

Depicting Coronavirus Disease 2019 (COVID-19) through a Medical Lens

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Abstract—*The beginning of the COVID-19 pandemic started in December 2019 when the China Health Authority informed the World Health Organisation (WHO) regarding some cases of pneumonia of unknown aetiology in Wuhan City in Hubei province in China. As of now, many lives have been lost and the number of active case infection of COVID-19 continues to rise. The purpose of this piece of content is to provide a succinct overview of the scenario of COVID-19 pandemic and its surrounding issues. The methodology of this article is based on content analysis and literature review where the author mostly analysed a substantial amount of secondary literature to depict the COVID-19 pandemic all over the world. The author reviewed the literature critically to summarise the current knowledge and understanding about COVID-19, present situation of the pandemic as well as transmission, management and prevention measures of this pandemic.*

Introduction

COVID-19 is an international announced global pandemic [red]. Through the announcement of the World Health Organisation (WHO) and the China Health Authority (CHA), the world has come to know about an unknown type of pneumonia in Wuhan City of China at the end of December 2019 [8]. It was argued that the first cases of this ailment were identified among individuals who were employed or resided around the Huanan Seafood Wholesale Market in Wuhan [15]. In January, a novel coronavirus was diagnosed from the swab sample of the patients and this was abbreviated as 2019-nCov by WHO [11]. These patients had symptoms such as dry cough, fever, radiological findings showed bilateral lung glassy opacities [12]. Later, this virus was renamed as 'severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) [8], and WHO further claimed that this infectious virus should be called as coronavirus disease 2019 (COVID-19). The current situation of COVID-19 has caught the utmost attention of the scientific world, especially in the arena of medicine. the World Health Organisation announced the outbreak as a public health concern as well as a pandemic to alert the world's populations on 11 March 2020 [12]. Many countries have taken strict and efficient measures to deal with this pandemic. Some have succeeded and some are yet struggling to control this

outbreak. This paper will depict the present situation of the COVID-19 pandemic. Furthermore, some other major facets that are covered in this article are pathogenesis and immune response, diagnosis, the causative agent, epidemiology, treatment and management, and control and preventive approaches.

Background of COVID-19

Coronaviridae and order *Nidovirales* is the umbrella family of SARS-CoV2, and this family has two branches such as *Torovirinae* and *Coronavirinae*. These branches are also categorized into four types: a) Betacoronavirus, b) Alphacoronavirus, c) Deltacoronavirus, and d) Gammacoronavirus [4]. COVID-19 belongs to Betacoronavirus along with a couple of strong pathogenic viruses: MERS-CoV and SARS-CoV; SARS-CoV-2 is a positive-sense and single-stranded RNA virus [13]. It is also deemed as a Betacoronavirus that can infect humans easily [16]. Scientific analysis indicated that COVID-19 is highly related to two bat-emerged viruses identified in China in 2018 [27]. It is also found that this virus was more connected to BatCoV RaTG13, a bat coronavirus that was found in *Rhinolophus affinis* that had 96.2 per cent genome sequence identity [27]. Also, another piece of evidence suggests a remixture of events in SARS-CoV2's genome with other viruses emerging from bats including RaTG13, BatCoV, SARs-CoVs, and SARS-CoV [27]. There are several causes argued to justify that only animal is responsible for the transmission to the human body [8]. Firstly, there were other types of animals available for purchase in Huanan Seafood Wholesale Market except for bats; secondly, evidence indicates that the close relatives of SARS-CoV2 have a big branch to suggest that those viruses may not be called as direct ancestors of SARS-CoV2; and thirdly, while other animals are taken as immediate host, bats are the natural reservoir of such as SARS-CoV [27, 10]. Hence, it is clear there that there is still more research needed to claim a solid proof to understand this virus properly as all the pieces of evidence are still being argued and rechecked.

Vulnerable groups

The most vulnerable people who can be most affected by COVID-19 infection are the persons who have diabetes and cardiovascular ailments [6]. The people who are at their older age and adult men are relatively more affected by the COVID-19 infection than younger people and adult women respectively; there is also evidence that children who are less than 15 years old are less likely to be affected by COVID-19 [9,5,22,2].

How it spreads?

The proof and arguments being how this virus was transmitted in the first place are still contentious [8]. Although some people claimed that the virus was transmitted from the seafood market [14], there is other strong evidence that suggests that the first human transmission might have happened earlier than December 2019 from a different place [26]. It is believed that this virus is contagious and can be transmitted through cough or sneezes, and the virus can live on a surface for up to 96 hours [13]. Additionally, the issue of asymptomatic transmission is argued by many parties because many people may present symptoms and many people may not after the infection. However, usually, healthcare professionals defined 14 days is the incubation period to understand if a person has been infected or not [24]. R_0 refers to the basic reproductive number to identify the average number of transmissions from an infected person [3]. There has been continuous argument regarding the exact number of this R_0 , and some say that R_0 can be unstable during an outbreak in a community [3]. Several studies found that health setting related transmission and infections amid healthcare providers gradually increased by the time [14,22].

Usual flu and COVID-19

It is hard to differentiate for many people between a common flue and COVID-19 infection due to the similarity of the symptoms. For example, Pyrexia is one type of cold known as a notable symptom in both flue and COVID-19 [7]. In general, flu is often caused by different strains of influence while COVID-19 follows a slower course of symptom presentation [12]. Additionally, having cough and feeling fatigued are two rare symptoms in the common cold; coryzal symptoms including nasal congestion is common in the usual cold but very uncommon in COVID-19 [12]. But, notably, both flu and COVID-19 causes damage to the respiratory system and in both diseases may differ from asymptomatic to acute pneumonia [12]. Both ailments can transmit by fomites, contact, droplets, thus respiratory etiquettes, as well as hand hygiene approaches, are the application for preventing infections [12].

Screening and diagnosis

Currently, there are a couple of potential screening instruments are globally used developed by WHO and the Center for Disease Control (CDC). In January, the CDC in

China informed the genetic sequence of the virus that helped other agencies worldwide to develop a diagnostic tool [12]. RT-PCR as a diagnosis tool is the common process of diagnosis these days, though many have argued that this tool is only 66-80 per cent effective. This indicates that 20-34 per cent of infected people can still be tested as negative [1]. Furthermore, it is stressed that a single negative test does not assure that a person is not infected, thus repeated tests are sometimes recommended [12].

Current pandemic

As of today (12 June 2020), the total number of infections reached to a little more 7.5 million globally with a death count of 423,844 and recovery rate of almost 4 million people [25]. The active number of infections is on the rise particularly in the South-Asian region whereas the upsurge in the European region has been curbing gradually. Additionally, New Zealand has become an ideal example to eradicate COVID-19 coming down to zero active cases [20]. Globally, more than 100 vaccine candidates are being tested and some of them are on trial to battle this pandemic [18]. The importance of such a global effort to discover a COVID-19 vaccine is ostensibly important right now.

Managing COVID-19

It is considered that there is hardly any proper medicine to manage this virus [19], and many suggest that symptomatic treatments are usually effective for this virus. Additionally, management of pneumonia is significantly essential amongst the absence of authenticated antiviral medicines. As asymptomatic management, paracetamol and choice of guaifenesin are commonly used to manage fever and cough [21]. Renal replacement therapy is sometimes used to manage septic shock and supplementary oxygen is administered for people who experience severe respiratory situation [21]. Patients who face bacterial infection during their infected period and empiric antimicrobial are provided to help them [12]. Moreover, the WHO recommends that the application of extracorporeal membrane oxygenation (ECMO) for supplemental oxygen source [1]. Social distancing is also found to be an effective mean to manage this pandemic globally. There are some common novel therapeutics are being used such as *Remdesivir*, *Lopinavir* and *Rtonavir*, *Umifenovir*, *Chloroquine*, *Antipyretics*, and *Systemic Corticosteroids* [12].

How can we prevent COVID-19?

Self-protection is considered the most effective way to prevent this virus. By maintaining hand hygiene and washing hands frequently is also effective for preventing COVID-19 infection [17]. It is also recommended that people should try and avoid touching their eyes, nose and face unnecessarily [17], which is arguably a difficult task to maintain. Maintain appropriate social distancing and wearing mask (N95 Masks) where necessary are found to be essential to prevent this infection. For healthcare professionals, the usage of personal protective

equipment (PPE) including double gloves, eye-shield, surgical masks, full-sleeved gowns are highly recommended [17]. Additionally, following self-isolation and quarantine procedures given are necessary for the prevention of this virus, which is commonly known as herd protection [red]. Furthermore, the consumption of vitamin-C and vitamin-D is strongly recommended to prevent and manage COVID-19 infection [12]. Trips and journeys including air travels should be operated as minimum as possible [blue]. Regarding the pandemic of COVID-19, the hospital-acquired infection has become a burning issue, especially for healthcare professionals as well as other patients. Restriction of public gatherings and ceasing community events are also found to effective in many countries to prevent the outbreak of this virus.

Concluding remarks

The management and prevention of COVID-19 have become a global phenomenon and almost every country is collaborating with international agencies to work interactively. The planning of the pandemic management and the development of COVID-19 vaccine has brought every nation together. This content has discussed significant literature to present what is COVID-19 and how it is originated. Additionally, there is also an explanation of how this virus is transmitted can help the audience to understand how to be cautious. The types of management and preventive measures are also thoroughly delineated in this piece of content. This article indicates that the world is still facing the most notorious pandemic of the present century, thus we as global citizens need to play our role to manage this pandemic altogether so that we can have a better world in the future. There has been enough argument regarding the timely disclosure of appropriate information of COVID-19. However, the nations need to think more sincerely so that they can work with integration to find a solution to eradicate this virus instead of criticizing each other. Perpetual research must be operated so that we can eventually trace down the origin of this virus in order to prevent any further outbreak in the future.

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