

COVID-19 PANDEMIC, UNANI MEDICINE AND IMMUNOMODULATION

Fatima Azmi^{1*} and Humaira Bano²

¹Deanship of Educational Services, Department of General Sciences. Prince Sultan University. Riyadh 11586, Saudi Arabia.

²Regional Research Institute of Unani Medicine. Ministry of AYUSH (CCRUM). Government of India. Mumbai, India.

Article Received on
03 August 2020,
Revised on 23 August 2020,
Accepted on 13 Sept. 2020,
DOI: 10.20959/wjpr202011-18763

*Corresponding Author

Fatima Azmi

Deanship of Educational
Services, Department of
General Sciences. Prince
Sultan University. Riyadh
11586, Saudi Arabia.

ABSTRACT

COVID-19 is a life-threatening infectious disease and has no existing cure or treatment. Recent studies are trying to understand how the immune system is reacting to fight the coronavirus. Unani medicine has rich literature regarding infection's invasion over the body, the causes of disease, curative measures, and treatment for epidemics/pandemic diseases, such as; acute catarrh and influenza pandemic. Unani scholars prescribed many drug formulations for the prevention and treatment of infectious diseases. Most importantly, they recommend using *Tiryaaq Wabai* (antidote), to evacuate the lethal matter out of the body. A literature review revealed the scientific study done on polyherbal formulation antidote (*Tiryaaq Wabai*), presenting it

as an immunomodulator for the elderly. Based on the literature review, the treatment and formulations for influenza pandemic (*Nazla-Wabai/Nazla-Haar*) could be adopted for coronavirus patients having mild to moderate symptoms, as a supportive treatment. In the article we list a large number of herbs that possess immunomodulatory activity, and we end the article with a list of ingredients and methods of preparation of some Unani drug formulation, which are used during pandemic diseases. There is a high possibility of having another pandemic after COVID-19. Therefore, there is a need to develop new effective infection control methods accessible to people. From our review, we suggest that proactive researches on Unani medicine can generate reliable indication regarding their role in disease prevention and health advancement.

KEYWORDS: COVID-19 pandemic, Unani medicine, treatment, respiratory infection, medicinal herbs.

1. INTRODUCTION

In December 2019, a series of pneumonia cases of unknown cause emerged in Wuhan, China, with clinical presentations resembling viral pneumonia.^[1,2] In-depth sequencing analysis from lower respiratory tract samples indicated a novel coronavirus, due to implication in the respiratory system, it was called severe acute respiratory syndrome coronavirus 2, then later as COVID-19. The World Health Organization (WHO) declared COVID-19 as a six public-health emergency of international concern.^[3] Today, the whole world faces severe health disaster of the COVID-19 pandemic disease; within three months, it was spread to almost 72 countries.^[4] It is considered the most critical health problem of this century. Throughout history, the world went through many plagues; in the 6th century, Justinian's plague struck and killed as many as 50 million people. Then in the 14th century, the Black Death plague killed up to 200 million people. Later in 1918, about 50 to 100 million people died of the influenza pandemic.

It has been observed that whenever there was a plague or pandemic, high stress was put on taking preventive measures to reduce the spread of the plague, then search for management and possible treatment. WHO advised the population to wash their hands as many times as possible to protect against COVID-19, distancing, wearing a mask, and issuing the preventive measure of isolation and quarantine to alleviate the spread of COVID-19. Most of these preventive measures' date back more than 1,400 years ago, at the time of the Prophet Mohammad, who advised the people during the outbreak of any infectious pandemic in a land, *"If you hear that there is a plague in a land, do not enter it; and if it (plague) visits a land while you are therein, do not go out of it"*.^[5] Furthermore, Prophet Mohammad always advised people to adopt good hygiene and stay clean all the time, and being clean is considered part of the Muslim faith.

Medieval Muslim physicians, such as Razi, Majusi, Ibn Sina, Tabri, Ibn Hubal, Jurjani, Samarqandi, and Arzani, made significant contributions in medicine, particularly in epidemiological research. They developed formulations using natural origin, either from plants or minerals, to cure the disease. Their extensive literature regarding the epidemic/pandemic diseases produced into the body by way of infection is self-explanatory about their vast knowledge regarding infectious diseases and how they invade and cause

illness. The clinical features of the epidemic/pandemic, its complications, remedies, and curative treatment are written in a very detailed and comprehensive manner.

The medieval Islamic medicine, is presently known as Unani Medicine (Unani is an Arabic word for Greek), and it continues to be practiced to this day in India, Pakistan, and Bangladesh^[6], that is why almost all of the medical and technical terminologies used in Unani medicine are in Arabic words but written in the Urdu language. In the Arabian medicine book, Browne^[7] wrote, “Arabic is on the whole well adapted for providing a suitable technical terminology, which in fact it has done for the whole Muslim world.” In our subsequent discussion, we will refer to medieval Islamic medicine as Unani medicine.

2. METHODOLOGY

The authors searched major scientific databases namely, Pubmed, Science Direct, MEDLINE, for most recent information regarding COVID-19 pandemic, symptoms, transmission, preventive measures, treatment, Unani formulations, immunomodulators, also for herbs with immunomodulatory potential, which are used in Unani medicine. The authors relied heavily on the Unani medicine books, which are available in print (Urdu language), for information related to epidemic/pandemic diseases; such as “*Kamil-us-Sana al-ṭibbiya*”, by Majusi, who is also known as Haly Abbas (930-994 CE), and three books “*Kitab-Al-Mansoori*”, “*Kitab-al-Murshid*” and “*Kitab-al-Hawi Fi-Tib*,” by Razi, who is also known as Rhazes (852-932 CE). Ibn Sina, who is known as Avicenna (980-1037 CE), his work *Al-Qanun fi -Tib* (The Canon of Medicine). Furthermore, the book “*Zakherah Khawarizm Shahi*,” by Jurjani (1040–1137 CE). Then the book “*Kitab-al-Mukhtarat Fi-tib*,” by Ibn Hubal Baghdadi (1122-1213 CE), also “*Kulliyat*” by Ibn Rushed (1126-1198 CE). Moreover, the book “*Haziq*,” by Ajmal Khan (1868 - 1927 CE), and “*Biyaz-e-Kabeer*” by Kabirudin (1889-1976 CE), many more books and articles were consulted. The original digital manuscripts can be accessed through the world digital library-library of Congress. Mostly they are in Arabic language, few in Persian.

3. Epidemic/Pandemic in Unani Literature

3.1 Therapeutic strategies in Unani medicine

The Unani pharmacology was the strongest empirically based biological science. It was built on Galen's humoral theory, which considers the disease a natural process and symptoms as a reaction of the body to pathological factors. In Unani medicine, apart from treating disease conditions, it lays great emphasis on the prevention of diseases and the promotion of existing

health, searching to cure the disease's cause. High stress is laid on the maintenance of a proper environmental balance, keeping the air clean and free from pathogens, similarly water and food free from pollution, especially in case of infectious diseases. Ibn Sina, in *Al-Qanun fi Tib* (The Canon of Medicine), stated, "The origin of the epidemic is not known".^[8] However, he gave clear thought on causes of the epidemic, such as seasonal changes and imposed geographical variation, which is one of the most critical causes, such as sudden sunny weather or sudden rainfall in winter and drought in the rainy season.^[8] The compositional change of air from the bodies crop up, causing epidemics like smallpox and measles, which travel through the air.^[8-11] The imbalance of bodily fluid is also an essential factor of epidemics due to extra humours in the body, as a result of lifestyle, lasting illness, regular diet, or weak immune system.^[8-11] Thus, it is the body's ultimate power that tunes the body to stay in a healthy condition. Immunity (Quwat-e-Mudafe'at) is a defense system within the body to protect the host from invading pathogens. One of the therapeutic strategies in Unani medicine is to increase the body's natural resistance and help in self-preservation (Quwaate-e-Mudabbera) to restore normal health, rather than directly neutralizing the agent itself.

3.2 Epidemic/pandemic diseases and their clinical features in Unani literature

Majusi, in his book, *Kamil-us-Sana al-tibbiya*, made a significant and comprehensive contribution regarding etymology and the definition of epidemic/pandemic disease.^[10] Razi, in his treatise concerning contagious diseases, "*Kitab-Al-Mansoori*," was among the first who used the humoral theory to distinguish one contagious disease from another, establishing knowledge of differential diagnosis in medical science and providing a clinical characterization of the disease.^[11,12] Ibn Sina was the first medieval Muslim physician who explained evidently about infection and reservoirs of infection in terms of climate changes, in his work "*Al-Qanun fi al-Tibb*," he characterized the types of temperaments and types of people who are more vulnerable to infection.^[8] Ibn Sina, Majusi, Samarqandi, Ajam-Khan, Azam-Khan, and Kabirudin, gave a clear description of the clinical features of pandemics.^[8-10, 13-15] Samarqandi, mentioned about the infectious diseases, *Influenza Pandemic (Nazla-Wabai/Nazla-Haar)* in his book "*Al-asbab-wa-Alamat*"^[9], it erupts in a large population.^[9,16] Hakim Ajmal described the influenza pandemic "Its outbreak is like plague, cholera and other epidemic diseases with high death rates."^[13] The clinical features of the influenza pandemic (Table 3) were presented in detail by Samarqandi, kabirudin, and Ajaml-Khan.^[9,13,14] Jurjani, in his book "*The treasure of Khwarazm shah*," stated that patients should not lay down on

their backs; they should lay down on their chest with face down facing the pillow in a slightly inclined position to prevent secretion running down to their lungs and causing pneumonia.^[17] A recent study proved that patients hospitalized with coronavirus disease and on ventilators, lying face down, were better for their lungs.^[18]

3.3 Therapeutic treatment for epidemic/pandemic disease in Unani Medicine

Living a healthy lifestyle, social distancing, sanitization, and freshening the surrounding air and freeing it from contamination, is advised. Fumigating with camphor (essential oil), using herbs like *oud* (eaglewood), *kundur* (*Boswellia serrata* Roxb.), *mur* (resin of myrrh tree), and *qust* (Indian costus) is desirable.^[8-10,19] Avoid red meat and concentrate on eating citrus fruits, such as pomelo, pomegranate, oranges, grapes, guava, etc., and drinking citrus juices. Monitoring general health regularly and eliminating the waste from the body, either by venesection or cupping is also recommended.^[19] Purgation using some laxatives^[8,10], and evacuation^[20], is advised. Body strengthening and rebalancing and restoration of temperament may provide curative measures.^[8,10,19] Monitoring the strength of the vital organs and, most importantly, evacuating the lethal matter out of the body using *Tiryag Wabai* (antidote) and other formulations.

4. RESULTS

4.1 Unani medicine and Immunomodulators

Modulation of the immune system denotes any change in the immune response that can involve induction, expression, amplification, or inhabitation of any phase of the immune response. Thus, an immunomodulator is a substance used for its effect on the immune system.

They are either biological or synthetic substances that can stimulate, suppress, or modulate any aspect of the immune system, including innate and adaptive immune systems. There are two types of immunomodulators: immunosuppressants and immunostimulators.^[21]

Recent studies are trying to understand how the immune system fights the coronavirus. Measuring immunity to coronavirus is the key to understanding COVID-19 and vaccine development.^[22-24] Another study raised concerns that people could be infected repeatedly or the vaccine might not provide long term protection, and that infected people with coronavirus have a lower immune system.^[25] One of the therapeutic strategies in Unani medicine, as Razi mentioned in "*Kitab-al-Murshid*"^[20], is to increase the body's natural resistance to the disease

and pathogen and help in self-preservation *Quwaate-e-Mudabbera* (Vis medicatrix naturae) to restore the natural health, rather than directly neutralizing the agent itself.

Once a pathogen successfully entered the body, they are addressed, first by the innate immune system, then by the adaptive immune system. In order to accelerate, eliminating the infections or the disease from the body, use of drugs, and formulations are required. Herbal drugs are known to possess immunomodulatory properties and generally act by stimulating specific and nonspecific immunity.^[26] In Unani literature, many herbs endorse physical and mental health and are claimed to possess immunomodulatory activity. Table 1 represents herbs with immunomodulatory potential, which are used in Unani medicine.^[27]

Table 1: herbs with immunomodulatory potential used in Unani medicine.

No.	Botanical Name	Unani Name	Part Used	No.	Botanical Name	Unani Name	Part Used
1	<i>Withania somnifera</i> L.	Asgand	Root	13	<i>Piper longum</i> L.	Filfil daraz	Fruits and Leaves
2	<i>Aloe Vira</i>	Elwa	Leaves	14	<i>Terminalia Chebula</i> Retz	Halela	Fruits
3	<i>Rubica cordifolia</i> L.	Fowah	Leaves	15	<i>Carica papaya</i> L.	Papita	Leaves and Seeds
4	<i>Nigella sativa</i>	Kalonji	Seeds	16	<i>Emblica officinalis</i> L.	Amla	Fruit
5	<i>Hibiscus rosa sinensis</i> L.	Gudhal	Flower	17	<i>Tinospora Cordifolia</i> L.	Gilo	Stem and Root
6	<i>Curcuma longa</i>	Haldi	Rhizome	18	<i>Plantago major</i> L.	Bartang	Seeds
7	<i>Azadirachta indica</i>	Neem	Flower, Leaves, Seeds	19	<i>Matricaria chamomilla</i>	Baboona	Flowers
8	<i>Ficu benghalensis</i> L.	Bargad	Whole PLant	20	<i>Mangifera indica</i> L.	Aam	Fruits
9	<i>Chlorophytum borivilianum</i>	Musli Safed	Root	21	<i>Ocimum sanctum</i>	Rehan	Leaf
10	<i>Asparagus recemosus</i> wild	Satavar	Root	22	<i>Zingiber officinate</i>	Zanjabeel	Rhizome
11	<i>Nelumbo nucifera</i>	Neelofer	Rhizome seeds	23	<i>Acacia catechu</i>	Kath	Bark
12	<i>Glycyrrhiza glabra</i> L.	Aslussus	Bark and Root	24	<i>Cinnamomum Zeylanicum</i>	Darchini	Bark
				25	<i>Terminalia belerica</i>	Balela	Fruit

4.2 Unani Formulation for pandemic diseases

Unani scholars prescribed many single drugs and compound formulations for the prevention and treatment of infectious diseases. Some drugs improve the immunity of the person, such drugs are recommended during epidemics/pandemics, and it can be used as immune bootstring/ symptomatic relief in upper respiratory tract infections. Strengthening the vital organs is essential, but evacuating the lethal matter out of the body by using *Tiryaaq Wabai* (antidote) and other formulations, as shown in Table 2, is essential.^[8,10,19] The doses of the drugs vary according to the patient's medical condition, age, and symptoms.

Table 2 represents three recommended single and compound drug formulation classes for epidemic/pandemic diseases. The classes should not be taken together, and diabetic people need to take extra care, as not all drugs are recommended for them.

Table 2: Recommended drug formulations for epidemic/pandemic diseases.

	Botanical Name	Unani Name	Preparation		Dosage	Effective against
Class A	(Antidote) Aloe Barbadensis Gum of myrrh tree <i>Saffron</i> ^[8,10,11,13-15,19]	<i>Tiryaaq Wabai</i> Elwa <i>Mur-makki</i> <i>Saffron</i>	2 parts 1 part 2 parts	Mix all together	3.5 gm 1-2 times week	strengthen the vital organs, cardio-tonic, evacuate the lethal effect of the disease
	Cydonia oblonga ^[19] Zizyphus Jujuba ^[9] Cordia myxa ^[8]	Behi dana Unnab Sapistan	3 gm 5 no. 9 no.	Boil all together in 250ml water	Decoction twice day for 14 days	Antioxidant Immunomodulatory Muscle relaxant Anti-influenza
Single and compound formulations						
Class C	Shrabat Unnab ^[28] Sharbat Khaksi ^[29] Sherbat Zofa Murrakab ^[30]		20 ml 20 ml 20 ml	Taken with warm water	every 4 hours	Effective in prevention of respirator stress, chest congestion and breathlessness
	Khamira Gaozaban ^[30] Arqe Gaozaban ^[30]		6 gm 30 ml	Taken orally	Twice a day	Heart tonic, brain tonic, memory enhance, vision improver
	Qairooti Arde Karsna ^[30]		20 gm Apply on chest, lukewarm, cover by cotton		3 times a day.	It is beneficial in chest pain, breathlessness, tightness in the chest, pneumonia pleurisy.

4.3 Influenza pandemic (*Nazla-Wabai/Nazla-Haar*) and COVID-19 pandemic

COVID-19 is a pandemic, with no possible cure or treatment until today, despite the significant research. Furthermore, globally people are still getting affected, and amazingly different people have different symptoms. Some people may have only a few symptoms,

while others are asymptotic. People with existing medical conditions, such as diabetes, lung disease, heart disease, or weak immune systems, or elderly may be at higher risk of infection, which is similar to influenza. Although the recovery time is 14 days, some people might take longer to recover. The symptoms and clinical features of COVID-19 can range from very mild to severe and are represented in Table 3, together with the symptoms of influenzas pandemic (*Nazla-Wabai/Nazla-Haar*) and its complications, for easy comparisons.

Table 3: Clinical presentation of epidemic stricken complication, influenza pandemic/pandemic fever, and co-existing COVID-19 pandemic.

Epidemic/Pandemic diseases	Clinical features and symptoms of
influenza pandemic (<i>Nazla-Wabai/Nazla-Haar</i>)	severe nasal discharge, severe pain in the throat, husky voice, severe dry cough, headache, and backache followed by fever ^[31] , mild to high fever, irritation, and burning in the throat ^[8] , Fever with possible chills and rigors, pain in eyes and body, Loose motion, Fatigue. ^[14] Chest pain/ congestion and tightness in the chest, shortness of breath, Pneumonic lungs, heaviness in the chest, Choking Throat, Pneumonia, and pleurisy. ^[14,31] Severe inflamed condition of the larynx and pharynx progressively reach down to the lung and resulting in pneumonia. ^[10] Nausea/vomiting, Debilitation of general health. If mild infection, patients recover within a week. ^[13,14,32]
Severe common complications of pandemic diseases	Cold extremities, Dry tongue, bad mouth taste, heat in the chest, Pain (everywhere), Loss of strength and appetite, Heat sensation in the heart, Massive infiltration (inflammation) in weak organs ^[8,10,19] , Mental confusion, Profuse sweating, Dragging pain in the edge of lower ribs, Bilious vomiting ^[8,10,11,19] , throat and trachea severely affected ^[8] , Excessive thirst ^[8,10,33] , Bilious diarrhea, Turbid urine or blood clots in urine, black/yellow colored urine ^[10,11] , Loose joints ^[33] , Tachypnea ^[11] , General body condition is very poor ^[8,10,11] , Weakened cartilaginous structure. ^[10] Loss of energy (maybe ruptured red blood cells), the blood becomes diffusible. ^[8,10]
COVID-19 pandemic disease	Altered mental status, Sore Throat, Fever, Dry cough, Loss of taste and/or smell, Nasal congestion, Malaise, Headache, muscle pain, Tachycardia, Diarrhea and vomiting, Involvement of upper respiratory tract, cough and shortness of breath, Acute progressive renal injury, renal impairment with reduced urine output, Cyanosis in children, Tachypnea in children Fever associated with severe dyspnea, Respiratory distress, Hypoxia (SpO ₂ < 90% in room air). Functional alterations of organs, multi-organ damage, Coagulopathy. ^[34,35]

5. DISCUSSION

Recent studies are trying to understand our complicated immune system, how it reacts to fight the respiratory coronavirus, and how the immune system responds to this pathogen. Measuring immunity to coronavirus is the key to understanding COVID-19 and vaccine development.^[22-24]

Once the pathogens have successfully entered the body, they are addressed, first by the innate immune system, then by the adaptive immune system. Both systems consist of a multitude of cells and molecules that interact in a sophisticated manner to detect and eliminate the pathogens.

A study carried in China^[25], showed that many COVID-19 patients lose a substantial level of their coronavirus-neutralizing antibodies after few months, which raised concern that people could be infected repeatedly or even the vaccine might not provide long term protection. It also demonstrated that people infected with COVID-19 had a lower immune system.^[22-25]

A scientific study concerning the evaluation of polyherbal formulation *Tiryaq Wabai* (antidote), as an immunostimulatory in the elderly^[36], indicated that elderly are prone and at an increased risk of infection and related complications, due to their weak immune system. *Tiryaq Wabai* (antidote) was used to prevent epidemic disease during outbreaks, but it was not being explored scientifically. Their study was carried out on 30 people, 20 were in the test group, and 10 in the control group. *Tiryaq Wabai* was given to the test group 500 mg three times a week for 45 days; also placebo was given orally to the control group at a dose of 500 mg, three times a week for 45 days. The drug showed statistically significant increase in TLC ($p < 0.001$).^[36] Hence, the study presented the immune-stimulating activity of *Tiryaq Wabai* and supported its use in conditions where immunostimulant is required. Furthermore, supporting the claim made by Physicians, such as Majusi, Razi, Ibn Sina, Jurjani, Ibn Hubal, Ibn Zuhr, Ibn Nafis, Ajmal Khan, and Kabirudin, that the antidote (*Tiryaq Wabai*) is one of the most useful formulations during the epidemic (Table 2), as a preventive treatment when administered once or twice a week.^[8,14,17,28,30,37] Many other formulations are mentioned in Table 2. However, there is a need for more scientific studies and proactive researches on Unani medicine, which can provide evidence of their role in disease prevention and health improvement.

The comparison, between the symptoms and clinical features of COVID-19 patients with symptoms and clinical features of the influenza pandemic (*Nazla Wabai/ Nazal-Haar*) patients and their complications showed similarities (Table 3). Therefore, based on the literature review, those formulations could be adopted to COVID-19 patients having mild to moderate symptoms, as a supportive treatment.

Table 4 shows the ingredients and preparation method for some formulations, which are used as a treatment for epidemic/pandemic diseases, according to the patient's symptoms.

Table 4: Ingredients and methods of preparation of some Unani formulations.

Formulation's name	Ingredients and its quantity	Preparation	Dosage	Its uses
<p>Laoq Khayarshamber^[38]</p> <p>Its name is due to its ingredient Khayarshamber (<i>Cassia fistula pulp</i>)</p>	<p>Chief Ingredient: Khayarshamber (<i>Cassia fistula pulp</i>)</p> <p>Ingredients: Unnab (<i>Zizyphus sativa fruit</i>) 15 No. Sapistan (<i>Cordia dichotama, C. latifolia fruit</i>) 15 No. Banafshah (<i>Viola odorata flower</i>) 9 gm Khatmi (<i>Althea officinalis seed</i>) 5 gm Senna (<i>Cassia senna leaf</i>) 15 gm Water 750 ml Khayarshamber (<i>Cassia fistula pulp</i>) 45gm Sheerkhisht (<i>Fraxinus ornus exudate</i>) 15gm Khameera Banafshah 30gm Turanjabeen (<i>Tamarix indica gum</i>) 60gm Sugar 250gm Roghan Badam Sheereen (<i>Prunus amygdalus oil</i>) 5 ml</p>	<p>Soak Unnab (<i>Zizyphus sativa fruit</i>), Sapistan (<i>Cordia dichotama, C. latifolia fruit</i>), Banafshah (<i>Viola odorata</i>), Khatmi (<i>Althea officinalis seed</i>) and Senna (<i>Cassia senna leaf</i>) in water at night.</p> <p>In the morning boil till it remains half. Mesh it well and filter it. Mix Khayarshamber (<i>Cassia fistula pulp</i>), Sheerkhisht (<i>Fraxinus ornus exudate</i>), Khameera Banafshah, Turanjabeen (<i>Tamarix indica gum</i>) and filter again. Mix Sugar and keep it on low heat. Make basic Solution of Particular consistency and mix Roghan Badam Sheereen (<i>Prunus amygdalus oil</i>).</p>	10-20gm	It is beneficial in Sore Throat, Cough, Pleurisy and Asthma. It is also used as Laxative.
<p>Khameera Khashkhash^[38]</p> <p>Its name is due to its ingredient Khashkhash (<i>Papaver</i></p>	<p>Chief ingredient: Khashkhash (<i>Papaver somniferum capsule</i>)</p> <p>Ingredients: Koknar Musallam (<i>Papaver somniferum capsule with seed</i>) 100 No. Distilled water 2 1/2 liter</p>	<p>Preparation: Crush the Koknar (<i>Papaver somniferum capsule</i>) and take out the seed. Make powder of seed. Boil Post Koknar (<i>Papaver</i></p>	5-10gm with Arq Gaozaban 125 ml.	It is beneficial in Catarrh, Coryza, Cough, Tuberculosis, Phlegmatic Cough.

<i>somniferum capsule</i>). Its life is two years	Sugar 1 1/2 kg	<i>somniferum capsule</i>) and seed in water. Filter it and add Sugar and prepare for the basic solution of particular consistency. Triturate it till it becomes white.		Also used in Menorrhagia.
Sharbat Zoofa ^[14]	Anjeer(<i>Ficus carica</i>)10 No. Khatmi (<i>Althea officinalis seed</i>)10.5gm, Aslus soos(<i>Glycyrrhiza glabra</i>)10.5 gm, Irsa(<i>Iris ensata</i> Thunb.)10.5gm, Badiyan (<i>Foeniculum vulgare</i> Mill.) 18gm, karafs(<i>Apium graveolens</i> Linn.) 18gm, parsioshan(<i>Adiantum capillus-veneris</i> Linn.) 21gm, Zufa (<i>Hyssopus officinalis</i> Linn.) 24 gm, Munaqqa (<i>Vitis Vinifera</i>)108gm Sugar 1 kg, Gulqand (conserve rose petals in honey) 500gm	Soak all medicine in the water for 24 hours then boil it until it remains half. Mesh it well and filter. Then add Sugar and meshed Gulqand, then prepare a basic solution of particular consistency.	24 ml with lukewarm water twice a day	It is useful in productive cough, chest congestion, and Breathlessness
Qairuti Ard karsana ^[14,38]	Karsana(<i>Pisumsativum</i> ,flour) 60gm, Hulba (<i>Trigonella foenum-graecum</i> flour) 60gm, shuneez(<i>Nigella sativa</i>)24gm, Aslussoos(<i>Glycyrrhiza glabra</i>)24gm, Aqarqarha(<i>Anacyclus pyrethrum</i>)18gm, wax 72gm and sausan oil (<i>Rudbeckia hirta</i>)	Melt the wax into the oil, all other medicine grinds into a fine powder and mix well and make a paste apply over the chest.		This paste is beneficial in chest pain, breathlessness tightness in chest pneumonia pleurisy.

6. CONCLUSION

This century's most significant problem is considered COVID-19 pandemic. Although the fatality rate of COVID-19 is considerably less compared to the fatality rate of previous plagues and pandemics that the world has faced, the fear of pandemic is more significant than before, since it is more contagious than others. Finding a cure for this disease is a big challenge for researchers and doctors.

Unani Physicians knew about infection's invasion and the causes of the disease. Collectively they all agreed regarding the occurrence of epidemic/pandemic illness. Their rich literature is a witness for their comprehensive knowledge of the morbidity and mortality of each of the epidemics, clinical features, preventive measures, and curative treatment. They presented that the human body's characteristics and temperament played a significant role in making people become sick with infectious diseases due to a weak immune system and weakened innate power to protect them. In order to accelerate, eliminating the infections or the disease from the body, use of drugs, and formulations are required. Majusi, Razi, Ibn Sina, Jurjani, Ibn Hubal, Ibn Zuhr, Ibn Nafis, Ajmal Khan, and Kabirudin, agreed on the use of an immunomodulator polyherbal formulation, *Tiryaaq Wabai* (antidote), during influenza pandemic (*Nazla-Wabai/Nazla-Haar*). Other formulations are also recommended (Table 2). Thus, based on the literature review, those formulations could be adopted to COVID-19 patients having mild to moderate symptoms as a supportive treatment.

There is a high possibility of having another pandemic after COVID-19. Thus, we need to educate the people about adopting preventive measures, social distancing, sanitization, etc. as a precautionary measure and increase the body's immune power, especially in the elderly and those who suffer from some illness. Furthermore, there is a need to develop new effective infection control methods accessible to people. Moreover, from our review, we suggest that proactive researches on Unani medicine can produce reliable suggestion regarding their role in disease prevention and health improvement.

Competing interest statement

The authors declare no conflict of interest.

Acknowledgment

The first author would like to thank the Deanship of Educational Services at Prince Sultan University for funding this project.

Funding

This work was supported by the research project: Prevention and Management of Pandemic Diseases by Medieval Islamic Medicine (Unani System of Medicine) and its Perspectives for COVID-19 Pandemic, Prince Sultan University, Saudi Arabia [Grant number COVID-19-DES-2020-43].

REFERENCES

1. WHO, Novel coronavirus-China, Jan12, 2020. <http://www.who.int/csr/don/12-january-2020-novel-coronavirus-china/en/>.
2. C. Huang, Y. Wang, L. Li X, Ren, J. Zhao J, Y. Hu, et al., Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China., 2020; 395(10223): 497- 506. [https://doi.org/10.1016/S0140-6736\(20\)30183-5](https://doi.org/10.1016/S0140-6736(20)30183-5)
3. X. Li, W. Wang, X. Zhao, J. Zai, Q. Zhao, Y. Li, A. Chaillon, Transmission dynamics and evolutionary history of 2019-nCoV. *J Med Virol*, 2020; 92: 501–511. doi: 10.1002/jmv.25701.
4. M. Chinazzi, J.T. Davis, M. Ajelli, C. Gioannini, M. Litvinova, S. Merler, et al., The effect of travel restrictions on the spread of the 2019 novel coronavirus (COVID-19) outbreak. *Science*, 2020; 368(6489): 395-400. <https://doi.org/10.1126/science.aba9757>.
5. Sahih Al-Bukhari. Sahih Al-Bukhari, Dar-As-Salam, 1997.
6. H. F. Nagamia, Islamic Medicine History and Current Practice. *JISHM*, 2003; 2: 19-30. <https://www.ishim.net/ishimj/4/04.pdf>.
7. E.G. Browne, Arabian Medicine, Cambridge at the University Press, 1921; P36.
8. Ibn Sina. Al-Qanun Fi-Tib. Munshi Naval Kishore Lucknow. 1899. Urdu.
9. Samarqandi Najibuddin. Mualijat Sharah Asbab-O-Alamat. Darya Ganj New Delhi. 2009. Urdu.
10. Majusi A. Ibn Abbas. Kamil-us-Sana al-ṭibbiya. Naval Kishore Lucknow. 1889. Urdu.
11. Razi AZ. Kitab-al-Mansuri. CCRUM, Ministry of Health and Family Welfare Government of India, New Delhi, 1991: 175-176, 422. Urdu.
12. Razi AZ. Kitab-al- Hawi Fi-Tib. Dar Al-Kotob Al-ilamiyah, Beirut-Lebanon, 2000; 6: 10-15. Arabic.
13. Ajmal-Khan Hakim. Haziq. Urdu Bazar, Lahore, 1987: 52-53. Urdu.
14. Kabirudin Hakim Mohammad. Biyaz-e-Kabeer. Hikmat Book Depot Hyderabad Dakin, 1938; 2: 53,61, 81-85, 110, 123. Urdu.
15. Azam-khan Mohammad. Rumuz-e-Azam. CCRUM, Ministry of Health and Family Welfare, Government of India, 2005; 2: 308-309. Urdu
16. Ibn Rushd AW. Kulliyat. CCRUM Ministry of Health and Family Welfare Government of India, New Delhi, 1980: 163. Urdu.
17. Jurjani Mohammad Ismail. Tarjuma Zakheera-e-Khwarzam Shahi. Munshi Neel Kishore. Lucknow, 1889. Urdu.

18. C. Pan, L. Chen, C. Lu, W. Zhang, J.A. Xia, M.C. Sklar, et al., Lung Recruitability in COVID-19–associated Acute Respiratory Distress Syndrome: A Single-Center Observational Study, *American Journal of Respiratory and Critical Care Medicine*, 2020; 201(10). <https://doi.org/10.1164/rccm.202003-0527LE>
19. Ibn Hubal Baghdadi. *Kitab-Al-Mukhtaratil Tib*. CCRUM Ministry of Health and Family Welfare Government of India, New Delhi, 2007; 4: 237-238. Urdu.
20. Razi AZ. *Kitab-al-Murshid*, (Urdu translation), CCRUM Ministry of Health and Family Welfare Government of India, New Delhi, 1991: 37.
21. P.K.M. Nagarathna, K. Reena, S. Reddy, J. Wesley, Review on Immunomodulation and Immunomodulatory Activity of some Herbal plants. *Int J Pharm Sci Rev Res.*, 2013; 22(1): 223-30.
22. E. Young, Immunology is where intuition goes to die, *The Atlantic*, august 5, 2020 https://www.theatlantic.com/health/archive/2020/08/covid-19-immunity-is-the-pandemics-central-mystery/614956/?utm_source=share&utm_campaign=share
23. A. Park, A. Iwasaki, Type I and Type III Interferons – Induction, Signaling, Evasion, and Application to Combat COVID-19, *Cell Host Microbe*, 2020; 27(6): 870-878. doi: 10.1016/j.chom.2020.05.008
24. A. Grifoni, D. Weiskopf, S.I. Ramirez, J. Mateus, J.M. Dan, C.R. Moderbacher, et al., Targets of T Cell Responses to SARS-CoV-2 Coronavirus in Humans with COVID-19 Disease and Unexposed Individual. *Cell*, 2020; 181: 1489-1501. <https://doi.org/10.1016/j.cell.2020.05.015>
25. Q. Long, X. Tang, Q. Shi, et al., Clinical and immunological assessment of asymptomatic SARS-CoV-2 infections. *Nat Med.*, 2020; 26: 1200–1204. <https://doi.org/10.1038/s41591-020-0965-6>
26. M. Sengupta, G.D. Sharma, B. Chakraborty, Hepatoprotective and immunomodulatory properties of aqueous extract of *Curcuma longa* in Carbon tetrachloride intoxicated Swiss albino mice. *Asian Pacific Journal of tropical biomedicine*, 2011: 193-99.
27. S.F. Majeedi, M. Roqaiya, D. Jahan, A.A. Khan, Immunomodulatory herbs of Unani medicine: A review. *IJHM*, 2015; 3(4): 19-21.
28. Ghani Hakim Najmul. *Qarabadin Najmul Ghani*, Munshi Naval Kishore, Lucknow, 1928: 74-77. Urdu.
29. Anonymous. *National Formulary of Unani Medicine. Part V*. CCRUM, Ministry of Health and Family Welfare, Government of India New Delhi, 1993: 167; 140. Urdu.

30. Anonymous. National Formulary of Unani Medicine. Part I. CCRUM, Ministry of Health and Family Welfare, Government of India New Delhi, 1993: 167, 224, 110, 215. Urdu.
31. Ibn Zuhr Abu-Marwan. Kitab-Al-taiseer fi-Madawa wl-Tadbeer. CCRUM, Ministry of Health and Family Welfare, Government of India, 1986: 13-14. Urdu.
32. Nafees Burhanuddin. Kuliyat Nafisi. Bazaar Nurul-Umra, Hyderabad Dakin, 1934: 196-197, 213. Urdu.
33. Ibn Sina. Al-Qanun Fi-Tib. Munshi Naval Kishore Lucknow, 1929; 4: 89-91. Urdu.
34. I.J. Borges do Nascimento, N. Cacic, H.M. Abdulazeem, T.C. Von Groote, U. Jayarajah, I. Weerasekara, et al., Novel Coronavirus Infection (COVID-19) in Humans: A Scoping Review and Meta-Analysis. J. Clin. Med., 2020; 9: 941-955. doi:10.3390/jcm9040941.
35. M. Cascella, M. Rajnik, A. Cuomo, S.C. Dulebohn, R.D. Napoli, Features, Evaluation and Treatment Coronavirus (COVID-19). StatPearls Publishing. 2020. <https://www.ncbi.nlm.nih.gov/books/NBK554776/>.
36. Z. Nigar, M. Itrat, Evaluation of a Unani polyherbal formulation (Tiryaqe Wabai) as an immunostimulatory in elderly persons. Ancient Science of Life, 2013; 33(2): 119-122. DOI:10.4103/0257-7941.139054.
37. Arzani Hakim Akbar. Qarabadin Qadri, Urdu Bazar, Lahore, 2009: 16,298,422,511-512. Urdu.
38. Hifzul Kabir. Morakkabat (Unani Formulations), Shamsheer Publisher and Distributors, Aligarh, India, 2003: 35, 38, 93, 113. Urdu.