Management Strategies for COVID-19

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The emergence of a novel human coronavirus (SARS-CoV-2) causing severe contagious respiratory tract infections presents a serious threat to public health worldwide. Moreover, no specific antiviral agents are available against this disease known as COVID-19. Therefore, scientific, economic and social measurements are urgently needed for an effective pandemic containment. In the present work, we reviewed recent findings from literature about COVID-19 prophylaxis and management, which could provide a clear view and help readers to be aware of the current pandemic situation.

Keywords: COVID-19 ; Spread ; Prevention

1. Introduction

Belonging to coronaviridae family, coronaviruses (CoVs) are enveloped non-segmented positive-sense RNA viruses widespread in humans and animals [1]. CoVs were identified as causative agents of two previous epidemies, SARS (Severe Acute Respiratory Syndrome) and MERS (Middle-East Respiratory Syndrome) that both had previously negative economic and social impacts [2][3]. In December 2019, a new infectious respiratory disease caused by a novel CoV emerged in Wuhan, Hubei province, China [4]. High-throughput sequencing technology provided new insights into the identification of this virus [5][6] which was temporally named 2019-nCoV (2019 novel coronavirus) and closely related to SARS virus [7], then designated as SARS-CoV-2 [8]. The epidemic scale of SARS-CoV-2 infection has been continuously increasing around the world with more than 6,057,853 confirmed cases and 371,166 deaths [9]. Currently, there is no specific vaccine against SARS-CoV-2 infection which is critical. Therefore, scientific and social measurements are urgently needed for an effective pandemic containment. Several pharmacological and non-pharmacological approaches have been used worldwide with various clinical efficacy and outcomes.

2. Measures

Rigorous non-pharmaceutical measures should be implemented for an effective containment of COVID-19. Focusing on the pandemic dynamics and epidemiology is crucial and may provide helpful data. SARS-CoV-2 has been detected in a patient suffering from influenza-like illness in Wuhan suggesting an early community transmission in January and suggesting the urgent need for additional serological examination among populations to gain information about the history of the pandemic [10]. Serological assays play an important role in the detection of a convalescent case and transmission links. The generation of epidemiological data in more details and update is mandatory and could be helpful in pandemic outbreaks [11] and give an idea about geographical distribution and cases evolution. A mathematical modeling of geographical spread has been performed using a network-based approach to predict the COVID-19 risk at different geographical locations and future hotspots. The model has provided pertinent information on the spread based on the spatial distribution of existing cases, human mobility patterns, and administrative decisions which is an effective method for broader geographical countries [12].

Among other efficient strategies, social measures and safety practices could minimize the spread of this pandemic. Wearing face masks, it is considered as altruism and solidarity [13] especially with the revelation of asymptomatic transmission and stability of the virus in aerosols. A conceptual model has been developed using the suppression strategies based on social distancing and active protection and quarantining. This model concludes that lock-down is very effective for pandemic suppression [14]. The important role of safe behavior and interventions in the reduction of COVID-19 transmission has been confirmed [15]. Interestingly, the quantification of SARS-CoV-2 transmission may serve as an epidemic control, performing a contact-tracing App which builds a memory of proximity contacts and provide notifications about contacts of positive cases [16].

In another aspect of disease prevention, CQ and CQH have been recommended as prophylactic agents which is an important preventive initiative [17]. Providing this type of information could orient scientific committee and enhance the undertaken strategies to manage, control and limit at least the spread of COVID-19.

The COVID-19 pandemic caused by SARS-CoV-2 has affected communities around the world and caused devastating consequences. The scientific response to the COVID-19 outbreak is rapid, ranges from genomic investigations to drugs design and discovery. Based on data summarized in the present review, it is important to note that FDA approved drugs are most commonly tested since their efficacy and safety profile is known, which is helpful especially in pandemic situations. From results reported by different authors, we suggest some points that could be helpful in treatment option, such as the search for drugs from natural products known by their ability to inhibit the serine protease (TMPRSS2) priming and then S-protein binding, to induce neutralizing antibodies and/or to destroy the interaction between the receptor binding domain of SARS-CoV-2 and ACE2. Moreover, the use of drug combinations may serve as an approach for therapeutic interventions against the new emerging SARS-CoV-2. Interestingly, the consideration of hygiene conditions and contact isolation could play an important role in limiting the spread of COVID-19.

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