COVID-19: Investigational Drugs

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ABSTRACT

Coronavirus is a new virus responsible for an outbreak of severe respiratory illness among humans. This is a zoonotic pathogen which appeared first in Saudi Arabia and Jordan. According to WHO report, 858 deaths out of 27 countries were reported between April 2012 and December 2019. In the development of viral drugs, the best target is proteases having specificity and plays an important role in the processing of viral poly protein. If proper measures were not taken about 90% of world’s population get infected and 40.6 million would have been killed. So, this present review is focused on the investigation of drugs.

Key words: Covid–Anti viral–SARS

1 INTRODUCTION

Till date COVID-19 has no drugs either for the prevention or treatment. Discovering new drugs or therapeutic switching of an existing drug is a complicated and time-consuming process. Certain drug categories have been proposed for the effective treatment of COVID-19 includes antiviral agents, immunotherapies, and vaccines. 332 high-confidence SARS-CoV-2 human protein-protein interactions are identified by Gordon et al. Out of these high number of proteins, only 66 human proteins are targeted by 69 existing FDA-approved drugs, drugs in clinical trials, and/or preclinical compounds. Up to date research is going on in order to find out the efficacy of the drugs in SARS-CoV-2 infection. [1]

1.1 Antiviral Agents

A nucleotide analog namely remdesivir in Figure 1 (GS-5734; Gilead Sciences, Inc) which is a prodrug and have been categorised as a broad spectrum anti-viral agent. This drug was developed for the treatment of Ebola virus and Marburg virus. Anti-viral activity of this drug can also used against corona though not proved as it requires more clinical data. [2]

Remdesivir is not only used to inhibit the replication of severe acute respiratory syndrome coronavirus (SARS-CoV) in 2003 and Middle East respiratory syndrome coronavirus (MERS-CoV) in 2012 but also its inhibition capacity has gained access to treat corona. [3]

Lopinavir/ritonavir

Marmosets and mice infected with MERS-CoV showed an improvement in clinical parameters by using a regimen of lopinavir/ritonavir Figure 2 with IFNb

Figure 1. Structure of Remdesivir
Adult patients (n=199) with positive SARS-CoV-2 infection are subjected to randomized, controlled clinical trials whose oxygen saturation should be of 94% or less/ PaO$_2$ of less than 300 mm Hg and were receiving a range of ventilatory support modes (eg, no support, mechanical ventilation, extracorporeal membrane oxygenation [ECMO]). Patients added to Standard care(n=99) or standard care alone (n=100) received. These patients received lopinavir/ritonavir 400 mg/100 mg PO BID for 14 days in a randomised fashion. The received groups did not differ in their clinical outcome and shows lesser mortality rate i.e) 28 days when compared to standard care. [4]

Hydroxychloroquine and chloroquine
Apart from its anti-malarial activity, these are used to treat auto immune disorders like SLE, Rheumatoid arthritis by showing its immune modulatory effects. Interestingly, due to the inhibition of heme polymerase, they found a place in antiviral infection treatment. These also inhibits the pH-dependent steps of viral replication due to the alkalisation of the phagolysosome. Wang et al reported that chloroquine effectively inhibits SARS-CoV-2 in vitro. [5]Hydroxychloroquine depicted inFigure 3

Azithromycin

A study in France revealed that patients positive to SARS-CoV-2 are concomitantly suffering from bacterial superinfection were exposed to treatment including azithromycinFigure 4 in 6 patients. Patients who have undergone this treatment had a complete clearance of SARS-CoV-2. These results must undergo further analysis. Patients taking combination therapy had lower viral load as compared to patients taking hydroxychloroquine alone. [6].

2 CONCLUSION
Covid-19 is widely distributed in the areas of middle east countries causing sporadic human disease and reminded in WHO Blueprint 2020 list of priority. To avoid the further spread and to reduce the deaths all countries should invest on research activities and vaccine invention.

REFERENCES

