Role of Drugs in COVID 19 Patient: A Review

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Author’s contribution

The sole author designed, analyzed, interpreted and prepared the manuscript.

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ABSTRACT

Background: No specific drug treatment is available for the COVID-19. Various drugs are being used and repurposed as COVID-19 treatment.

Summary: COVID-19 has no defined treatment course because it has no precedent. Various drugs are tried and tested to be used upon patients to treat particular symptom. Hydroxychloroquine, lopinavir, ritonavir and so on are the famous drugs being repurposed as COVID-19 treatment drugs. Prophylactics are not widely listed but supplements and drugs which contain anti-inflammatory properties and anti-oxidants should be inculcated in the diet so that innate immune response can fight off the external pathogenic invasion all by itself.

Conclusion: Drugs listed for repurposing method must be tried and tested before administrated it to a severely ill patients or to a large chunk of population. Proper study needs to be done before administered and starting full-fledged usage of any existing drug not meant for the treatment of COVID-19.

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1. INTRODUCTION

COVID-19 or coronavirus disease 2019 is the unprecedented disease pandemic which has grappled the entire world and spreads through every nook and corner. Almost all aspect of human life has been affected by the COVID-19. Members of Homo sapiens or wise men species are struggling in containing the spread of the novel coronavirus or SARS-COV-2, a successor of previous disease causing virus SARS-COV. As of February 9, 2021, 108,884,498 COVID-19 infection cases has been registered across 220 regions and geographical areas while 2,340,087 case fatalities have been reported due to COVID-19 related complications [2]. No disease outbreak has crossed the landmark of Hundred million cases in almost one year and two million deaths in such a short span of time in almost past hundred years of human civilization. World Health Organization (WHO) has declared the disease outbreak as pandemic in the month of March 2020, which was never happened since the inception of WHO [3]. United States of America, India, Brazil, Russian Federation, United Kingdom and France are the top countries having more than half of case load infections and mortalities due to COVID-19 [4]. New mutated strain from Brazil, United Kingdom and South Africa is raising serious cause of concern as it is supposedly seventy percent more virulent that the present strain [5]. As the COVID-19 pandemic has no precedent or history, no particular or specific treatment methodology is available to contain the disease spread. Various methods are tried and tested according to the condition of the patient. Asymptomatic patients are advised to stay at home and seek medical attention when symptom deteriorate. Otherwise a medical supervisor can be constantly monitor a home isolated patients and it can have many benefits. Medication are being administered according to the clinical symptoms shown. Some drugs which are already being indicated for other medicinal usage can be effectively used in containing particular symptoms of COVID-19. The reposition or repurposing of the drugs is the cost effective as well time saving method to deal with such contagious disease outbreak. Drugs such as Hydroxychloroquine, Lopinavir-Ritonavir, are already widely used for the respective treatment but it can be repurposed to check its efficacy in COVID-19. Prophylactics are not widely listed but supplements and drugs which contain anti-inflammatory properties and anti-oxidants should be inculcated in the diet so that innate immune response can fight off the external pathogenic invasion all by itself.

2. TREATMENT OF ASYMPTOMATIC COVID-19 PATIENTS

There are two types of COVID-19 patients which are identified as symptomatic and asymptomatic patients. Symptomatic patients show symptoms ranging from milder to severe category. But in case of asymptomatic patients, the symptoms are not shown by person affected by the infection. There is a large prevalence of asymptomatic COVID-19 patients all over the world. These persons are carrier of the disease and are possible transmitter of the disease therefore it is necessary not to ignore these persons and treat them with utmost priority. Asymptomatic patients accounts for major chunk of the cases. As the high spreading capabilities of the virus, the hospitals and point of care facilities are over whelmed with the infection cases. Therefore asymptomatic patients are advised to stay at home under medical supervision. They need not come to hospital and seek sophisticated medical care as they can be treated at home itself. This will lessen the burden on the hospitals and health care facilities and infected persons can be at home comfort. Asymptomatic patients are identified after their close acquaintance tested positive for COVID-19. The incubation period varies from 2 to 14 days and averages between 5 to 6 days. Asymptomatic patients are advised to be at home and take rest. Isolation of the patient is must and maintaining safe and minimum distance from the infected person must be followed strictly. Although there is no fix medical treatment course, the efforts are made to contain and reduce the symptoms of the COVID-19 with various drugs available in the drug store markets. Asymptomatic patients after one or two weeks of self-isolation and with no symptoms can be called as cured [6].

3. TREATMENT OF MILD TO MODERATE COVID-19 SYMPTOMS

As the asymptomatic COVID-19 patients can be progressed in to developing some symptoms. So far, mild to moderate symptoms cases also contribute major portion of cases. Milder symptoms includes cough, cold and fever along
4. Repurposing the Available Drugs

COVID-19 is the unprecedented pandemic that is affecting billions of life adversely. As the disease outbreak turned pandemic has no medical history, there is no established treatment course available for the containment of COVID-19. Scientific and medical fraternity is trying hard to develop cure for the pandemic, till makeshift treatment are being administered to contain the symptoms. Repurposing the available drugs can be a beneficial approach in treating the COVID-19 treatment. Many drugs contains varied contents that are effective on wide range of symptoms. It is considered as one of the cost effective and efficient approach till the full proof medicinal treatment course which is specific for the disease is available. Repurposing or repositioning of the drugs can be done with 3 out of 4 drugs which are available in the market that is 75 percent available drugs can be used for other purpose that initially were not intended to do so. So far the vaccine was far away from roll out and is effectivity study has not been done. Further it will take a whole lot of resources to develop a specific and targeted drug for the treatment of new disease. The demand supply rule is already broken as more patients are being repotted on daily basis than those which are cured. Therefore repurposing or repositioning of can be extremely beneficial in fight against COVID-19. Basically the drugs which are being repositioned falls into two groups. One which prohibits the viral replication cycle and second which aims to arrest the symptoms.

5. Hydroxychloroquine and Chloroquine

This drugs was the buzz word in the initial period of the pandemic of COVID-19 and demand of this drug sky rocketed. Hydroxychloroquine (HCQ) and chloroquine (CQ) are currently being used for anti-malarial purpose all over the world. In COVID-19 the HCQ and CQ are used to block the entry of the novel coronavirus or SARS-COV-2 in to the host cell by breaking down the production protein which is viral by constraining endosomal acidification. Many number of trials are being done. It is used as prophylactics in many countries and are given to health care professionals and workers. The home isolation cases are also advised to take HCQ and CQ along with family members and friends in order to protect themselves from the infection. The administration of HCQ and CQ was mainly done to reduce the mortality rate. But no concrete evidence was found in cohort study from either health care professionals or normal person’s data. No considerable benefit was found to be happening while administering the HCQ and CQ dosage under supervision. Tablets are available of these drugs and can orally administered. There are contraindications which must be followed in order to safeguard the patient. Patients with hepatic and renal dysfunction must be caution while taking the dosage as this may interfere with previous medications. Hepatic failure has also been seen in several patients after the administration of the said drugs. Although the long term impacts of the HCQ and CQ are not yet revealed but a cautious approach
and constant monitoring is the key to effectively utilize the anti-malarial such as HCQ and CQ which are particularly helpful in severely ill patients [7].

6. REMDESIVIR

Remdesivir is also a potential drug which can be used in the treatment of COVID-19 pandemic. Remdesivir is the popular drugs used for its anti-viral properties. Now in the scenario of COVID-19 pandemic, its usage has been retained and repositioning if the drug has already been started to treat the patient. A study conducted on the efficacy of Remdesivir as a potential drug for the treatment of COVID-19 has been done. Randomized control trials with two dosage that is one Remdesivir and second placebo was administered. 1062 patients were studied among which 541 were administered Remdesivir and 521 was assigned to placebo. Remdesivir has shown less time for recovery than placebo which shows the success of the therapy. Remdesivir receiving patients mean recovery period was 10 days while in case of placebo it was 15 days. Administration of Remdesivir inhibits the worsening of symptoms such as progressing in to severe acute respiratory syndrome. Overall the severe clinical outcome proportion was lower among Remdesivir administered group than otherwise. Usage of Remdesivir as a treatment drug may not only lowers the case load but also lowers the burden on sophisticated medical equipment’s which are already scarce. Although the long term impacts of the Remdesivir are not yet revealed but a cautious approach and constant monitoring is the key to effectively utilize the Remdesivir which are particularly helpful in extremely severe patients [8].

7. LOPINAVIR AND RITONAVIR

Combination drug of lopinavir and ritonavir are antiretroviral medications used in the treatment and prevention of human immunodeficiency virus causing acquired immunodeficiency syndrome (HIV AIDS). Interestingly, it was observed that countries with higher HIV AIDS patients were not comparably high in COVID-19 case infections as well as mortality rates. This was then tried to see through the prism of drugs called lopinavir and ritonavir. The widely used drug are now being considered as repositioned drug for the treatment of COVID-19. HIV Protease inhibitor Lopinavir when combined with ritonavir increases half-life of plasma. Pre-clinical and already available studies also have some indications regarding the usage of lopinavir and ritonavir in anti-viral environment. A large cohort study conducted on 11847 patients have some valuable insights on whether the aforementioned drugs are useful in treatment of the COVID-19 or not. Among which 7825 patients were randomly assigned lopinavir and ritonavir combination on the basis of randomized controlled trials. Among which 1616 patients were administered the lopinavir-ritonavir combination, 3424 were allocated the regular health care, and rest were administered other recovery therapies. No significant difference was found in mortality rate after the administration of lopinavir and ritonavir during the study period. Although the long term impacts of the Lopinavir and Ritonavir are not yet revealed but a cautious approach and constant monitoring is the key to effectively utilize the HIV AIDS drugs such as Lopinavir and Ritonavir which are particularly helpful in terminally ill patients [9].

8. CORTICOSTEROIDS

Corticosteroids such as dexamethasone are being administered in COVID-19 condition. Corticosteroids are said to be beneficial in critical symptoms like acute respiratory distress syndrome and hypoxia which requires ventilation and oxygen support system. COVID-19 is notorious for inducing inflammation internally and can be harmful. Lung injury and multi organ failure can be resulted if not treated in time. The anti-inflammatory properties of corticosteroids can be beneficial in reducing internal inflammation and may benefit in countering the harmful impacts of COVID-19. Although the long term impacts of the corticosteroids are not yet revealed but a cautious approach and constant monitoring is the key to effectively utilize the corticosteroids such as dexamethasone which are particularly helpful in severely ill patients [10].

9. TOCILIZUMAB

Tocilizumab is the drugs which is generally prescribed for the patients of rheumatoid arthritis or any other arthritis. Tocilizumab inhibits the interleukin 6 or IL 6 mediated signaling by blocking the binding site receptors. The anti-inflammatory properties of the drug and other associated therapeutic impact can be useful in treatment of the COVID-19. This along with dexamethasone, a corticosteroid were supposedly helped in containing the mortality rate among severely ill COVID-19 patients. A study conducted about the efficacy of the drug
was done among 243 patients out of which 141 male and 102 female candidates was the gender division. The median time of removing oxygen or discontinuing due to lack of necessity in Tocilizumab administered patients was 4.9 days whereas it was 5 days among placebo administered patients. Tocilizumab administered group were having marginally improved rate of recovery than the placebo group which cannot be counted as great advantage of administering a particular drug. Tocilizumab has its own benefits but totally relying on it is not the solution. Contemporary solution according to ground situation can be the best way out for containing the pandemic. Although the long term impacts of the Tocilizumab are not yet revealed but a cautious approach and constant monitoring is the key to effectively utilize the rheumatoid medications such as Tocilizumab which are particularly helpful in critically ill patients [11].

Other Drugs which are in news and are being repositioned as repurposed drug for COVID-19 treatment for treating severely ill patients are Nafamostat, Camostat which is drugs usually prescribed for pancreatitis in Japan but is known repurposed for COVID-19 treatment. Promising results intrigued the researchers to conduct trials of next phases. Famotidine, which is an over the counter heart burn medicine, was found to be suppressing the intubation in some patients in China. Still trials are underway and more results are awaited before using it as a treatment course. Umifenovir and Nitazoxanide are under scanner for their anti-viral and anti-infective properties which is of immense use in COVID-19 condition.

10. PROPHYLACTICS FOR COVID-19

Considering the novelty of the COVID-19 pandemic, there is no precedent available of the disease and therefore there is no sure shot treatment methodologies for the disease control. Also the high virulent nature of the virus and capacity if producing fatal clinical outcomes makes the disease even worse. Therefore it is important to protect and prevent oneself from the disease to avoid such consequences. Long term persistence of the symptoms post recovery is becoming a serious cause of concern which also give impetus to the demand of usage of various preventive measures and prophylactics available. Vaccine is in initial stage of distribution and it will take time to quantify the study about the effects on various parameter and the logistics and delivering the vaccine is a major issue which indicates towards considerable amount of time before it is given to all [12]. World Health Organization (WHO) and various other governmental agencies have designed certain preventive measures and listed some prophylactics which can be inculcated in daily routine to ward of the novel coronavirus infection. Along with inculcation of social vaccine which is wearing masks, maintain physical distancing, avoiding going out if not necessary, sanitizing hands on regular intervals, other prophylactics such as changes in diet which are beneficial in enhancing the immunity is also useful in warding off infections. COVID-19 attacks on weak immunity humans which are the soft target for novel coronavirus to spread. Therefore by strengthening the innate immune response by various methods, one can definitely ward off such viruses with proper precautions. HCQ was widely circulated as prophylactic drug but did not show any impressive results post intake. Anti-inflammatory, anti-oxidants medicines or tablets such supplements of Vitamin C, Vitamin D, probiotic can be advised to take as a prophylactics in order to ward off the disease but strictly under medical supervision. Balance diet and adequate exercise is also able to act as potential prophylactics in if followed properly [13-22].

11. CONCLUSION

COVID-19 must be controlled at any cost because a multi scale ruckus has already been created by it and no further loss of any kind can be expected from it. Home isolation can be best way to reduce the burden in the health care infrastructure. But patients under home isolation must be provided with adequate medical attention so that their queries and symptoms are heard. Technology can be used to stay in touch with the asymptomatic patients. Drugs listed for repurposing method must be tries and tested before administering it to a severely ill patients or to a large chunk of population. If adverse impacts are more than the benefits then the drugs must be discontinues. Over the counter usage of any of these drugs must be completely prohibited so that any medical complications may not arise. Prophylactics can be used to serve as shield to protect oneself from the virus infection.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.
COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCE

1. Dushyant Bawiskar, Pratik Phansopkar, Ayurva Vlas Gotmale. COVID-19 Facets: Pandemics, Curse and Humanity. ijrps. 2020;11(SPL1):385–90.
2. COVID-19 Map [Internet]. Johns Hopkins Coronavirus Resource Center. [cited 2021 Feb 10]. Available: https://coronavirus.jhu.edu/map.html
3. WHO Director-General’s opening remarks at the media briefing on COVID-19 - 11 March 2020.pdf
4. WHO Coronavirus Disease (COVID-19) Dashboard [Internet]. [cited 2021 Feb 10]. Available: https://covid19.who.int
5. Wise J. Covid-19: New coronavirus variant is identified in UK. BMJ [Internet]. 2020 Dec 16 [cited 2020 Dec 23];371:m4857. Available: https://www.bmj.com/content/371/bmj.m4857
6. Treatment of Coronavirus Disease 2019 (COVID-19): Investigational Drugs and Other Therapies: Introduction, Antiviral Agents, Immunomodulators and Other Investigational Therapies; 2021 [cited 2021 Feb 2]; Available: https://emedicine.medscape.com/article/2500116-overview
7. Shaffer L. 15 drugs being tested to treat COVID-19 and how they would work. Nature Medicine [Internet]. 2020 May 15 [cited 2021 Feb 7]; Available: https://www.nature.com/articles/d41591-020-00019-9
8. Beigel JH, Tomashek KM, Dodd LE, Mehta AK, Zingman BS, Kalil AC, et al. Remdesivir for the Treatment of Covid-19 — Final Report. New England Journal of Medicine [Internet]. 2020 Nov 5 [cited 2021 Feb 9];383(19):1813–26. Available: https://doi.org/10.1056/NEJMoa2007764
9. Owa AB, Owa OT. Lopinavir/ritonavir use in Covid-19 infection: is it completely non-beneficial? Journal of Microbiology, Immunology and Infection [Internet]. 2020; 53(5):674–5. [cited 2021 Feb 9] Available: https://www.sciencedirect.com/science/article/pii/S1684118220301286
10. Mishra GP, Mulani J. Corticosteroids for COVID-19: the search for an optimum duration of therapy. The Lancet Respiratory Medicine [Internet]. 2021 Jan 1 [cited 2021 Feb 9];9(1):e8. Available: https://www.thelancet.com/journals/laneur/article/PIIS2213-2600(20)30530-0/abstract
11. Stone JH, Frigault MJ, Serling-Boyd NJ, Fernandes AD, Harvey L, Foulkes AS, et al. Efficacy of Tocilizumab in Patients Hospitalized with Covid-19. N Engl J Med. 2020;12.
12. Smit M, Marinosci A, Agoritsas T, Ford N, Calmy A. Prophylaxis for COVID-19: a systematic review. Clinical Microbiology and Infection [Internet]. 2021. [cited 2021 Feb 9]; Available: https://www.sciencedirect.com/science/article/pii/S1198743X21000409
13. Women TPJJ 2020By ATATALP, Trust C and Dental Sciences. Investigational treatments for COVID-19 [Internet]. Pharmaceutical Journal. [cited 2021 Feb 7]. Available: https://www.pharmaceutical-journal.com/research/review-article/investigational-treatments-for-covid-19/20208051.article
14. Khubchandani, Sheetal Rameshlal, and Trupti Madhav Dahane. “Emerging Therapeutic Options for COVID-19.” Journal of Evolution of Medical and Dental Sciences-Jemds. 2020;9(41):3082–85. https://doi.org/10.14260/jemds/2020/677.
15. Kute, Vivek, Sandeep Guleria, Jai Prakash, Sunil Shroff, Narayan Prasad, Sanjay K. Agarwal, Santosh Varughese, et al. “NOTTO Transplant Specific Guidelines with Reference to COVID-19.” Indian Journal of Nephrology. 2020;30(4):215–20. Available: https://doi.org/10.4103/ijn.IJN_29_20.
16. Pate, Bhavna Shrirang, Meenakshi Ek Nath Yeola, Atul Gawande, Amit Kumar Singh, and Harshal Atul Tayade. “Best Practices for Endoscopic Procedures in Covid-19 Pandemic.” Journal of Evolution of Medical and Dental Sciences-Jemds. 2020; 9(49):3760–66. https://doi.org/10.14260/jemds/2020/825.
17. Patel, Mohan P., Vivek B. Kute, Jitendra Goswami, and Manish R. Balwani. “Hospitals May Become ‘Disease Hotspots’ for COVID-19 Amid Shortage of Personal Protective Equipment.” Indian Journal of
Critical Care Medicine. 2020;24(11):1145–46. Available:https://doi.org/10.5005/jp-journals-10071-23645.

Singh Kumar Tathagat, Gaurav Mishra, Alok Kumar Shukla, Subasish Behera, Arun Kumar Tiwari, Subhasish Panigrahi, and Kumar Gaurav Chhabra. “Preparedness among Dental Professionals towards COVID-19 in India.” Pan African Medical Journal. 2020;36. Available:https://doi.org/10.11604/pamj.2020.36.108.23694.

Singh, Nihaal, Ashish Prakash Anjankar, and Shivangi Garima. “The Urgent Need to Understand Covid-19 Associated Coagulopathies and the Significance of Thrombotic Prophylaxis in Critically Ill Patients.” Journal Of Evolution Of Medical And Dental Sciences-Jemds. 2020;9(33):2381–85. Available:https://doi.org/10.14260/jemds/2020/516.

Dr. Alink Matez. Trends and the Impact of Physician Shortage on Patient Outcomes. International Journal of Respiratory Care. 2016;12(1):01–05.

Dr. Siren Alopne. ARDS Impact on Patient Quality of Life. International Journal of Respiratory Care. 2016;12(1):06–09.

Arora, Devamsh, Muskan Sharma, Sourya Acharya, Samarth Shukla, and Neema Acharya. “India in ‘Flattening the Curve’ of COVID-19 Pandemic - Triumphs and Challenges Thereof.” Journal of Evolution of Medical and Dental Sciences-Jemds. 2020;9(43):3252–55. Available:https://doi.org/10.14260/jemds/2020/713.

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