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THE CLINICAL MANAGEMENT OF COVID-19 WITH AYURVEDIC HERBAL FORMULATIONS: PROMISING HOPE FOR BETTER HUMAN HEALTH

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ABSTRACT

COVID-19 suddenly emerged as the worst health crisis for the people worldwide in December 2019. Its pathological complications made humans helpless and opened the biggest doors of death. These altogether culminated in the form of a death storm and the whole world was lamenting like an orphan kid. In this paper, we have discussed all the facts related to corona such as its origin, history, pathogenicity, treatment and how herbal formulations are superior to synthetic drugs. Neither the preventive measures nor the therapeutic efforts could resolve the panic of this dreaded disease. In such a turmoil condition, vaccines paved the path of security from this disease, however, their inherent complications forced us to look for better and safer alternatives. For such alternatives, innocuous and pro to body concepts of clinical management of this disease, we decided to go for better and clinically effective alternatives- ayurvedic way of therapy. Further, we intended to review the types of herbal formulations routinely used to contain the infection and combat this disease. Simultaneously, it is also attempted to evaluate the health impacts of synthetic drugs and the superiority of ayurvedic formulations for human uses. Additionally, we have searched the literature to establish a relationship between the Rasayana Mode of Therapy for boosting the inbuilt immunity and thereby minimising the chances of getting sick and damaged by corona virus.

Keywords: Corona virus, COVID-19, pathological complications, human health, ayurvedic herbal formulation

INTRODUCTION

The most dreaded and highly contagious virus- corona is a single stranded RNA virus from the family Coronaviridae. This virus has mounted one of the most disastrous and serious pandemic threats for the health of human beings across the world in the last many decades (Awadasseid et al., 2021). The human corona virus was identified, for the first time, during 1960 (Awadasseid et al., 2020). Significant to mention that recent outbreak of COVID-19 was caused by corona virus and observed as the most fatal pandemic with extreme degree of lethality globally. Corona virus is a well-known serious cause of Severe Acute Respiratory Syndrome (SARS) and is, henceforth, named as SARS- CoV2 with previous name as 2019-nCoV. The consequential inherent dangers of COVID-19 pandemic forced the people worldwide to go below the knee helplessly in the death storms of corona pandemic fatal and detrimental waves. Such situational realities attracted the global attention and perusal with the most intensified concerns.

It is minute in size with 65–125 nm in diameter, size ranges from 26 to 32 kbs in length. It is a highly mutating virus and spreads very fast. This virus is highly contagious and targets mainly the respiratory system and related organs (Wu et al., 2020 and Awadasseid et al., 2020). Awadasseid et al. (2020) reported that besides others, the acute lung damage and acute respiratory distress syndrome (ARDS) are the pathological reflections of Middle East respiratory syndrome corona virus (MERS- CoV). It further causes pulmonary failure and culminates in fatality. (Zhang and Kutateladze, 2020). This virus is known to spread through droplets, sneezing, coughing, touching, handshaking, needles etc. and entered the air on breathes, talks, laughs, sings, coughs or sneezes of an infected person. That is why preventive measures like mask-wearing, hand hygiene and physical distancing are mandatory for preventing COVID-19. The World Health Organization (WHO) confirmed the death of over three million people and more than 244,000 fatalities globally with an ever-increasing trend of COVID-19. As specific treatments

and vaccines for COVID-19 are yet to materialize, adopting precautionary and hygiene measure is crucial in curbing down the human to human transmission of virus**.** The name corona is logically conferred to this virus of Nidovirales order, due to its crown like spikes present on the outer surface of this virus. Within the corona virus family, subgroups include alpha (α), beta (β), gamma (γ), and delta (δ) corona viruses. While certain human corona viruses like HCoV-229E, HCoV-NL63, HCoV-HKU1, and HCoV-OC43 typically result in mild respiratory infections, zoonotic strains such as Middle East respiratory syndrome corona virus (MERS-CoV) and severe acute respiratory syndrome corona virus (SARS-CoV) exhibit higher fatality rates. In late December 2019, a cluster of patients presented with pneumonia of unknown cause, subsequently identified as a novel virus (Rahman & Sarkar, 2019)

The first case of COVID-19 was reported on December 1, 2019, with the new corona virus later named SARS-CoV-2 originally considered as the SARS-CoV-2. (Cui et al. 2019 and Lai et al. 2020) This virus originated in animals but mutated to cause illness in humans. Previously, viruses like SARS-CoV in 2002 were thought to only infect animals, until a severe acute respiratory syndrome outbreak occurred in Guangdong, China. In December 2019, sea food market of Wuhan city, a key business center in China, experienced an outbreak of a novel corona virus that resulted in many deaths and infections within a short time frame. Treatments for COVID-19 vary depending on the severity of the infection, with milder cases often managed with rest and medication, while more severe cases might require hospitalization with treatments like intravenous medications, supplemental oxygen, and assisted ventilation. The number of death due to corona and infection of corona varied globally worldwide in different geographical conditions (Lundstrom et al., 2020). There are approximately 30,000 RNA bases present in SARS-CoV-2 genome.

Global crisis of corona

The SARS CoV-2 outbreak was labeled as a Global Health Emergency by World Health Organization on January 30, 2020 and later on escalated to a worldwide pandemic on 11 March, 2020 (Zhang and Kutateladze, 2020). Keeping in mind the prevailing situations, WHO issued advisory to all the countries for implementation of strict lockdown, social distancing and quarantine measures to contain the spread of highly contagious corona virus (Wang et al., 2020). Since the first reported case of COVID -19 in December 2019 from Wuhan city, China to till March, 2020, the virus grabbed in its bloody claws around 213 countries, infecting 5 million people and causing nearly 400,000 deaths. All these panic situations were caused inspite ample efforts put in to contain the infection and combat the disease. The International Committee on Taxonomy of Viruses, (ICTV) named initial Wuhan corona virus 2019 novel corona virus as SARS-CoV-2 and the disease COVID-19 (Wang et al., 2020). The first case of COVID-19 was reported in India from a student of Kerala on January 30, 2020, right after his return from Wuhan city in China (Ministry of Health and Welfare, 2020). The COVID-19 positive cases were recorded more than 37,000 till May 3, 2020 throughout India. Except for the first 3 cases of COVID-19 from January 30 to February 3, 2020, no confirmed COVID-19 cases were reported for nearly a month. There occurred an exponential growth in the number of COVID-19 patients from March 20, 2020, onwards and it was indeed considered as the catastrophic corona first wave which remained till May end. India has seen a sharp increase in the number of daily COVID-19 cases nationwide. With a population of around 1.3 billion people, 17,615 confirmed cases were reported in India after 80 days from the first case in Kerala (Ministry of Health and Welfare, Govt. of India, COVID-19). Countries like United States of America, Spain and Italy witnessed more number of COVID-19 cases in the similar time frame (Omer et al., 2020). Though conducted fewer tests for COVID-19, its lower case numbers may also be attributed to early preventive measures taken by Govt. of India such as a nationwide strict lockdown starting on March 25, 2020. Speculations about reasons for India's relative success include early travel bans, Bacille Calmette-Guerin vaccination, exposure to malaria and antimalarial drugs and the effects of hot and humid weather on slowing the viral transmission. However, these theories lack solid evidence, though clinical trials are being conducted to explore their validity (Zhou, 2020). Nonetheless, the health, socio-economic and environmental sectors were seen adversely affected across the globe. Surprisingly, however, Negi and Tripathi (2020) reserve the opinion that corona caused COVID-19 also serves as an environmental vaccine in mitigating the environmental crises of almost all types including the detrimental effects of anthropogenic interventions.

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Pathogenicity

The pathogenicity of COVID-19 was examined through various factors such as cytokine storms, reduced ACE2 expression and complement pathway activation causing micro vascular damage and clotting (Rothan and Byrareddy, 2020). Efforts to improve clinical outcomes for COVID-19 are aimed at targeting these pathogenic mechanisms with a focus on antiviral strategies. These strategies include inhibiting viral RNA synthesis, replication and binding to human cells, along with blocking the self-assembly of virus (Mei and Tan, 2021).The SARS-CoV-2 virus contains several structural and non-structural proteins, with specific proteases enzymes essential for viral replication being potential targets for antiviral drug development (Mohamadian et al., 2021).The S protein, crucial for virus attachment to host cells, is a key target for vaccine and drug development(Momtazi-Borojeni et al., 2021).The process of developing new therapeutic agents is lengthy and costly, involving several stages from discovery to clinical development (Liu et al., 2020).

Signs and Symptoms of COVID-19

Symptoms of COVID-19 include cough, fever, shortness of breath, body aches, sore throat, loss of taste or smell, diarrhea, headache, fatigue, nausea, vomiting, and congestion. While some people may have mild or no symptoms, COVID-19 can also lead to serious health complications like respiratory failure, lasting damage to the lungs and heart, nervous system problems, kidney failure, or even death (Wu et al., 2020).

Treatment of COVID-19 with synthetic drugs

Treatment of COVID-19 with synthetic drugs has been explored through antiviral therapies previously used for similar viruses like SARS and MERS. Despite lots of efforts made, there is still no effective antiviral drug for COVID-19. Further, these drugs were also seen causing adverse side effects. The vaccines have been found in providing effective protection but some inherent complications could not allow us for their frequent uses. In such a situation of complications to clinically manage COVID-19 with a sufficient degree of satisfaction and safety, it appears mandatory to look for certain alternative ways of treatments including natural killer cells, stem cells, immunotherapy and ayurvedic herbal medicine. Further, these are being studied alongside with the current antiviral drugs (Ugurel et al., 2020 and Unni et al., 2020). A new look into the process of rediscovering the plant medicines, Ayurvedic herbal medicines have shown promising results in speeding up the drug discovery process, reducing development time and costs (Luo et al., 2020). Hydroxychloroquine and Remdesivir have been approved by Food and Drug administration, U.S.A. (FDA) but their effectiveness remains debatable (Colson et al., 2020). The new strategies for developing better, safer and widely acceptable therapeutic molecules as drugs, for the treatment and clinical management of COVID-19, are quite crucial and cumbersome including the development of effective therapeutic delivery methods and vaccines to combat the virus and save human lives.

Side effects of synthetic drugs

The treatment related uses of synthetic/allopathic drugs in COVID-19 patients have shown damaging effects on various systems and organs of the body. The COVID-19 patients, suffering from cardiovascular complications, were treated with the drug- heparin and severe complications were observed as compared to other drugs (Tejera et al., 2020). Further, chloroquine, used for the treatment of COVID-19 patients, caused more side effects on the immune system. These drugs frequently used for the cure of COVID-19 patients mount more toxic effects on hematopoietic and cardiovascular systems. Ribavirin, has the highest rate of side effects in cases of thrombocytopenia, dizziness, acute bronchitis, aspergillosis, anosmia, neutropenia arthritis. The side effects of Methotrexate, Prednisolone, Folate, Omeprazole and Lisinopril, when used together with Chloroquine, are marked with the highest rate of adverse drug reaction (ADR). Thrombocytopenia and dizziness are frequently experienced by COVID-19 patients treated by different drugs together with ribavirin (İrfan et al., 2020).

Vaccines in the clinical management of COVID-19

Since the emergence of COVID-19 pandemic, extensive research were conducted both in developing and developed countries for clinically efficacious vaccines to combat the severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) infection (Polack et al., 2020). While current preventive measures include social distancing, mask-wearing and hygiene practices, the introduction of vaccines is crucial in ultimately

eliminating the disease and returning to normalcy. Effective vaccines are needed to generate long lasting protection against SARS-CoV-2, reducing the associated morbidity and; mortality (Voysey et al., 2021 and Krammer, 2020). There are numerous vaccines in various stages of development utilizing different technologies to stimulate the immune system and create immune memory. The COVID-19 vaccines available have shown great promise and it is recommended that eligible individuals receive their doses at the appropriate interval to contribute to diminishing the pandemic.

Adverse effects of vaccine

Adverse effects of vaccines, even mild or moderate ones, indicate that the vaccine is effective but mounting side effects. Interesting to mention that everyone responds differently upon exposure to vaccine. Further, common side effects of COVID-19 vaccines are typically mild to temporary having symptoms like pain at the injection site, fever, fatigue, headache, muscle pain, chills and diarrhea. Severe allergic reactions with less side effects were closely monitored by the health authorities (Cirillo, 2021). Side effects are commonly realized within the first few days of immunization. The over grown serious concern of people regarding post vaccination effects in human beings getting sick with the administration of COVID-19 vaccine is refuted out rightly simply because none of the approved vaccines contain the live virus causing COVID-19. Usually, Vaccines are safe, and getting vaccinated will help protect you against COVID-19.

Clinical management of COVID-19 using herbal formulations

The use of herbal formulations for the clinical management of COVID-19 has shown promising results in alleviating the symptoms of the disease (Ang et al., 2020). Herbal medicines are effective in reducing the risk of COVID-19 when used in combination with modern medicine. Various herbal remedies like *Gymnanthemum amygdalinum, Azadirachta indica, Nigella sativa* and *Eurycoma longifolia* have shown potential antiviral and immuno potentiating properties that can offer support in managing the disease (Panyod et al., 2020). Additionally, traditional remedies like garlic, onion and peppermint have been used historically for various health conditions and may have beneficial effects in combating COVID-19. *Glycyrrhiza glabra*, known for its glycyrrhizin compound, has been found to inhibit the replication of corona viruses, showing the possibility of developing an alternative treatment remedy (Xu and Zhang, 2020). Since, these ayurvedic herbal preparations are known to work following holistic approach based on the concept of totality, henceforth, these serve as the innocuous and better futuristic drugs of choice for human beings across the world in the entire human ailments. These therapeutically relevant products of Nature are like the bliss for human health.

Better hopes for corona free life with natural remedies

Having hope for a life free from the corona virus is possible by following the natural measures. Herbal medicine has shown potential effects in managing different aspects of the COVID-19. For emergency purposes, remdesivir is an antiviral drug approved by WHO. Herbal medicine and its bioactive components can play a role in preventing COVID-19 and providing additional support. Various herbal remedies can help by hindering SARS-CoV-2 replication and entry to the host cells, potentially aiding in managing COVID-19 symptoms like fever and cough through their anti-inflammatory properties. Herbal preparations like *Gymnanthemum, amygdalinum, Azadirachta indica, Nigella sativa and Eurycoma longifolia* can be beneficial in COVID-19. Additionally, herbs such as *G. glabra, Thymus vulgaris, Allium sativum, Althea officinalis* and ginseng may help in facilitating the immune system, thus supporting in the prevention and clinical management of COVID-19.

CONCLUSION

The famine of COVID-19 defied the survival of human beings on earth mainly during the two dreaded waves, popularly known as the death waves of corona, *i.e*. 2020 and 2021. This disease compelled the human beings to go below the knee and survival was tough to realize. Over several million deaths occurred globally with a note on surpassing far more the number of infected people with this virus. Several drugs, therapies and preventive measures were practised to control the wide spread of infection and disease but the success rate was like a drop in the ocean. These circumstantial facts and figures forced us to review the entire situation of corona disease including its history, aetio-pathology, signs and symptoms, several ways of treatments and inherent complications, death statistics etc. Additionally, we have

extensively reviewed the literature related to the use of ayurvedic herbal preparations and their therapeutic potentials in cases of human corona virus disease. The essence of present research communication can be smelled in a manner that natural way of treatment, mainly the ayurvedic way of clinical management, appears quite logical, successful and peaceful.

A WORD OF GRATITUDE

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