign and Symptom

The most commonly reported symptoms include: chest pain, fever, dry cough, myalgia or fatigue, difficulty in breathing, Respiratory issues. Other symptoms include: repeated shaking

Comment [KL5]: A study showed that in patients with severe clinical features of COVID-19 infection, the proportion of patients with acute pulmonary embolus was 23% (95% CI: 15%, 33%) on pulmonary CT angiography (Grillet at al, 2019)

with chill, headache, aches and pains, sore throat, diarrhea, hemoptysis, ~~chest pain~~, vomiting, runny nose and new loss of taste or smell. In patients with some underlying disease, the infection 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 [2, 19, 24, 26].

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 [19, 2, 4, 24, 26].

Comment [KL6]: More details is needed about Covid-19 impact by age group as it was previously assumed that teenagers seems to be less clinically affected than adult

Prevention and Control

Several public health measures that may prevent or slow down the transmission of the COVID-19 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 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 infection [14, 15, 16, 17]. Precautions and recommendations by the World Health Organization to curtail COVID-19 include;

Comment [KL7]: That emerging disease has brought to light some specific control measures such as containment and quarantine. You should have insisted on that.

- When sneezing or coughing, do not cover nose and mouth with bare hands but use a tissue or a mask instead. Wash your hands properly and frequently with alcohol base 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 always 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. Boost your immunity. Avoid going to crowded and enclosed places. Boosting your immunity is the most important way to avoid being infected. Exercise more and have a regular sleep schedule. Maintain a balanced diet, ensuring adequate nutrition, and maintaining oral health can help prevent against infection. Exercise regularly to boost immunity. Quit smoking, limit alcohol consumption, and stay in good spirits. 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.
- Cover your cough or sneeze with a tissue, then throw the tissue in the trash. 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 hurt others by providing social support [18, 25, 26, 27, 28, 29, 30, 31IFRC, UNICEF, WHO, 2020) Stay safe and healthy (IPC, 2019 ; WHO, 2020; GENOVA WHO 2020; Ong et al., 2020 interim 2019)

Comment [KL8]: I would like the authors to insist on total containment and quarantine as measures that have been put in place

Conclusion

Over the years, the emergence of many different coronaviruses that cause a wide variety of human and veterinary diseases has occurred. COVID-19 will continue to emerge and to evolve causing human pandemic outbreaks owing to their ability to recombine, mutate, and infect 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 cause disease and understanding the host immunopathological response will signifi cantly improve our ability to design suitable vaccines and reduce disease burden globally. Government agencies should incorporated recent scientific research into public policies at the community, regional, and national levels to curtail, and/or prevent the further spread of the COVID-19 beyond health consequences.

Recommendations

Nations of the world and concern 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 newly emerging fast spreading disease to all parts of the world.

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