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Remdesivir: Boon for Covid 19

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ABSTRACT
BACKGROUND
Coronavirus disease 2019 or COVID19 is the currently evolving pandemic that has grappled the whole world. The efficacy of various drugs which are already in use were tested. Remdesivir is among the most widely used drugs in the treatment of COVID-19.
SUMMARY: Remdesivir is mainly used to treat hepatitis c and recently to contain the outbreak of Ebola. It was re purposed for the treatment of COVID-19. Remdesivir was among the most sought medication for the treatment of COVID-19. Various studies published in reputed journals confirmed its efficacy over the placebo. As the drug got traction, the demand was increased by manifold and people were experiencing supply side constraints. Issues such as black marketing of drug, stealing vials, administration of other drug in the name of Remdesivir was rampant. Also further studies carried out suggested that the efficacy was in question. Various complications related to Remdesivir were unearthed and finally it has been removed from the essential treatment course of the COVID-19.
CONCLUSION: Alternative medication should be used to decrease the dependability on the drug so that price surge can be controlled. Vaccination is the only available and viable option that should be used as widely as possible. Proper study is needed with larger pool and cross country cohort so that tangible evidence can be offered before people. Vaccine timidity should not gain ground among normal people. Comorbid patients can take advices from their family doctor before getting jabbed. Although it has been removed from the treatment course of COVID-19, use in some instances can be beneficial according to the condition of the patient. Therefore one must tread carefully while administering the drug. Wholly abandoning the drug might hamper the fight against the COVID-19.
KEYWORDS: COVID-19, Remdesivir, repurposed drugs, pandemic, emergency use authorization, placebo.

I. INTRODUCTION

Coronavirus disease 2019 or COVID19 is the ongoing deadly pandemic which has affected millions of people around the world. The disease has made the whole world to be at stand still as the transmissibility and capacity of producing lethal clinical outcome is extremely high in COVID-19. No such lethal pandemic had happened in past hundred years of human history. Since its inception in Wuhan city of Hubei province in China, it has spread over the world. Every country is reeling under the pressure of rising case burdens and case fatalities related to COVID-19. As of July 01, 2021, 182,377,702 infection cases and 3,949,761 case fatalities related to COVID-19 has been registered all across the world(1,2). United States of America, India, Brazil, France, Russian federation and Turkey are the worst affected countries having more than half of case infections and fatalities(3). Mutations in novel coronavirus is the recent cause of concern as mutated version of the virus is more transmissible and fatal than the previous version of the virus(4). Many vaccine candidates got approved by health authorities all over the world and vaccination drive is underway. Till date 3,079,875,341 jabs has been administered all over the world. The novelty of the disease was one of the main hindrance in the containment measures as no already valuable treatment protocol could be used to treat the patients of COVID-19. Therefore scientist and researchers started to use existing medications which are used in similar viral outbreaks like in influenza like illnesses and others. Many drugs and therapies were repurposed in order to quickly gain control over the viral pandemic. Therapies such as plasma therapy and medications which includes drugs such as Remdesivir, Favipiravir, Fabiflu and Hydroxychloroquine were widely used to treat the patient(5). Initially it was considered as the one stop solution for seriously ill patients. Many studies have highlighted that medicines like Remdesivir were effective among severe and critical patients that placebo. Its antiviral mechanism also made it talk if the town as no other medications was availa-

ble. It was prescribed all over the world which exponentially raised its demand. As the supply was not at par with demand it did not matched up(6). Rampant black marketing and illicit trade was kick started as relatives of patients were desperately seeking to save their loved ones. Later on WHO advised against the usage of Remdesivir due to inadequate data available backing the efficacy of the drug. Various vaccine candidates are also got approval and now the challenge is to inoculate as many people as possible in least possible time. All these things are comprehensively overviewed in the article.

Pathophysiology And Mechanism Of Novel Coronavirus

Coronavirus disease 2019 or COVID-19 is a virus-related infections and communicable disease caused by novel coronavirus or SARS-COV-2. Novel coronavirus is the descendant in the coronavirus family of SARS-COV which caused the severe acute respiratory syndrome outbreak in 2003. The COVID-19 pandemic is the unprecedented event that has happened in almost past hundred years. The high virulent nature and capacity of producing extremely lethal clinical outcome makes it most deadly pandemic in the human history. More than one hundred million people has been infected by the COVID-19 and of which two million people lost their lives due to COVID-19 related complications. Human casualties at this level in a particular period was not registered in almost past century. Inhibition is the major problem as the virus has immensely fast pace of spreading through the human population. Population density has direct relation with the case load in a particular area. Higher the population density, higher is the case infection in that highly populated area(7).

Novel coronavirus cause the coronavirus disease 2019 which recently crossed the mark of hundred million in infections all over the world. No other disease outbreak was so contagious and lethal as COVID-19 hence it is called as unprecedented situation. The once in a century pandemic has taken more than two million lives from all over the world(8).

Mechanism of the virus somewhat resembles with the SARS-COV, its predecessor. The structure of the coronavirus is crown shaped. It harbours spike proteins which are the main tool for the virus to get in to a cell. Human body contains various angiotensin enzyme 2 (ACE 2) receptors at various organs of the body. ACE 2 receptor are mainly found on cardiovascular system that heart and respiratory system that is lungs. The ACE 2 receptors act as a gateway for the coronavirus and facilitates the entry of the coronavirus in to the cell. The spike proteins gets attached to the ACE 2 receptors which then prohibits the receptors from attaching any other enzyme. The host cell is completely hijacked by the coronavirus and crucial functions of the cell like protein synthesis. Then the coronavirus starts to replicate itself and starts spreading to other parts of the body vial various connective tissue like blood. The incubation period of the virus rages from 2 days to 14 days. Generally the symptom starts to show up after 5 to 6 days and if medical intervention is not done then the person starts to show severe symptoms(9).

REMDESIVIR AND ITS USAGE

Remdesivir is the broad spectrum antiviral medication that is widely used around the world. It is administered through intravenous path. Remdesivir was first manufactured and researched for hepatitis c disease control but later on it is found that the medication was effective in Ebola virus outbreak which was rampant at that time. Use in hepatitis c lagged and West African Ebola outbreak which happened in 2012-2016 made the research work accelerated and Remdesivir was scrutinized to check its efficacy in Ebola outbreak. The drug was then found to be effective in controlling the West African Ebola outbreak. It was also tested for previous coronavirus outbreaks Of SARS and MERS. GS-5734 is another developmental name of Remdesivir(10).

Emergency Use Authorisation Of Remdesivir In Covid-19 Pandemic

Coronavirus disease 2019 or COVID-19 is the novel disease outbreak turned pandemic which started from Wuhan city of Hubei province in china. As the disease outbreak was new, there was no readily available medication in practice. The viral pandemic has created many challenges. Management of COVID-19 was difficult due to unavailability of the medications. Researchers and doctors resorted on ad hoc medications which mostly suited according to ground conditions. As no established medical treatment was in use, many existing drugs were tried to control the pandemic. Medications which are already in use for different purpose and treating variety of disease were the only option. These medications were used in trial and error basis as no prior research was available. Therapies such as plasma therapy, drugs such as Remdesivir, Favipiravir, Hydroxychloroquine and Fabiflu etc. were widely used in COVID-19 patients. Initially the common antiviral drugs were employed in the COVID-19 containment plan, later on ad hoc medicines which showed promising results were also

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included. Already existing therapeutic interventions were repurposed for the treatment of COVID-19(11). Also the similarity of the disease with other anti-viral disease made researchers to use existing anti-viral medications. Remdesivir was among the widely used drug in the treatment of COVID-19. It was mainly administered to the patients which are severely ill and the condition due to COVID-19 has worsened. TO study the efficacy and establish the correlation between efficacy of Remdesivir and its administration in COVID-19, many studies was undertaken so that concrete conclusion can be unearthed. One study conducted in 1062 patients which was double blind placebo controlled randomized trial suggested that the Remdesivir was superior to the placebo. Those patients who received Remdesivir as a medication for COVID-19 had median recovery period of 10 days, on the other hand it was 15 days in case of placebo(12). Among 1062 patients studied, 541 were administered the Remdesivir medication and 521 were given placebo. It was found that the stay in hospital of seriously ill COVID-19 patients were shortened after administration of Remdesivir. Mortality was also found to be less in Remdesivir administered pool of patients which stood at 6.7 percent while it was 11.9 percent in placebo group. The discharge time from the hospital was shorter for Remdesivir group(13). IT was 8 days as compared to 12 days on an average for placebo administered group. The study also suggests that Remdesivir also had stopped the progression in severe respiratory distress situation. All these studies solidified the claim of Remdesivir as a medication for treatment of COVID-19(14).

The hype regarding the usage of Remdesivir created an unprecedented demand for the said drug. Every severely ill patient was prescribed the medications regardless of ground situation and condition of patient. This created a panic wave among the relatives of the patients as the availability of the Remdesivir was low. The demand surged exponentially and supply side constrained made the situation even worse. There was black marketing and illicit trade in Remdesivir as relatives of patients were desperately seeking the medications. Though the medication was not a panacea, it was so hyped that relatives of patients were made to travel hundreds of kilometres to check whether the medication is available or not. In many unfortunate instances, instead of Remdesivir, simple water or glucose was injected into the patient. Thankfully there was no unlikely even registered due to such sinful behaviour. In some cases bogus pharmacists sold fake Remdesivir just to make a quick buck from people's vulnerable situation. People were financially exploited as prices increased multiple times. Also some of the COVID-19 started self-medications. And they self-administered the dosage of Remdesivir which had adverse impact on physiology of the patient. IT was used as it was meant for treatment of COVID-19 which it wasn't. Indiscriminate use, over dose were among common issues relayed to it(15).

Removal From The Essential Treatment Course Of Covid-19

The medication created scare as its unavailability risen. There was a common misconceptions among the patients and their relatives that the Remdesivir is the sure shot medication for the treatment of COVID-19. Patients and their relatives were asking upfront the dosage of Remdesivir to the doctors as they thought that it can cure the disease at one go. Doctors and other medical professionals were experiencing no significant improvement in the patients. On the other hand, some patients started showing consequences such as kidney and liver related impairments post medication. There were some harm and less to no improvement in the patient and demand supply mismatch also created environment for reconsidering the decision. World Health Organisation already warned in November 2020 about the inadequate studies about the efficacy of Remdesivir. The drug is not meant for the treatment of the COVID-19. Over use can create complications in some patients which can be difficult to manage. These complications arising out of wrong or over medication can sometimes be fatal for the patient. Some observational studies which needs empirical backing suggests that it can elevate the enzymes in liver which can accelerate the liver damage. Other common but not life threatening side effects includes nausea and vomiting. There is no precise dosing regimen but generally at the initial stage one shot of 200 mg is followed by 10 single shot each day of 100 mg for 10 days. It is quite costly treatment especially in middle and lower income countries(16).

In some instances, Children below 15 years who got infected with COVID-19 and of seriously ill condition were approved to be given the shots of Remdesivir. NO adverse reaction was seen as first wave saw minimal impact on kids and adolescents. Very few cases were of severely ill category. Therefore hospitals got approval for usage of Remdesivir. But recently as the guidelines are being revised and the Remdesivir has been removed from the treatment protocol of the adult population, it also has been advised that it should not be used in the treatment of COVID-19 in kids too. It can potentially harm, have limited to no efficacy and it's

expensive. Proper training of nursing staffs to identify the safety mechanism on the vials of the medications is being done to ensure foolproof plan. Initially it was thought that Remdesivir is the desired medicine for severe patients of COVID-19(17).

Possible Third Wave And Vaccination

The second wave presented some fiercest picture of the pandemic. Patients were literally gasping for air as there was complete collapse of health care infrastructure. It presented the grim scenario of the pandemic which was disheartening. After the dull phase, the mutant version started gaining traction. IT was more transmissible and lethal. Therefore it spread faster and created more complications than previous wave. The resurrection in cases is also attributed to lowering of guard when cases were on downfall in the late last year and early this year. The third wave is meant to be more lethal for the kids and adolescents. Various vaccine candidates for this section are under trial phase and some of them are being administered on trial basis. If proper care is taken and all the COVID-19 appropriate behaviour is followed then the possible third wave can be averted from happening. Also various repercussions attached to COVID-19 such as condition of LONG COVID-19, psychological impact which are often underestimated can be avoided by following preventive measure and taking vaccines. The more number of people is vaccinated, the stronger should we make against the third wave. Building health care infrastructure for paediatric population such as paediatric ICU and neonates ICU can be a best step to take in the current scenario. In one study, it is claimed that there is no point inoculating the infected person recuperated from COVID-19. The antibodies concocted by the body are extremely effective and are superior to the vaccine induced response. It lasts or 4 to 6 months after infection. Therefore those who are not infected should get priorities so that majority of the populace is protected from the infection.

II. CONCLUSION

COVID-19 is far away from being over. Hence one should be extra cautious about her or her behaviour whether it is COVID-19 appropriate or not. As far as Remdesivir is concern, it is out from the list of medications and is now rarely used and prescribes. But still many patients and relatives are requesting its usage regardless of any knowledge towards it. Therefore it is the duty of the doctor or medical professional in charge to give proper information about the medication so as to quench their thirst of knowledge about the medications. Strict action should be taken against the persons doing illicit trade in these lifesaving medications as these can cause harm to another person's life. Consuming such fraudulent medicines can life threatening. Proper bar coding or other safety mechanism should be at place to detect any misbehaviour. Although it is out from the essential treatment protocol, it can be administered as and when required after due consideration by competent medical professionals. Over usage of the drugs must be avoided at all cost. The complications and side effects needs to be studied more so that more precise guidelines about its usage can be framed. Especially the elevated production of liver enzyme must be monitored who got dose regimen of Remdesivir as it lead to complex medical situation. Vaccine hesitancy must be dealt with awareness campaign and no person should left unvaccinated.

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