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Perspective

Trampled Drug Research for SARS-CoV-2 due to its Vaccines

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Abstract

The third human coronavirus severe acute respiratory distress syndrome coronavirus 2 (SARS-CoV-2) has been spawn a significant impact on the global human community. Although, vaccine discovery is a complex process, requiring much time and cost, however, at present, the world is more inclined to invent vaccines than the drug therapy. Healing drugs from natural sources or their derivatives were also effective in past epidemics. Even now many of them are working effectively. To date, only a few clinical trials are underway on the natural products. The non- and pre-clinical reports suggest that we have many natural compounds that act against human coronaviruses, including SARS-CoV-2. However, no clinical trial has been found on any isolated natural compounds. Citizens of many low- and middle-income countries (LMICs) around the world may be in dire need of a good cure as well as a vaccine. Unfortunately, it is true that citizens of many LMICs around the world will not have access to the novel corona vaccine for a significant period of time. Our goal now should be to eradicate this airborne virus successfully from all regions of the world in order to deal with it vigorously. For this, a good therapeutic compound might be an urgent issue because such drugs are relatively cheap and effective over the vaccines. Therefore, adequate pre-clinical and clinical trials must be needed on the already proven compounds having strong anti-SARS-CoV effects as it will help us to bring appropriate drug(s) besides its vaccine for this pandemic in time.

Keywords: *SARS-CoV-2; Covid-19; Natural Products; Drugs*

Introduction

Already the third coronavirus severe acute respiratory distress syndrome coronavirus 2 (SARS-CoV-2) has been spawn a significant impact on the global human community in terms of infection, pathogenesis, and mortality. It's a long way to stop the untimely in time. The world is now trying to make an impression of good times in its hand. A suitable vaccine or remedial medicine is our lifeblood now. Among the visible steps to bring a complete vaccine to market are various types of trials, registration, approval, thereby, mass production. In the current epidemic, it is imperative to ensure a successful and appropriate financial and research cooperation, adequate pre-primary, preliminary and final trial facilities, and overall approval and mass production facilities.

Vaccine discovery is a complex process, which requires a long time and cost. For this, much needed clinical trials have to be done in an ethical and systematic way. It is fortunate, that the development of vaccines for SARS-CoV-2 is much faster than the past epidemics over

time. Apart from financial stability and scientific viability, the terrible epidemic of the virus is more responsible for this. It is undeniable that in order to get a successful vaccine, we need to try from many angles, research and trial on many vaccines. However, the abundant consistency could have another impact on global financial losses and subsequent epidemic management. This is because the genome modification of SARS-CoV-2 is relatively low compared to the second coronavirus (SARS-CoV). So far, there have been several genomic and non-genomic mutations in the virus. Although we do not have a complete history of its pathogenesis, it has been seen that the viral infection and mortality rates are affecting people's age, disease, and even racial differences. It is irrelevant, but the novel coronavirus disease 2019 (Covid-19) has found to affect people's livelihoods, physical and mental, and even epidemic capitalism around the world. If the remedy is not found at the right time, the overall situation will get worse.

Outbreaks appear to be exacerbated during outbreaks of other viruses, such as Dengue, Zika, and Chikungunya. For example, the signs or symptoms of dengue patients in Bangladesh in 2018 are very different from those observed in 2019. Note that the mortality rate due to dengue virus infection increased to an undesirable amount within a year. Although not desirable, we are now unable to figure out how the next coronavirus could come about.

Past records show that the chemical drugs to each epidemic have to be thought of strongly; success also matched. At present, the world is more inclined to invent vaccines than the drugs. However, in addition to the vaccine, appropriate drug(s) is also essential. It's indisputable that the treatment option with chemical substances from diverse origin is an established and large platform in the modern era. Natural products and their derivatives have been playing pivotal roles from the ancient for the prevention and treatment of various diseases, including viral infections. For example, above 25% modern medicines are from plant derived [1]. Chloroquine extracted from the bark of the Cinchona tree (*Cinchona officinalis*), introduced in Europe in 1633 as an anti-malarial drug, is now widely used in malaria. On the other hand, the modified pyrazine analog favipiravir, discovered by Toyama Chemical Co., Ltd. in Japan, that has been still under considered as a tool against the pandemic Covid-19. To date, some clinical trials are underway on the natural products Açaí Berry (Phase 2), tannin specific natural extract, *Nigella sativa* (Phase 2), gum Arabic (Phase 2 and 3), natural honey (Phase 3) and honey and *Nigella sativa* (Phase 3). However, so far, except retinol palmatine, no clinical trial has been found on any isolated natural compounds that fight against SARS-CoV-2.

The vaccine development for SARS-CoV-2 infection is facing some crucial challenges, including the debate of protein targeting, undefined effects of this virus on the human lungs, novo developmental approach, undefined immunological pattern, simultaneous vast line up, high-mortality rate limiting adequate clinical trials with placebo treatments, inadequate funding and laboratory facilities, economic insecurity of by-products alongside the established vaccine, esteemed global allocation system, security of effectiveness over the viral mutation rates, and financial losses leading to complexity that may arise against future non-relevant pandemic preparedness are noticeable [2].

An ideal anti-SARS-CoV-2 drug should (i) restrict viral entrance, thereby inhibiting cellular attachment; (ii) inhibit viral replication in the host cells; (iii) exert cytotoxic effects on the existing viruses and (iv) provide protection to the normal host cells from the viral origin oxidative stress and inflammatory responses. A number of *in vitro*, *in silico* and *in vivo* reports have been demonstrated that natural compounds and their derivatives have anti-coronavirus effects, including SARS-CoV-2. Many of these compounds have been found to show multiple sword-like effects on the SARS-CoVs [3,4]. In general, natural products are compatible with the human body and we have ample scope for laboratory modifications of these substances, which could play a significant role in host protection and drug resistance along with the overcome of mutation-related complications of the virus. Moreover, by using such drugs as combined therapy, the cost and unbearable toxicity of the drug can be reduced along with increasing of therapeutic effectiveness.

To date, doctors age generously treating patients with some drugs, including chloroquine, hydroxychloroquine, chloroquine phosphate, azithromycin, lopinavir–ritonavir, interleukin-6 inhibitors, favipiravir and dexamethasone. Although these are not specific therapies for coronaviruses, including SARS-CoV-2 and there is no scientific evidence behind them that they can reduce mortality among Covid-19 patients. Many drugs, including chloroquine and its derivatives, antiviral drugs, and finally the favipiravir have been underwent several

clinical trials, although it is known that these are non-specific anti-SARS-CoV-2 drugs, many of which we do not know the toxicogenetical status. It would therefore be advisable to conduct adequate pre-clinical and clinical trials seriously of compounds that have been found to show strong anti-SARS-CoV effects. This will make it possible to bring the vaccine as well as the appropriate drug for this pandemic in time. Such research and trials can be shifted to low-income countries, especially those that do not have the facilities to produce vaccines and conduct clinical trials on them.

Conclusion

At present our chemical library is quite advanced which I think is capable to provide suitable chemical compounds for SARS-CoV-2. This will allow a considerable amount of time to be spent on drug discovery for SARS-CoV-2 as it will be able to find new products through cutting down the isolation time and cost. Therefore, this process is expected to go a long way beyond vaccine development. In addition, researchers will be encouraged to add new potential antiviral lead compounds for future pandemic outbreaks.

Conflict of Interest

None declared.

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