



STUDY OF SOME ANTIVIRAL DRUGS FOR COVID-19

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Abstract: In the recent days COVID-19 an epidemiological disease is acting as a pandemic for the world. Chloroquine, Hydroxychloroquine, Azithromycin and Remdesivir drugs are used to treat the patients of COVID-19. The effect of combination of hydroxychloroquine and Azithromycin results in a drug for the treatment of COVID-19.

Key Words: COVID-19, SARS-CoV-2, chloroquine, hydroxychloroquine, azithromycin, Remdesivir

INTRODUCTION

In the recent days COVID-19 an epidemiological disease is acting as a pandemic for the world. It was first originated in Wuhan of China during December 2019. On March 12th 2020 the WHO declared COVID-19 as a pandemic disease. A response has come from China to the respiratory disease caused by the new coronavirus (SARS-CoV-2) that emerged in December 2019 in this country (Colson et al., 2020). The recent publication of results showing the in vitro activity of Chloroquine, Hydroxychloroquine and Azithromycin against COVID-19.

According to recent study of Chinese, 80% of patients present with mild disease and the overall case-fatality rate is about 2.3% but reaches 8.0% in patients aged 70 to 79 years and 14.8% in those aged >80 years (Wu Z, McGoogan JM., 2019). Thus, there is an urge to reduce spread of disease to community. Chloroquine, Hydroxychloroquine and Azithromycin drugs are used to treat the corona effectives.

STUDY OF DRUGS

The chloroquine is used to treat for the malaria which belongs to the class of drugs named as antimalarials. This is used as a medicine for more than 70 years worldwide for the treatment since it's a cheap and established clinically safe. So, chloroquine is used for the treatment of SARS-Cov-2 (the new virus causing COVID-19). Another drug used for treating COVID-19 is Hydroxychloroquine. It is also used as antimalarial, but now broadly used in autoimmune diseases such as lupus and rheumatoid arthritis (F. Touret and X. de Lamballerie, 2020). It belongs to a class of medications named Disease Modifying Antirheumatic Drugs (DMARDs). It reduces swelling/pain in arthritis and skin problems in lupus. One more most important drug used is Azithromycin, used to treat variety of bacterial infections. It is macrolide-type antibiotic. It stops the growth of bacteria in an infected person.

In recent study of wang and others (wang et al., 2020) evaluated five FDA-approved in vitro drugs and two broad spectrum antivirals against clinical isolate for COVID-19 (F. Touret and X. de Lamballerie, 2020). The Indian Council of Medical Research, recommended hydroxychloroquine for the patients of COVID-19. In India the effect of corona spreading among the communities is bit slow because of lockdown in the country from March 21st 2020. Even though some are affected and are under the treatment. The Chloroquine, Hydroxychloroquine and Azithromycin drugs used for the treatment. Lopinavir/Ritonavir is mainly used for the treatment

of HIV(Human Immunodeficiency syndrome) infected, it blocks the viral entry into cellular and it is effective against SARS-CoV-1 both in vitro and human studies. It is suggested once a day for adults and twice a day for aged.

Remdesivir is effective against SARS(severe acute respiratory syndrome) and MERS(Middle-East respiratory syndrome) and it retards viral application. It (also GS-5734) is a monophosphoramidate prodrug of an adenosine analogue that has a broad antiviral spectrum including filoviruses, paramyxoviruses, Pneumoviruses, and coronaviruses. In vitro, remdesivir inhibits all human and animal coronaviruses tested to date, including SARS-CoV-2, and has shown antiviral and clinical effects in animal models SARS-CoV-1 and middle East respiratory syndrome (MERS)-Cov infections. Patients received either intravenous remdesivir (200mg on day 1 followed by 100mg on days 2-10 in single daily infusions). Remdesivir cut the duration of symptoms from 15 days down to 11 in clinical trial at hospitals around the world.

Table : Drugs used to prevent COVID-19(Awadhesh Kumar Singh et al.,2020)

Drug	Dosage
Chloroquine and Hydroxychloroquine	Chloroquine phosphate 500 mg BID for 10 days
	<u>COVID-19 Pneumonia</u> : Chloroquine phosphate 500 mg BID for 5 days plus Darunavir 800 mg/ Cobicistat 150 mg OD for 2 weeks.
	<u>Mild to moderate COVID-19</u> : Lopinavir/ritonavir plus Chloroquine 500 mg
	2/day or Hydroxychloroquine 200 mg per day for 10 days.
	<u>Moderate to severe COVID-19</u> : Lopinavir 400mg/Ritonavir 100 mg BID or Chloroquine 500 mg orally per day or Hydroxychloroquine 400 mg orally per day for 7-10 days or Hydroxychloroquine 400 mg BID x 2 doses then 12 h later start 400 mg OD for 5e10 days.
	<u>Severe or critical COVID-19</u> : Remdesivir plus Chloroquine 500 mg
	2/day or Hydroxychloroquine 200 mg per day for 10e20 days.
	Critical COVID-19: Remdesivir for 10 days plus chloroquine for 5 day. Hydroxychloroquine 200 mg TID for 10 days.

OD-once daily, BID-twice daily, TID-thrice daily, URTI- upper respiratory tract infection, PCR-polymerase chain reaction, i.v – intravenous

Figure 1: Percentage of patients with PCR-positive samples from inclusion to day6 in COVID-19 patients treated with hydroxychloroquine and in COVID-19 control patients.

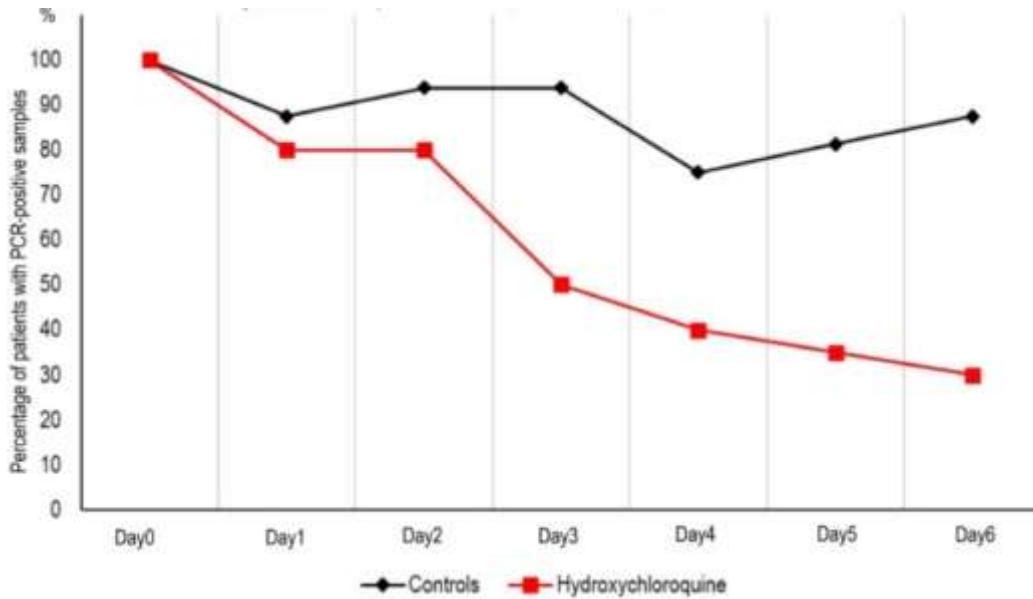
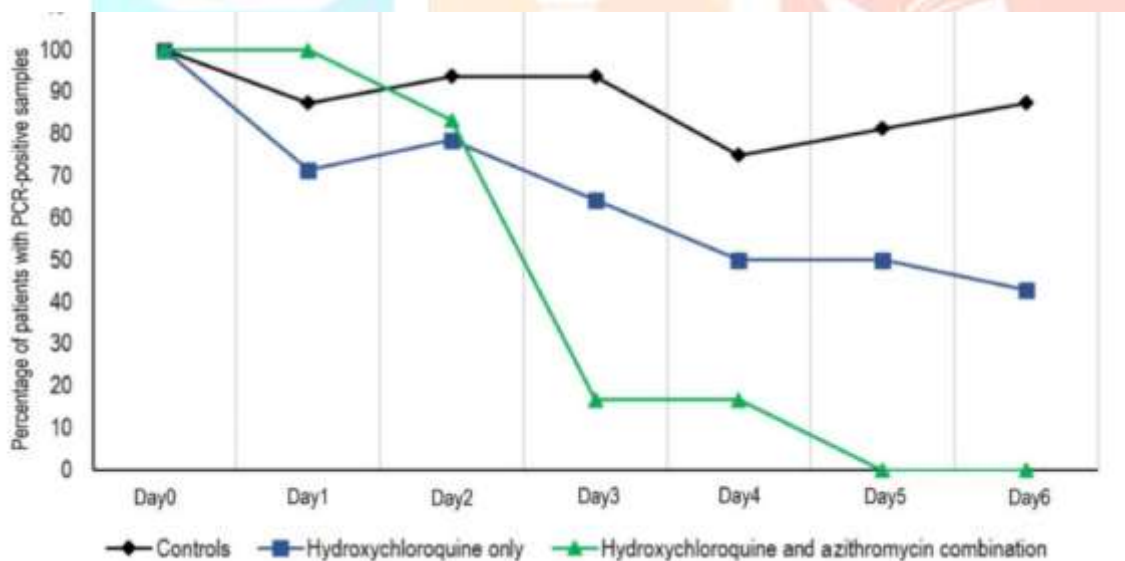


Figure 2: Percentage of patients with PCR-positive samples from inclusion to day6 in COVID-19 patients treated with hydroxychloroquine only, in COVID-19 patients treated with combination of hydroxychloroquine and azithromycin, and in COVID-19 control patients.



The effect of combination of hydroxychloroquine and Azithromycin results in a drug for the treatment of COVID-19. Azithromycin helps to fight against zika and ebola virus and prevents severe respiratory tract infections when patients suffering viral infection(Bacharier LB,2015).

CONCLUSION

By our study it can be concluded that chloroquine, hydroxychloroquine and azithromycin drugs helps to cure the viral infections caused by COVID-19. From plots it shows that the combination of Hydroxychloroquine and Azithromycin results better than Hydroxychloroquine only, for the treatment of COVID-19. Recently Remdesivir is also helpful in curing the viral fever.

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