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ABSTRACT:

Coronavirus which is a recently discovered virus which causes thousands of deaths and also results in tremendous impact on economy, education and physical as well as mental health. It is now named as SARS-CoV-2 by the International Committee on Taxonomy of Viruses. In this review an attempt has been made to; go in detail about causes, symptoms, diagnosis, pathophysiology behind it and various allelopathic as well as ayurvedic remedies used to cure SARS-CoV-2. India has a long history from different literature to use plants for cure of different treatments. More knowledge about ayurvedic remedies is helpful for health as they are not having side effects.

INTRODUCTION:

COVID-19 is a pandemic disease belonging to the family *Coronaviridae*, genus *Beta-coronavirus*, subgenus *Sarbecovirus*. It affects different people in different ways, having most common symptoms like fever, dry cough, tiredness, ache, pain, sore throat, diarrhea, and loss of taste or smell, a rash on skin, or discoloration of

finger or toes. Its outbreak came to light on December 31, 2019. The virus has been named as SARS-CoV-2 and disease has been called as COVID-19 and was first recognized in Bats. Coronavirus have crown like projections on their surface and the Latin word for crown is 'Coronam' [1]

Corona virus (CoV) is a large family of viruses that causes illness ranging from common cold to severe diseases most of the time upper respiratory bacterial illness. International Committee of Taxonomy Virus (ICTV) announced sever acute respiratory syndrome Corona Virus 2 (SARS-CoV-2). Hundreds of corona viruses exist in animals, but only seven of theses Corona viruses are known to cause illness in humans and they are separated into Alpha and Beta Corona viruses of 229E and NL63 are Alpha and OC43, HKUI, MERS-CoV, SARS-CoV, SARS-CoV-2 which causes Corona virus disease-2019. The name was chosen because the virus is genetically related to the corona virus responsible for SARS outbreak of 2 or 3. SARS-CoV-2 the virus that causes COVID-19 is a part of a group of viruses known as Corona viruses. COVID- 19 is elaborated like CO for Corona, VI for Virus, D for

Disease, 19 stands for 2019 [2].

PATHOPHYSIOLOGY OF THE DISEASE:

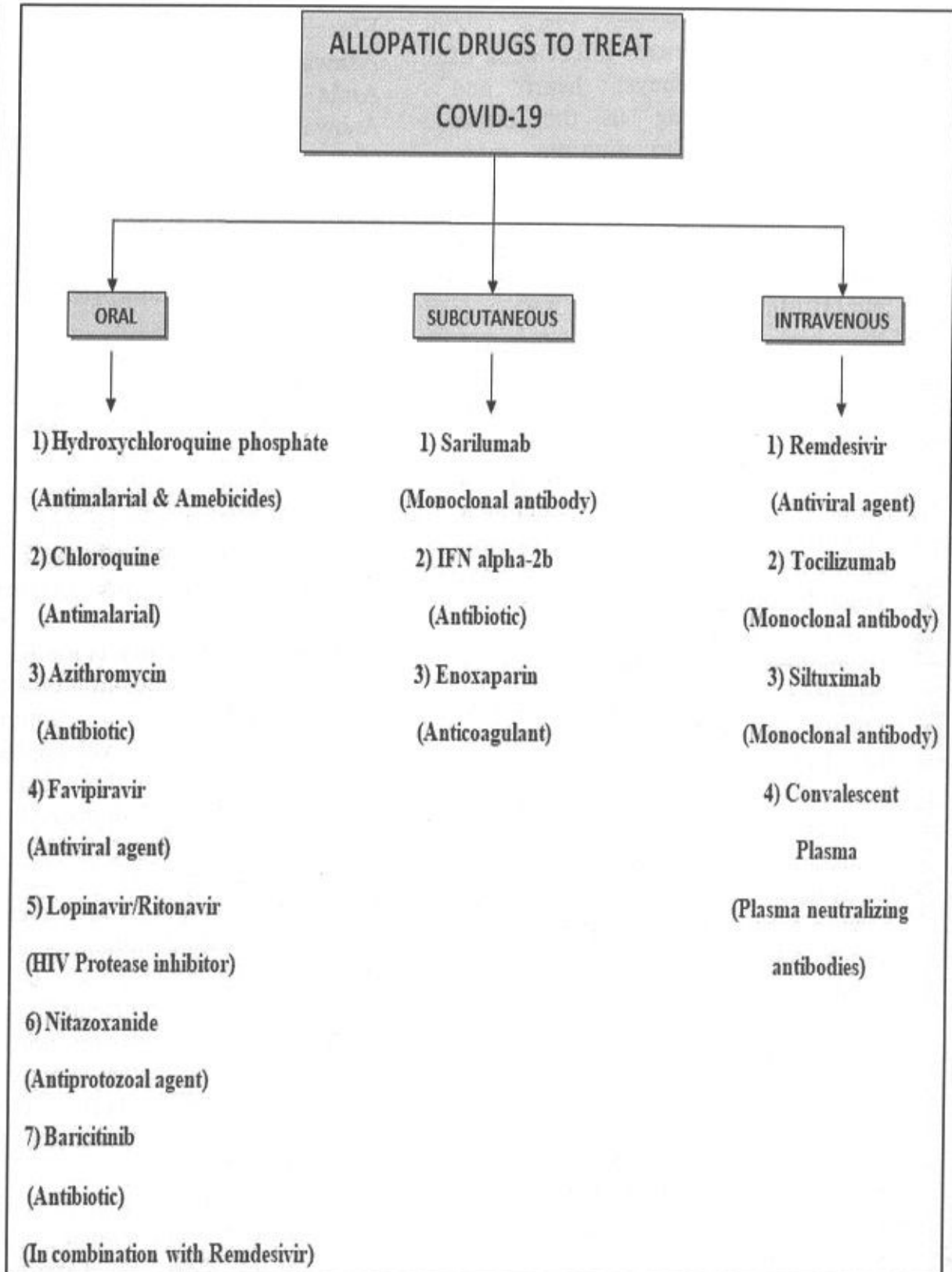
Coronavirus (SARS-CoV 2) is the third coronavirus that has brought a high mortality rate to the entire world facing this academic problem for the past 2 decades. SARS is the first coronavirus originated in Foshan, China in the 2002-2003 that cause severe disease acute respiratory syndrome (SARS) SARS- CoV pandemic [3] and the second coronavirus was originated from Arabian peninsula in 2012, that cause Middle East respiratory Syndrome (MERS). The most common Human Coronavirus is caused by the cold symptoms that are 229E and NL63, HKU1 and OC43 and is with largely developed single stranded RNA viruses of ~30kb. They are based on their genomic structure and largely divided into four genes alpha, beta, gamma, and delta. The alpha Coronavirus belongs to human Coronavirus and beta Coronavirus are classified in both SARS -CoV and MERS- CoV[4].

In the human body Coronavirus (SARS-CoV 2) is inhaled to ciliated secretory cells through respiratory droplets, contact with face etc. The majority of patients do not progress beyond this phase as the mounted immune responses in sufficient to contain the spread infection [5]. Primary viral replication is occur in nasal cavity and pharynx (mucosal epithelium of upper respiratory tract) also in gastrointestinal mucosa and lower respiratory tract.

Non-respiratory symptoms such as kidney failure, heart injury, diarrhea have been exhibited in some patients. ACE-2 expressed broadly in some multiple organs like nasal mucosa, kidney, lung, oesophagus, stomach, bronchus, ileum and bladder this human organ is vulnerable of SARS-CoV 2 [6]. In nasal epithelial the main host receptor for viral to enter into cells is ACE-2. This is highly expressed and seen in adult epithelial. The upper respiratory tract concluding upper airways, disease manifest symptoms of fever, dry cough and malaise. Due to this there is greater immune response during this phase involving the release of C-X-C motif chemokine ligand 10 (CXCL-10) and interferons (IFN-beta and IFN-lambda) from virus infected cells. In addition gender may also affect ACE-2 expression. ACE-2 expression Gene is located on X chromosome ACE-2 circulating level in men higher than women. This part may be responsible to differentiate in mortality and severity between men and women both in adult and pediatric population [4].

ALLOPATHIC REMEDIES:

Different allopathic formulations are currently tried and many are emerging, which are undergoing clinical trials for COVID-19 infections. A flow chart of drugs used for treatment of Covid -19 infection is summarized below from research communications [7, 8, 9].



AYURVEDIC REMEDIES

The Covid 19 viruses infect cells of the lungs, kidneys, heart and intestine, resulting in the organ damage leading to multiple organ dysfunction syndromes. India predominantly relied on plant-based medications under different domain names like Ayurveda, Siddha, Unani, etc [10]. In the absence of a Vaccine, the best option is to improve immunity against COVID-19. By various means like health supplements, medicine, healthy Nutritious food, and active lifestyle is suggested [11]. The combined initiative is being taken by the Ministries of AYUSH (Ayurveda, Yoga, Unani, Siddha, Homeopathy in India), Health, Science and Technology through the Council of Scientific and Industrial Research (CSIR) with technical support from the Indian Council of Medical Research (ICMR) of working together to test four Ayurvedic formulations commonly known as Rasayanas of Ashwagandha, Yashtimadhu, Guduchi, Peepli and Ayush 64 [12]. The ministry of Ayush recommended 'AYUSHKWATH' formulation to help boost the immune system and as the body's first line of defense against bacteria and Viruses. It is combination of four Medicinal herbs commonly used in every Indian Kitchen – *Ocimum sanctum* (tulsi), *Cinnamomum verum* (dalchini), *Zingiber officinale* (sunthi), and *Piper Nigrum* (krishnamarich). Clinical trials on Ayush-64 along with few other drugs are also proposed to combat covid-19 as it

can be seen effective in influenza like illness. Tulsi (*Ocimum sanctum*), Ashwagandha (*Withania somnifera*), Amla (*Emblica officinalis*), Ashwattha (*Ficus religiosa*), Brahmi (*Bacopa monnieri*), Dhanyak (*Coriandru msativum*), Rason (*Allium sativum*), Guduchi (*Tinospora cordifolia*), Haridra (*Curcuma longa*), Yashtimadhu (*Glycyrrhiza glabra*), Kantakari (*Solanum xanthocarpum*), Marich (*Piper nigrum*), Nimba (*Azadirachta indica*), Pippali (*Piper longum*), Sunthi (*Zingiber officinale*), Twak (*Cinnamomum zeylanica*), Vasa (*Adhatoda vasika*) are recommended by Ayurveda for ailments like COVID -19 which are originated from Vata & Kapha. All the drugs obtained from these plants are having antioxidants, anti-inflammatory, immunomodulatory, antiviral, antimicrobial and vata-kapha activities. Along with these churnas like Taleesadi, Sitopaladi proved very useful against cough, cold and breathing problems [13].

Major aim of Ayurveda is to prevent disease by boosting immunity. Such herbal remedies included the use of natural plants, nutrients, and vegetables [14]. Following are the key clinically tested antiviral ayurvedic medicinal herbs which may be beneficial for the treatment of COVID 19 (Table 1).

From ancient times herbal remedies have proved beneficial and inculcation of these for Covid 19 infection will come true the paradigm shift of ayu to dirghayu, dirghayu to sukhayu and sukhayu to hitayu for human welfare [21].

Sr. No.	Name of plant	Chemical Content	Use
1	<i>Glycyrrhiza glabra</i>	Anethole, polysaccharides like glycyrrhizin, Saponins, Triterpine, and Glycyrrhizic acid	Potential ability to inhibit respiratory virus [15, 16].
2	<i>Ocimum sanctum</i>	B-caryophyllene, Rosmarinic acid, ursolic acid, Linalool, Eugenol, Carvacrol and Oleanolic acid. Eugenol	Antibacterial, antifungal and Antiviral activity [17].
3	<i>Allium sativum</i>	Rich source of flavanols like Isorhamnetin, Kaempferol, Myricetin, and Quercetin, Flavonoids.	Strong inhibitory effect on virus multiplication and also blocks the synthesis of proteins and Genetic material in the virus [18].
4	<i>Cocos nucifera</i>	Medium-chain Fatty acids (MCFA), and their derivatives like monoglycerides of oil	Antiviral properties [19].
5	<i>Camellia sinensis</i>	Catechins, polyphenolics.	Vigorously block binding of the viruses on red blood cells which help to build strong immunity [20].

CONCLUSION:-

Corona disease is caused due to Betacoronavirus infection through coughing, sneezing and exhaling droplets of an infectious person. Common symptoms lead to difficulty in breathing, dip in oxygen saturation and finally severe respiratory damage. Boosting immunity is helpful to overcome this disease is of primary importance. Several ayurvedic remedies like to use medicinal herbs as they are rich in antioxidants shown to be effective for prevention and treatment of SARS-Co-V-2. Covid 19 situation proved that health is an individual responsibility that can be maintained by proper treatment to cure disease, diet and exercise for the restoration of health.

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