Available online at www.ijpab.com

DOI: http://dx.doi.org/10.18782/2582-2845.8757

ISSN: 2582 – 2845

Ind. J. Pure App. Biosci. (2021) *9*(4), 50-53

Indian Journal of Pure & Applied Biosciences

Peer-Reviewed, Refereed, Open Access Journal

Review Article

Herbal Medicine for the Treatment of Coronavirus Disease 2019 (COVID-19): A Systematic Review

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Received: 16.06.2021 | Revised: 20.07.2021 | Accepted: 27.07.2021

ABSTRACT

Till now Coronavirus (COVID-19) has taken ~ 0.43 million lives and infected ~ 7.6 million people and the process is continuing. Face masks and regular hand-washing are the two main ways to help prevent the transmission of Coronavirus. But wearing face masks and regular hand-washing have not sufficient to stop the transmission of Coronavirus. This leads a modification needed for the procedure of prevention from Coronavirus infection. Thus the knowledge about spreading and infecting mechanism by the Coronavirus is desired (Garai, 2020). Instead of using soap and alcohol base sanitizer $NaHCO_3$ solution can used for hand-washing to prevent from Coronavirus infection. As $NaHCO_3$ is very cheap and less hazardous than soap and alcohol base sanitizer so this change will be economically profitable and environmentally safer (less hazard). $NaHCO_3$ solution can also be used as nasal drop and gargle solution for the protection of nose mucus and mouth saliva from Coronavirus infection. Thus $NaHCO_3$ solution give extra protection from Coronavirus infection when it used with mask (Garai, 2020). Beside that considering the biological immovability of $NaHCO_3$ (mainly in human blood plasma), it is strongly recommended to use $NaHCO_3$ for the treatment of Coronavirus patients too.

Keywords: *Coronavirus, COVID-19, Chemistry, Public health, Protection, Prevention.*

INTRODUCTION

There is no medicine or vaccine till now to treat Coronavirus. Hand washing with soap, face mask wearing and maintaining the lockdown (social distancing) are the cumulative ways to defeat Coronavirus infection. Butfollowing these instructions are not enough to stop spreading of COVID-19 infection. Thus it is the time to improve the technology of prevention from COVID-19 i.e. to think an alternate way of prevention.

Lockdown usually break the backbone of countries economy and also human freedom to work. From a chemist viewpoint to play with Coronavirus, effect of pH on Coronavirus is need to be understand.

Cite this article: Ahmad, R.S. (2021). Herbal Medicine for the Treatment of Coronavirus Disease 2019 (COVID-19): A Systematic Review, *Ind. J. Pure App. Biosci.* *9*(4), 50-53. doi: http://dx.doi.org/10.18782/2582-2845.8757

Air is generally acidic in nature having pH 5.7 as small amounts of carbon dioxide dissolved in water which makes it slightly acidic. It means Coronavirus survive in acidic condition. Air is always acidic whether it is summer or winter, humidity is high or less. Only carbon dioxide concentration in air has important role on Coronavirus. Humidity have slight effect to pH value of air. Now a days many countries started bleach the infected area to kill it. The main ingredient in bleach is sodium hypochlorite (The pH value of 5% bleach solution is around 11). Soap solution has a pH 9 also kill the virus. Thus any basic solution can kill the virus but experimental study needed to find out the minimum pH at which Coronavirus died. In human body there are several organs those change their pH for their activity. It is well known fact that hemoglobin affinity for oxygen is the ability of hemoglobin to acquire and release of oxygen molecules into the fluid that surrounds it. This mainly depends on the pH value of blood. Besides that lungs, liver, kidneys, muscle and other organs need definite pH to act. Coronavirus attack those organs where the pH values are compatible with Coronavirus survival. If pH values of those organs are not suitable for its existence, then Coronavirus tried to decrease the pH values of those organs.

Coronavirus has a size about 50-200 nm when enter into human body shows several symptoms like fever, cough, shortness of breath or difficulty breathing, chills, repeated shaking with chills, muscle pain, headache, sore throat and new loss of taste or smell (Borges do Nascimento, 2020, Geier & Geier, 2019, Kieliszek & Lipinski, 2020, Derwand & Scholz, 2020, & Borges do Nascimento, 2020). In human body several organs are pH dependent i.e. lungs, kidneys, stomach, blood, muscles, tongue (saliva) etc. need a particular pH for their functioning. The pH value at which lungs, kidneys, stomach, blood, muscle and tongue (saliva) work are 7.38-7.42, 7.4, 1.5-3.5, 7.35-7.45, 7.1 (living) and 7.4 respectively. Symptom arise when the above mention pH values of that organs differ from its working pH value and the symptom become mild to severe depending on the amount pH change. All the symptoms for Coronavirus infection may be due to the pH change of different organ namely difficulty breathing due to blood pH change, muscle pain due to muscle pH change, loss of taste due to mouth (saliva) pH change and so on.

It is very tough to study the properties of the 80-160 nm particles in terms of time and funding. If it is virus then the study become more challenging because of handling and infection. Thus hypothesis receive greater interest for this type of study.

Main Text:

Good immune persons have not affected or affected with mild symptoms (asymptotic) but weaker immune persons are prone to infected by Coronavirus. There are no device to measure the immunity of a person and thus cannot differentiate between lower and higher immune person, leads all persons under lockdown. To find the measurable term of immunity pH measurement (Robinson et al., 1962, & Cullen & Earle, 1928) of different organs may help. Human mouth saliva has a pH in the range of 6.2-7.6 and the nasal mucosal pH has about 5.5-6.5, and increases in rhinitis to 7.2-8.3. Coronavirus will prefer entering through nose rather than mouth. Thus nasal mucus pH measurement have vital role for Coronavirus infection and it may be a measurable entity to define low and high immune persons. Measurement of urine pH value also give idea to enrich the explanation.

In acidic pH the Coronavirus is alive and active but in basic pH it died (as we wash our hand with soap to kill it). The scenario in blood is also same. Blood has a pH range 7.35-7.45 (slightly basic). Our hypothesis is that to stay alive in human body the Coronavirus needs adequate pH value. When a human is infected by Coronavirus, transfer a signal to cell to change blood buffer components. When Coronavirus able to change blood buffer components, acidosis occur (this type of acidosis is differ from three main root causes of reported metabolic acidosis i.e. increased acid production, loss of bicarbonate, and a reduced ability of the kidneys to excrete

excess acids). This explain the symptoms like shortness of breath or difficulty breathing and pneumonia. Thus there is a competition between Coronavirus and immune system of human body to change the pH value. When human body immune system is able to keep the pH value of different organs intact then human body survive but when Coronavirus is able to change the pH value of different organs human died. According to Bohr Effect, hemoglobin need higher pH to pick up oxygen from lungs. As Coronavirus decreases the effective pH value (it will differ than measured) of blood so hemoglobin is unable to bind oxygen i.e. at lower pH, hydrogen ion concentration increases thus CO_2 level also increases and hemoglobin has less affinity to bind oxygen. The conversion of dimer and tetramer form of hemoglobin is reversible at balanced pH value. Again when the pH value is more acidic (<6.5) the dimer form of hemoglobin further dissociate to monomer and then iron come out from hemoglobin and deposited elsewhere.

When a person is exposed in Coronavirus environment, actually the person exposed mainly skin, eye, nose and mouth. The average pH value (Draize, 1941, & Jolly et al., 1960) of maximum body skin (human epidermis) is 5.5 except hand palm (right palm pH = 5.85, left palm pH = 5.88), hand dorsum (right hand dorsum pH = 5.85, left hand dorsum pH = 5.90), foot dorsum (right foot dorsum pH = 5.63, left foot dorsum pH = 5.64), right plantar ball (pH = 6.7) arch (pH =5.66), left plantar ball (pH = 6.75) arch (pH = 5.57) and neck-upper back (pH = 5.65) (Jolly et al., 1960). May be the pH values of different parts of hand palms help Coronavirus to enter into human system.

Those medicines which mainly keep the pH values of those organ to function give freedom from Coronavirus. Researcher found that smoker is less prone to infect than non-smoker. Coronavirus is acidic in nature and died when it comes in contact with basic environment. Nicotine is a weak base (alkaloid) of a pKa value 8.0 and a half-life of around 2 hours. Thus in same Coronavirus loading smokers get extra benefit than non-smokers because basic nicotine will give extra protection for prevention. But nicotine is dangerous can lead an increase in blood pressure, heart rate, flow of blood to the heart and a narrowing of the arteries. Instead of nicotine $NaHCO_3$ (one component in human blood buffer) can be used (Garai, 2020). $NaHCO_3$ is not dangerous as nicotine but able to give extra-protection when Coronavirus enter through the nasal mucus and mouth. Thus a drug which can maintain the pH values of all organs will be the answer of COVID-19. Thus our protocol is $NaHCO_3$ tablet/solution can be used orally and or injection for treatment COVID-19 patients. To keep sodium and potassium ions balanced in human body a mixture of $NaHCO_3$ + $KHCO_3$ with proper ratio and dose may be given. It may lower the severity condition of patients and mortality can also be diminished even stop.

CONCLUSION

In conclusion we proposed a way to distinguish between the people of low and high immunity on the basis of pH measurement. This is converting immunity to a measurable quantity. Then it is easy to predict who should care more and who will go outside for work. Thus we do not need complete lockdown, peoples can still work for the betterment of country.

The pH value of freshly prepared aqueous solution of $NaHCO_3$ are 8.3 (0.1 molar) and ~9 (saturated solution). Both soap and $NaHCO_3$ solution have comparatively similar pH value and show similar performance on Coronavirus. As $NaHCO_3$ is very cheap and less hazardous than soap and alcohol base sanitizer so this change will be economically profitable and environmentally safer (less hazard). $NaHCO_3$ solution can also be used as nasal drop and gargle solution for the protection of nose mucus and mouth saliva from Coronavirus infection.

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