

Triple Drug Combination Hydroxychloroquine, Azithromycin, & Zinc to Win Battle against COVID-19

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Abstract:- Coronavirus is an infectious disease which is rapidly spreading as a pandemic and causes significant deaths. COVID-19 was first found on 19th Dec 2019 in Wuhan city of china and now it's spreading globally resulting in pandemic. Corona virus is newly found disease due to which there hasn't proper defined treatment found out. This corona virus now reached almost all the parts of the World affecting more than 187 Countries around the globe. Now the overall cases are increasing rapidly day by day. We made hypothesis on the basis of outgoing research all around the world newly found corona virus which may be helpful in prevention and treatment of novel corona virus.

Keywords:- COVID-19, Treatment, SARS-COV2, Hydroxychloroquine, Azithromycin, Zinc Sulphate.

I. INTRODUCTION

Corona virus pandemic is being caused due to severe acute respiratory syndrome(SARS COV-2). Now corona virus patients are also found all over India. First case was found in Kerla, India. Specifically it is an infectious type of disease. It causes pneumonia, cytokine release type syndrome, kidney failure and incubation period of this disease is usually 2 to 14 days from the day of entering the virus into the body. We can diagnose the corona virus by rRT-PCR CT-Scan. We can take preventive measures by washing hands frequently, using masks, self-quarantining and social distancing.

There are mild to serious symptoms found in this disease like fever, fatigue, cough, cold, shortness of breath, loss of smell and taste. In some patients we can see ache and pain, sore throat, headache, conjunctivitis and discoloration of fingers and toes, diarrhea. It may serious types of syndromes like chest pain or pressure and loss of speech or movement. Despite limited and conflicting data FDA authorized and gave the permission to use HCQ and CQ to treat corona. HCQ is being sold by using brand name Plaquenil. This HCQ was being used for a long time for curing the diseases like Malaria, Rheumatoid arthritis and

Lupus. It is commonly administrated via swallowing. Bio-availability of this drug is varied from an average 74% in maximum time 2-4.5 hour. We can take this HCQ with or without Azithromycin to treat COVID-19.

Symptoms of COVID-19

(coronavirus disease 2019)

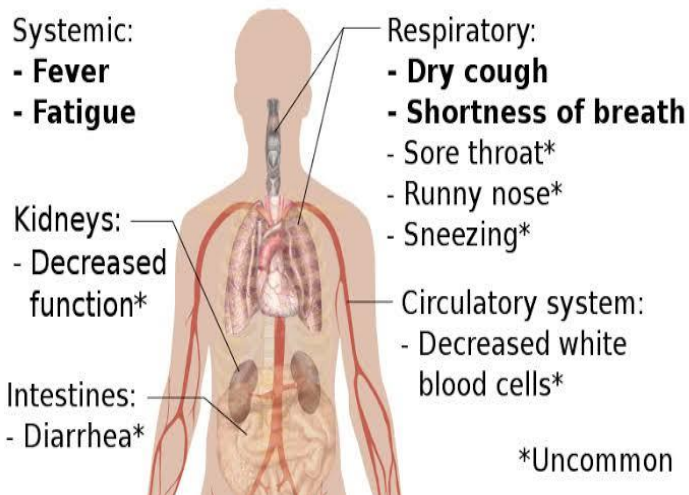


Fig 1:- Symptoms of Corona virus

HCQ was efficient partly based on in vitro activity against SARS-COV2. From the recent studies which are conducted in china shows that CQ has beneficial in treatment of corona.

CQ and HCQ metabolites drug are acting as weak bases and these drugs assemble inside the Endosomes, Golgi vesicles and Lysosomes within cell which leads to rise in PH within compartment. These rise in PH impede replication and un-coating specially Lysosomes. To stop this corona virus Endosomes acidification is required for actual functioning for inhibition of CQ and HCQ there needs to rise in PH of intracellular compartment, so clinical data in human yielded mixed disappointing result.

II. HYDROXYCHLOROQUINE

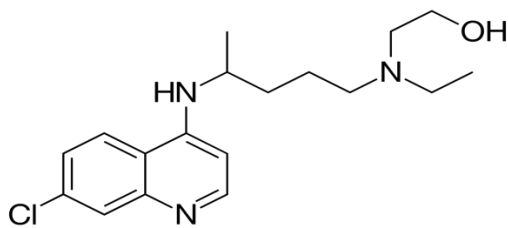


Fig 2

HCQ shows antiviral properties. Mechanism of HCQ includes involvements with glycosylation of an angiotensin converting enzyme (ACE) -2. HCQ also shows immuno modulatory properties which increases synergistic effect on antiviral property. In spite of these may still have role to play when combined with zinc sulphate.

Zinc also comes in category of essential trace element with comes in elemental category as post transition metal alternatively considered a transition metal. Zinc is required as adaptive and innate immune response. The Zinc benefits have been previously been recognized for its therapeutic use against other respiratory virus including those that causes common cold and pneumonia .Now we get to know that CQ has properties of zinc ionophore and it targets extra cellular stress element Zinc to intracellular concentration and physiologically it shows antiviral effect. Some clinical trials shows that Zinc create activities against several viruses. Zinc prevents the activity of RNA dependent and RNA polymerase (RdRp) of Hepatitis E virus also Zinc inhibits corona virus RdRp activity and zinc ionophore block corona virus replications. So Zinc in combination with HCQ shows synergistic and additive effect on patients. This combination is already being tested as a prophylactic regimen.

III. MECHANISM

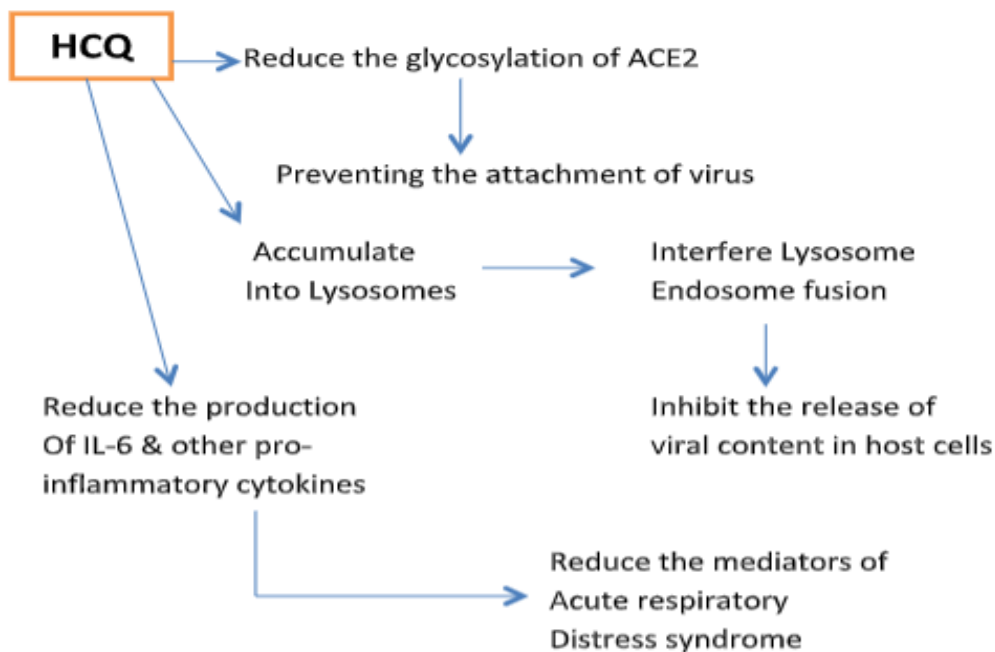


Fig 3:- Mechanism of Hydroxychloroquine in COVID-19

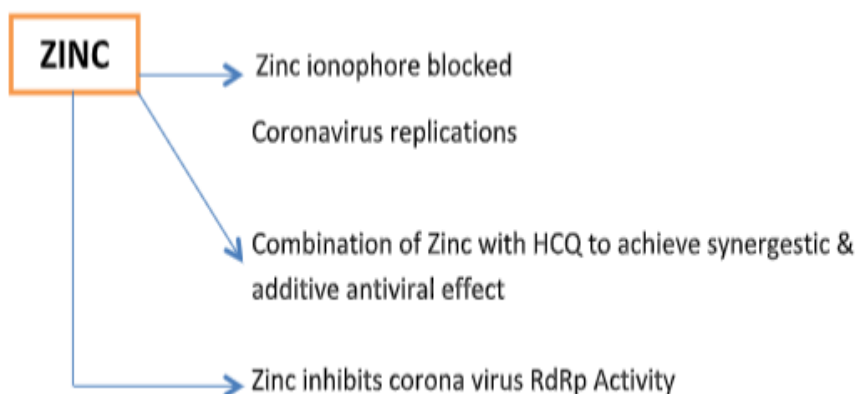


Fig 4:- Mechanism of combination of Zinc with HCQ in COVID-19

IV. STATISTICS

Patients were categorized on based on their exposure to HCQ(400mg BD for 5 days) and Azithromycin (500 mg once daily) alone or with Zinc sulphate (220 mg) capsule (50 mg elemental zinc BD for 5 days) for the treatment in addition to standard care.

Triple combination of HCQ with oral Zinc and antibiotic Azithromycin is being used by some medical practitioners.

V. CONCLUSION

The combination of HCQ with Zinc sulphate has no effect on duration of hospitalization, time of ventilation or ICU duration. Study shows that Zinc sulphate rises the frequency of corona patient were discharging home safely and no need for ventilation. There is reduction in death rate. The main finding of this study is that after adjusting for the timing of Zinc therapy, we get to know that combination of Zinc sulphate to HCQ and azithromycin was seem to associate with a lower in death rate or transition to hospice in patients who does not need ICU level of care . Basically Zinc showing role in preventing the virus progress.

If we are giving effective COVID-19 treatment to reduce hospital stay duration also less need for prolonged mechanical ventilation and but lowing death rate is still to be achieved. We hypothesize that the triple combination of CQ/HCQ with azithromycin and Zinc in treatment of corona virus patients, in an OPD and IPD setting, may help to increase clinical outcomes and to lower the COVID-19 fatality rate.

Triple combination of CQ/HCQ with antibiotic azithromycin and Zinc shows safety, efficacy, tolerability. This hypothesis can be rapidly evaluated by amendment of suitable WHO-supported solidary trials or other studies.

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