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Meeting Challenges of the Pandemic, a fight against SARS-CoV-2

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Abstract

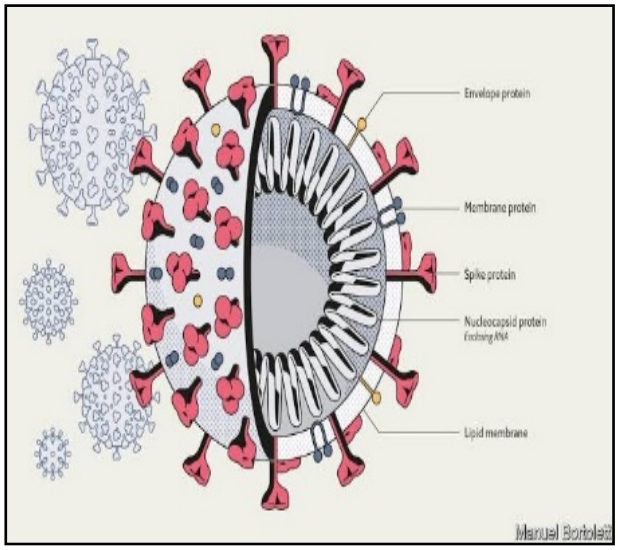
The present paper deals with SARS CoV-2, Corona Virus and suggested preventive measures.

Keywords: Corona Virus, Challenges, Preventive Measures, COVID-19

Introduction

'Corona' in Latin means 'halo' or 'crown.' The name 'coronavirus' comes from the crown-like projections on their surfaces. Coronaviruses have a protein body and a fatty covering with spike like projections. It can mutate effectively, which makes them so contagious and uncontrollable.

The first Corona Virus that affected live stalk was found in 1937, however, human corona virus was first found in 1960. Coronaviruses are types of viruses that typically affect the respiratory tracts of birds and mammals, including humans. Doctors associate them with the common cold, bronchitis, pneumonia, severe acute respiratory syndrome (SARS), MERS, and COVID-19. They can also affect the gut.Over the last 70 years, scientists have found that coronaviruses can infect mice, rats, dogs, cats, turkeys, horses, pigs, and cattle. Sometimes, these animals can transmit coronaviruses to humans.



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(figure I) adapted from illustration by Manuel Bortoletti.

There are seven strains of Corona virus found so far, out of which two OC43 (beta coronavirus) and 229E (alpha coronavirus) are common for causing cough and Cold and everyone gets them at least once in their lifetime. However, two of them are less common, but are known to cause deadly disease, namely MERS (Middle East Respiratory Syndrome) and SARS (Severe acute respiratory syndrome). The recent finding of Novel Corona Virus (SARS-CoV-2) is very different. It is not only fatal; it has no known treatment.

Among humans, coronavirus infections are most often and occur during the winter months and early spring. People regularly become ill with a common cold due to a coronavirus and may catch the same one about four months later. This is because coronavirus antibodies do not last for a long time. Also, the antibodies for one strain of coronavirus may be ineffective against another.Corona virus is not new (Adam F., 2020).

COVID-19 Outbreak:

In 2019, the Centres for Disease Control and Prevention (CDC) started monitoring the outbreak of a new coronavirus in Wuhan, China, SARS-CoV-2, which caused the respiratory illness. It has now spread in other parts of the World, leading WHO to declare this as a Pandemic. It has the name: Coronavirus disease 2019, or COVID-19. With no sure treatment or control over its spread, coronavirus has been topic of worries. The only thing that seem to be working are social distancing and general lockdown, which again are not proving to be very effective. Today, the bigger worry is ever increasing COVID-19 cases and the death toll.

In the five thousand years' History of Mankind, Coronavirus is proving to be biggest Pandemic ever. The disease is not only highly contagious, but at the same time the Virus has tremendous capacity of mutation. This has compelled many researchers all over the globe to go deep into its study to find a cure for it.This paper aims at focusing on COVID-19 and measures for its prevention.

Suggested Preventive measures:

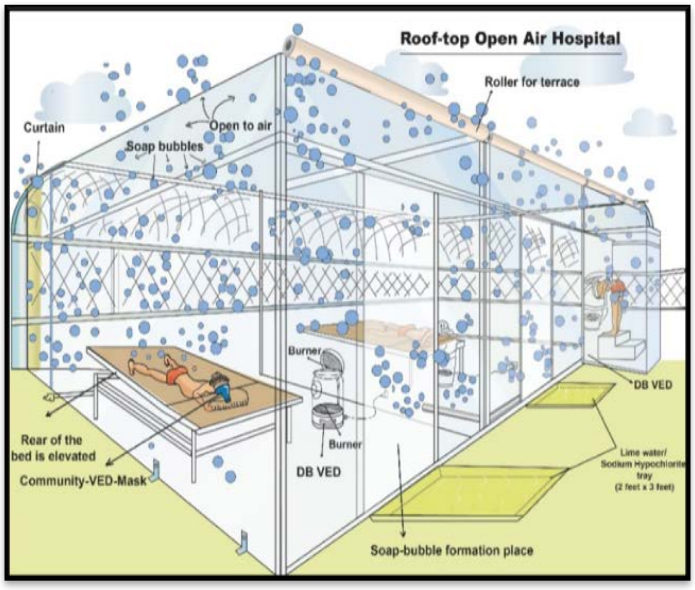
Being a designer, I believe that we need to change our approach to deal with this storm.

Target:

1. Reduce pathogen load from the system of a patient, to increase his recovery chances.
2. Sanitize everything around, including the exhaled air by a corona positive person, both carrier and patient, to make it pathogen free and ensure a contamination free environment.

Keeping this in mind I have made a five-point programme for this

1. Roof-top open-air hospital:



An open-to-air hospital preferably in a countryside or on a rooftop will be a good solution to deal with the problem of Aerosolization and spreading of the virus.The Idea behind is to use UV-rays from the SUN and Soap bubbles for sanitization of Area

The Sun, with its all UV-Rays can disintegrate any Virus, whereas Soap bubbles will also help in sanitizing the air. There are provisions for a movable Roof, and curtains to deal with the excessive heat. Cool Soap bubbles will also contribute in cooling the area. There will be lime water/ Sodium Hypochlorite pits, seen as tray in the figure II at the entrance of each cubicle. One

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control room among four cubicles will have all equipment like ICU monitor etc.

(figureII) The Concept and Illustration by the Author

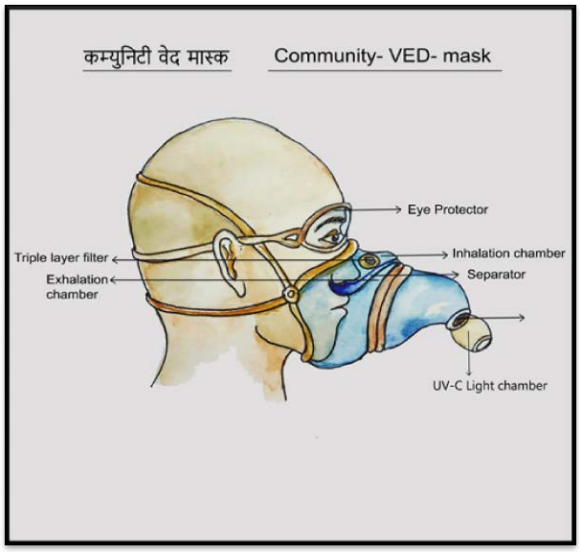
There will be UV-C Light system in each cubicle which will mainly be functioning in the night for five minutes every one to two hours to sanitize the cubicle in absence of Sun Rays.

2. Change the Mask:

In the present situation the masks, those are available, function in a way that the air which is inhaled may be filtered; however, while exhalation, the same mask prevents an infected air to go out of the body. In fact, the patient with a proven infection in the Respiratory Tract will have to swallow/inhale the active pathogen back in the system, whereby increase the load of the Pathogen in his own body.

Another disadvantage is possibility to contaminate the inhaled air with the exhaled air. In fact, the patient is never able to inhale a totally infection free air. Some portion of the earlier infected exhaled air re-enter the system.

I have designed a special mask for it, called



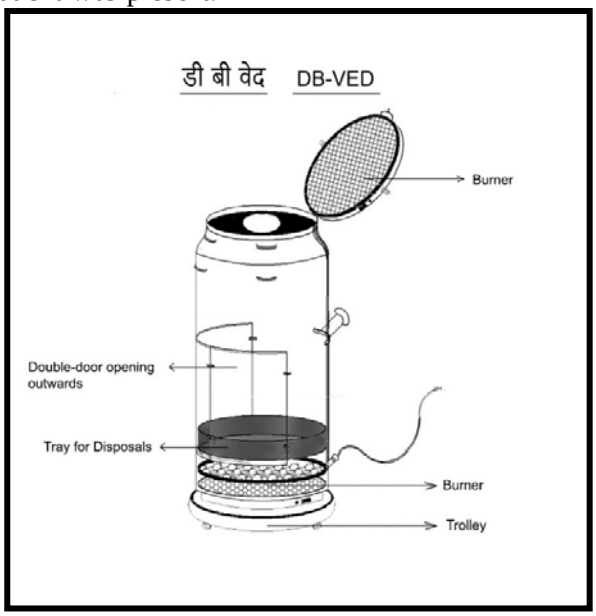
Community-VED-Mask. It has two separate chambers, designated as one for inhaling and another for exhaling. The air inhaled through Inhalation chamber will pass through a triple layered filter, ensuring infection free inhalation. The other chamber of the mask is used to exhale the air. The exhaled air passes through a burner, which will work to electrocute/burn the pathogens and hence, there stands no possibility of contamination of the exhaled air.

The throwing out, of the pathogen, will also reduce the load of the infection from the patient's system. There is a provision of providing a UV-C light at the apex of the Mask, which will double ensure Pathogen free exhalation. Even if the patient uses the exhaling chamber for inhalation, there will be a pathogen free inhalation too.A turn given at the Apex of the mask will also prevent face of the patient to have a direct exposure to UV-C.

(figureIII) The Concept and Illustration is by the Author

1. 3. DB-VED (Virus Electrocuting Device):

Sneezing and coughing are natural phenomenon meant to throw out any foreign body out of the respiratory system, but how was it possible for a Coronavirus patient to do so, as it may cause infection in whole of the ward, or where ever the patient was present.



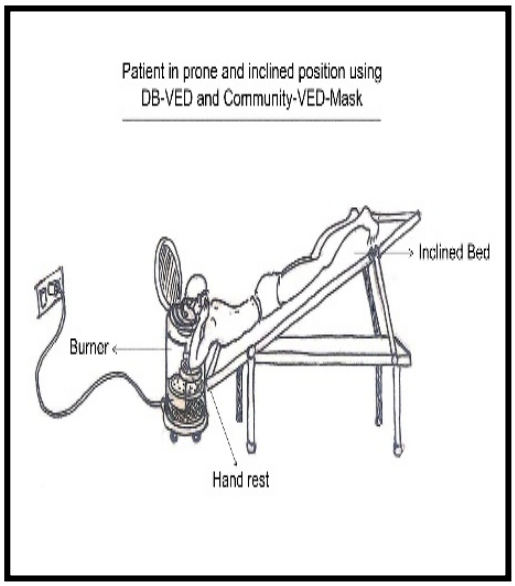
I have designed a special Virus Electrocute Device, the DB-VED, equipped with a couple of hot plates. The sneezing or coughing can be done by lifting the upper burner-lid of the device and placing the head onto the mouth of the device (which provides enough protection from leaking of the virus) and complete the process on the hot plate installed inside. If the process is repeated

many times a day, there are better chances of recovery as it will lead to fabulous reduction of virus load.

The DB-VED is such designed that it can also be safely used for spontaneous sanitization of tissue papers and other hospital waste.

The DB-VED can also be used for giving steam inhalation or similar treatment to a patient.

(figureIV) The Concept and Illustration is by the Author

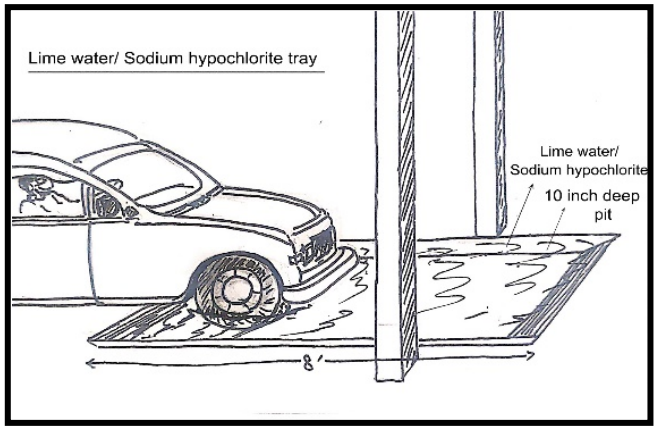


4. Clean Shaved Patient with Minimum or No Clothing:

A patient should be clean shaved while admitting to such an open-to-air cubicle Hospital with minimum or no clothing (as the clothing may become a carrier for the virus) and hence, it might help in spread of the disease. A bare-body patient will have good sunbathing (enough care will be taken to prevent severe sunburn or dehydration).

The patient may be administered with mucolytic and **(figure V) The Concept and Illustration is by the Author** muco-kinetic agents and put into an inclined prone position to ensure movement of mucus from lungs towards trachea to facilitate in throwing out of sputum on to the burner plate, which will take care to spontaneously sanitize it. This should be done in medical supervision and well control manner (depending on the tolerance capacity of the patient) for 5 to up to 10 minutes.

5. Lime water/Sodium Hypochlorite disinfection



The footwear of a visitor or a vehicle tyre may become a carrier for coronavirus or other pathogens. This can be prevented with lime water or Sodium hypochlorite pits at both entrance and at the Exit of the facility and the patient's room. Similar pits are suggested for cars or other vehicles' tyre treatment on the campus entrance.

(figure VI) The Concept and Illustration is by the Author

Conclusion

This Article is written at the time of ongoing Pandemic of COVID-19 due to Sars-Cov-2. Many methods and Medications have been tried with little success. I have gone into an out of box thinking to suggest above five method, which I am sure, will not only help to control the mortality of COVID-19 patients by attempting to reduce pathogen load from these patients, but also to break the continuous chain of the spread of this Novel Coronavirus.

There cannot be a pattern decided or suggested for time of any Pandemic or Epidemics, but as the study goes and keeping into mind the mutation capacity of the present Virus, I find my hypothesis and suggested improvement to be capable of helping in handling present and all the situation that might be faced in future as well. The five improvement methods suggested here are over and above the regimen adopted by individual Medical Authority and are not independent treatment to the disease. They may be taken as helping hand in the present and future scenarios.

The five changes and improvement suggested also have scope of improvement and alteration if suggested by competent researcher, for which the author is open and ready to discuss.

Acknowledgment
Many people and Medical Professionals have appreciated and agreed to my above hypothesis. I would sincerely like to express my gratitude to some of those doctors for motivating me throughout this research.

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