Review

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Understanding COVID-19 in the light of epidemic disease described in Unani medicine

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Abstract: Unani system of medicine is based on the humoral theory postulated by Hippocrates, according to him the state of body health and disease are regulated by qualitative and quantitative equilibrium of four humours. *Amraz-e-Waba* is an umbrella term which is used in Unani medicine for all types of epidemics (smallpox, measles, plague, *Hameer Saifi*, influenza, Nipaha, Ebola, Zika, and 2019 novel coronavirus, etc.) mostly fatal in nature. The coronavirus disease 2019 (COVID-19) is a severe acute respiratory infection, and the pathogenesis and clinical features resemble with those of *Nazla-e-Wabaiya* (influenza) and *Zatul Riya* (pneumonia) which were well described many years ago in Unani text such as high-grade fever, headache, nausea and vomiting, running nose, dry cough, respiratory distress, alternate and small pulse, asthenia, foul smell from breath, insomnia, frothy stool, syncope, coldness in both upper and lower extremities, etc. The World Health Organization declared COVID-19 as a global emergency pandemic. Unani scholars like Hippocrates (370–460 BC), Galen (130–200 AD), Rhazes (865–925 AD), and Avicenna (980–1037 AD) had described four etiological factors for *Amraz-e-Waba viz.*, change in quality of air, water, Earth, and celestial bodies, accordingly

mentioned various preventive measures to be adopted during epidemics such as restriction of movement, isolation or “*quarantena*”, and fumigation with loban (*Styrax benzoin* W. G. Craib ex Hartwich.), sandalwood (*Santalum album* L.), Zafran (*Crocus sativus* L.), myrtle (*Myrtus communis* L.), and roses (*Rosa damascena* Mill.) and use of vinegar (*sirka*) and antidotes (*Tiryaq*) as prophylaxis, and avoiding consumption of milk, oil, sweet, meat, and alcohol. This review focuses and elaborates on the concept, prevention, and probable management of COVID-19 in the light of *Amraz-e-Waba*.

Keywords: *Amraz-e-Waba*; antidotes; coronavirus disease; epidemic disease; fumigation; Unani medicine.

Introduction

The science of the Unani system of medicine is based on Hippocratic theory of four humours: sanguine, phlegm, yellow bile, and black bile [1]. Any disruption in the equilibrium of humours causes disease and thus the treatment seeks to restore balance by employing measures that counteract the deranged humours and temperament, etc. (preventive measures and including drugs) [2]. Furthermore, the Unani system of medicine also believes that *Quwat-e-mudabbir-e-Badan* (medicatrix-naturae) is the supreme force that regulates all the functions of the body and acts against the diseases [3]. There are three causes according to the doctrine of Unani medicine: bodily predisposition, environmental factors, and a mediating cause [4]. The environmental cause is the most common cause of an epidemic or pandemic or *Nazla-e-Wabaiya* [5]. Renowned Unani scholars like Hippocrates (370–460 BC), Galen (130–200 AD), Rhazes (865–925 AD), Avicenna (980–1037 AD) described that, there are four etiological factors responsible for *Amraz-e-Waba* (epidemic disease), i.e., change in quality of air, water, Earth, and celestial bodies [6, 7]. According to Avicenna (980–1037 AD), *Humma-e-Waba* (epidemic fever) is a very acute, fatal

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fever, which is caused due to infected air, and it spreads very rapidly among larger populations [8–10]. There is no direct description in Unani system of medicine about coronavirus in general and in particular coronavirus disease 2019 (COVID-19), but the clinical features of COVID-19 resemble with those of *Nazla-e-Wabaiya*, a type of *Amraz-e-Waba* (epidemic disease) [11]. COVID-19 is an infectious disease caused by the newly discovered novel coronavirus. This disease was unknown until the outbreak began in Wuhan, China, in December 2019 [12]. The most common symptoms of COVID-19 are fever, tiredness, and dry cough. Some patients may have aches and pains, nasal congestion, runny nose, sore throat, or diarrhea and in case of serious illness develop difficulty in breathing. Older people and those with underlying medical conditions including high blood pressure, heart issues, or diabetes mellitus are more likely to develop serious illness [12, 13]. The World Health Organization has declared the COVID-19 as a pandemic and a global health emergency [12, 14]. The number of cases of COVID-19 infection in the world is rising day by day. With the spread in many countries, general measures like isolation, social distancing, and routine use of masks and regular washing of hands are being propagated [12, 15]. Unani medicine places more emphasis on maintaining health and disease prevention along with the treatment.

Methodology

The concept of epidemic diseases (*Amraz-e-Waba*) has been surveyed from literature of Unani medicine such as *Al-Havi Fit Tib* (Liber continence) [7], *Kitabul Mansoori* [9], *Kamil-Us-Sana* (Liber regius) [10], *Al-QanoonFit Tib* (Canon of Medicine) [11], *Zakheera Khvarazm Shahi* (Treasure of Khvarazm Shah) [16], *Kitab Al-Taisir* [17], *Akseer-e-Azam* (Al-Akseer) [18], *Hummiyat-e-Qanoon* [8]. The modern concept of coronavirus in general and COVID-19 in particular was appraised from internet sources such as PubMed, Medline, Scopus, ScienceDirect, Google Scholar, etc. [19–21]. The keywords used are *Amraz-e-Waba*, epidemic disease, coronavirus, antiviral, antioxidant, immunomodulator, and antipyretic.

Concept of epidemic disease (*Amraz-e-Waba*)

Unani medicine attributes infectious disease as the pathogen's success to the vulnerability of the organism to infection (host factors) due to humoral imbalance or

dys temperament [4, 8, 18, 22]. There are three sets of causes in Unani medicine: (i) bodily predisposition – humoral, temperamental or structural; (ii) external causes that are mainly environmental, and (iii) bodily relation causes that are necessary to induce change arising from the interaction of the first two sets [11, 18]. The predisposing and external causes will share an agent to affect health status [4, 18]. The environmental cause is the most common cause of an epidemic or pandemic [4, 5]. Multiple weather changes in one season are less conducive to epidemics than many changes over several seasons, and this is not similar to water expansion [4, 6]. These changes in air are either in its composition or qualities [4, 7]. The change in composition happens when one of its components becomes excessive or rare, and this induces epidemics due to the putrefaction in the air that is similar to that occurring in a pond or stagnant water [4, 6, 8]. Air with high humidity is conducive to epidemics and putrefaction. Additionally, stagnant waters also become moldy [4, 11]. A southerly summer increases epidemics [4].

Avicenna in canon of medicine described that the changes that occur in the air are similar to those of which occur in water, which is why the quality of the air changes to hot or cold and the constituents or temperament of air changes [8, 11]. Due to these changes, changes in color and taste and putrefaction are produced. For example, changes in the taste and color of water occur, which develops foul smell and becomes infected [8, 18]. Also remember that when the water is “pure”, it is not infected until it comes in contact with infected particles (*Ajsam-e-Arziya Khabeesa*), and thus, it mixes with water and pollutes it [8, 9]. Similar is the case with air. When the air is “pure”, it is not infected, it becomes infected when “impure vapors” blend (combine) with it and turn the air into poor quality air [8, 10, 18]. The reason for this change generally is that when the wind travels from one place to another, it brings along infected air and particles with it [11, 18], for example, where there are dirty streams or putrefied corpses, like the air of the battlefield full of dead corpses or infected air due to an epidemic disease which were neither buried nor burnt [8, 16]. As a result of these unpleasant and infective changes in the air, the air of a good area (place) is spoiled. And this change in the air is not due to distant cause, but it is due to proximate cause [8, 11].

Beneath the ground, infection is caused due to various factors and we are unaware of its constituents [8]. These causes then enter air and water, polluting and infecting it. Those epidemic fevers that occur due to dry air are very less when compared to those which occur due to moist air [8, 9]. In dry air, the production of bile is increased and hence it becomes the cause for greater incidences of bilious fever

[11]. And epidemic fevers are produced due to “turbid” and “moistened air” [8]. Fevers are predominantly caused by moist air but they are less severe and are of longer duration because its substance is viscid and hence it resolves gradually [8, 9]. During summers, due to scanty rainfall, fevers are rare but they are very severe and the duration is less, i.e., either the patient regains health quickly or dies very soon [8, 10]. The best season is that which protects the physis and whose special temperament remains constant [5, 8, 18]. All of these changes are due to one of many astral (celestial) positions. The causes of these changes are principle causes, and distant cause is a few [8]. After this, from its weak heat, it affects the heart. The temperament of cardiopulmonary circulation or animal spirit becomes putrid, and the humours are putrefied which lie inside the heart, an abnormal temperature is formed and is spread to the whole body through blood vessels. As a result, epidemic fever is produced and spread to communities or species [8–10].

Indicators that predict epidemic disease (*Amraz-e-Waba*)

An epidemic in summer and in winters is predicted with two different sets of signs. Symptoms are those which appear at the start of *Mausam-e-Khareef* (autumn season) [8–11]. All these signs show that an epidemic is evolved like a cause gives the sign of any disease. If the direction of winds is towards the south and you feel viscid and turbidity in the air and the sky is cloudy such that it rains or when the sky is clear and there is no sign of rainfall, then we should be precautious that winter season has turned morbidic [8–10]. But the signs of deuce and fatal epidemic of summers are that in spring season rains are less and cold is present [5, 8]. And again in summers, south winds flow for few days until it become viscid and after that for more than a week, winds are clear. Then at night, in cold, patient feels extreme heat which means when heat is produced in the air it implies that the epidemic is here [8]. Now epidemic fever and smallpox-like diseases prevail. Similarly, if there is not much heat during summers, “turbidity” is more in air and trees are covered with fog [8–10]. Then, this also is a sign of an upcoming epidemic. Similarly, if you see that the air changes many a times during the day. One day the air is clear and the sunrise is also clearly visible. But the very next day, air becomes turbid, and sunrise is hidden behind the fog [8, 9]. Then the epidemic may be predicted in near future. These signs are produced along with the causes of the epidemic [8, 9, 22]. During these days, frogs are seen, and all insects and bacteria that are formed due to infections are increased.

Similarly, those animals/birds that are light or delicate leave their nests along with their eggs and fly away [8, 22].

The above observation was made by Hippocrates in his book “On epidemics” [9, 11]. These indications may not concur with the view of climatic variation as we know it today. The rudiments of miasmatic theory or fetid air theory of epidemics augur well with it. The theory gave way to germ theory of infectious diseases, but the host factor and the environment are still considered important and necessary factors for spread of disease besides the virulence of the pathogen [7].

Pathogenesis of COVID-19 in the light of humoral theory

According to the Unani concept, infectious disease developed due to abnormal dominance of *Hararat* (hot), *Ratoobat* (moist), and *Ajsam-e-Khabisha* (microbes) [7–9, 23]. In Wuhan, during winter, moist environment increased the risk of viral infection [24]. Presently, season is changing into summer (hot) which also precipitates the spreads of microbes (e.g., viruses, bacteria, fungus) [8, 23, 25, 26]. Rhazi [7, 9] says that, peak summer along with rainy season is one of the most common causes of epidemic diseases. This observation implies that, Unani medicine promotes the elimination of moistness (dampness) from the body during “epidemic situation” with the help of some specific regimes which promotes the lessening of moisture that inhibit the growth of microbes (viruses) [8, 18, 22].

Predisposing factors include dominance of abnormal humours, contact to infected person during epidemic conditions, peak summer along with heavy rains or beginning of rainy season, moist air and direction of air from south to other direction, open orifice, scratch skin and membranes, weak immunity, moist temperament, migration from the place of epidemic, breath infected air, excessive coitus, vulnerable ages are child, adults than older age along with obese person, excessive intakes of alcohol, milk, sweet, meat, watery contain fruits, and oily products [8–10, 16, 22].

Clinical features of *Amraz-e-Waba*

Clinical features of *Amraz-e-Waba* depend on the quality of humours, seasons, quality of air, the direction of air, physis, types of diet, habitants, ages, celestial bodies, contact of microbes (*Ajsam-e-Khabeesha*), etc. [8, 9, 22]. A number of clinical features arise during *Amraz-e-Waba*, such as high-grade fever, headache, nausea and vomiting, dry cough, running nose, pneumonia, hunger breathing,

respiratory distress, alternate and small pulse, loss of appetite, foul smell from breath, dry tongue, asthenia, confusion, insomnia, rashes over the body, splenomegaly, abdominal pain, enlarged lymph nodes, sweating with bad odor, frothy stool, syncope, coldness in both upper and lower extremities, fatal death [6–11, 18, 22].

Preventive measures (*Tahaffuzi Tadabeer*)

Unani medicine recognizes the impact of climate and environmental factors on human health. Temperament is the most basic concept of health promotion and disease prevention [1]. The Unani medicine system classics explicitly state that health care is superior to treatment [5, 11, 18]. During disease conditions, therapy is carried out using the opposite temperament nondrug (diet) and drug factors, whereas, for health maintenance, nondrug factors of the same temperament are often used [2, 3]. Unani medicine puts particular emphasis on the six important factors (*Asbab-e-Sitta Zarooriya*) for health maintenance, i.e., ambient air, food and drink, bodily movement and repose, mental movement and repose, sleep and wakefulness, and evacuation and retention [8, 11].

If the air becomes contaminated and epidemical, one should take precaution by drying the body and adjusting the residence with substances that cool and humidify by their action – this is the correct action in epidemic – or carryout a warming action against the corrupting element. Pleasant and aromatic perfumes are the most effective in this regard, especially if they are antagonistic to the temperament favoring the epidemic [4, 8, 18, 22]. In an epidemic, one should reduce excessive intake of air through ventilation and distribution [4, 5]. Very often, the source of air distortion is from the ground; therefore, it is preferred to sit on sofas and seek well-aerated, high locations for residence [9, 22]. Frequently, the air itself is the source of distortion due to its mixing with neighboring contaminated air or an inexplicable atmospheric cause [4]. In this case, it is better to seek shelter in houses or “*quarantena*” that are surrounded by walls and bedrooms [4, 8]. The incenses most suitable for treating distorted air are galingale (*Cyperus longus* L.), loban (*Styrax benzoin* W. G. Craib ex Hartwich.), myrtle (*Myrtus communis* L.), roses (*Rosa damascena* Mill.), and sandalwood (*Santalum album* L.) [9]. The use of vinegar during epidemics is protective [4, 22]. Hakeem Akbar Arzani (1772 AD) quotes that during the epidemic or pandemic, regular oral use of *Roghan-e-Gao* (cow ghee) along with externally massaged over the body is most effective [18].

Shelters (*Makan*)

Houses of patients with epidemic fever should be kept cool because cold temperature suppresses infection, and infection cannot occur without heat [8, 18]. The house has to be cleaned regularly and air has to be purified [8, 9]. In order to keep the house cool, cold temperament fruits such as Utruj (*Citrus medica* L.) and apple (*Malus domestica* L.), cold aromatic shrubs like Gul-e-Banafsa (*Viola odorata* L.), Gul-e-Nilofar (*Nymphaea alba* L.), Baid Mushk (*Salix alba* L.), and branches of neem (*Azadirachta indica* L.) are kept in the house [8]. *Lakhlakha* (inhalants) and *Nazuhat* (spray) prepared from cold fragrant fruits, *Kafoor*, *Arq-e-Gulab*, *Arq-e-BaidMushk*, *Arq-e-Nilofar* are to be kept at home, and it is best if there is a fountain at home [8, 9, 11].

Drugs (*Advia*)

To a patient with epidemic fever, *Qurs Kafoor* and *ruboob* acting as coolants are given. *Ma-ur-Rayeb* (water of curd) is given to drink, buttermilk, *Arq-e-Gulab*, *Aqueous of Paneer*, vinegar to be mixed with water and given, cold water is also beneficial [8, 11, 22]. But if cold *Sirka* (vinegar) is given very often in heat, it irritates [8, 18]. In severe cases, if there is a feeling of pressure below the ribs and dilatation is present, extremities turn cold, restlessness and delirium happens, then warm clothes should be worn that absorb the heat externally [8].

Diet (*Ghiza*)

Sour foods (*Tursh Ghiza*) are generally recommended but in less quantity, though use of meat is avoided, but, *Halim*, *Qarees*, *Masoos* are foods prepared with meat and vinegar (*Sirka*) or other sour food substance such as Sumaq (*Rhus coriaria* L.), Aab-e-Angur Kham (*Vitis vinifera* L.), Aab-e-Limu (*Citrus limon* L.), Aab-e-Anar (*Punica granatum* L.) are advised [8, 18, 22]. *Mukhallilat* (pickle made using *sirka*) especially “*KibrMakhl*” is very effective, and Hing (*Ferula foetida* L.) is also effective against infections; anorexic patients should be promoted to take food forcefully [8, 22].

Air purification (*Islah-e-Hawa*)

According to the health of the patient, dryness to be produced in the air so as to prevent infection [8, 22]. Air purification can be carried out by the fumigation of some antiseptic drugs like Oodkham (*Aquilaria agallocha* Roxb.), Amber (*Amberis gra-sea*), Kundur (*Boswellia serrata* Roxb.), Mushk (*Moschus moschiferus* L.), Qust Shirin (*Sassurea lappa* Clarke), Sandarus (*Hymenaea verrucosa* Gaertn.) Hing (*Ferula foetida* L.),

Qaranfal (*Syzygium aromaticum* L.), Zafran (*Crocus sativa* L.), Chharela (*Nardostachis jatamansi* L.), Nagarmotha (*Cyperus rotundus* L.), Izkhar (*Andropogon shaenarthus* L.), Abhal (*Juniperus communis* L.), Waj (*Acorus calamus* L.), Badam-Talkh (*Prunus amygdalus* Batsch) [8, 11, 18, 22]. Suggested use of Sirka (*Acetic acid*) and Hing (*Ferula foetida* L.) has also been suggested by Unani physicians as a spray to prevent infection [8, 9, 18, 22].

The following drugs either single or in combination are recommended to use more often as *Bakhoor* (incenses or fumigation) to prevent the microbes and their infection such as Sandal (*S. album* L.), Kafoor (*Cinnamomum camphora* L.), Post Anar (*P. granatum* L.), Tuffa (*M. domestica* L.), Aas (*M. communis* L.), Bahi (*Cydonia oblonga* Miller.), Abnoos (*Diospyros ebenum* J. Koenig ex Retz.), Sazaj (*Cinnamomum tamala* L.), Jhau (*Tamarix dioica* Roxb.) [8, 22].

Regimes (Tadabeer)

To prevent epidemics, “*Ratoobat-e-Fazila*” (morbid humours) from the body should be expelled through *Qai* (vomiting) and *Ishal* (purgation with the help of *Cassia angustifolia* L.) and *Fasd* (venesection) and other essential regimens of *Asbab-e-Sittah Zaruriyah* (six prerequisites for existence) which produces dryness in the body [8, 9, 18, 22], including drugs and reduce food intake, avoiding *Riayzat* (exercise) and *Hammam* (bathing). Moreover, use of drinks restricted to avoid moistness in the body [8, 9, 22]. An antidotes like *Tiryaq-e-Mashridutes*, *Tiryaq-e-Wabai* or *Gil-e-Armani* are recommended by Galenus to use as prophylactic medicine before the being of the air born infection as (*Hawa-e-Wabai*) [8, 18, 22].

Management of the epidemic through Unani medicine

In the Unani system of medicine, there is no description of coronavirus, but the clinical features are similar to those of *Amraz-e-Waba* (epidemic disease) [9]. In Unani literature well description available for epidemic condition and their management [8, 9, 22]. Rhazi and Avicenna suggested following restriction of movements, reduced diet intake, and especially to avoid meat, oil, milk products, and alcohol during epidemics [11, 18]. Protection of vital organs (heart, lungs, brain, and liver) is compulsory [6]. Use antidotes, especially during epidemic conditions [8, 18]. Some antidotes which have been described in Unani literature, such as *Tiryaq-e-Wabai*, *Tiryaq-e-Farooq*, *Tiryaq-e-Arba*, *Tiryaq-e-Nazli*, *Tiryaq-e-Mashridutes*, *Qurs Zahar Mohra*, etc., are used as prophylactics and therapeutics [9–11, 27].

Principles of treatment

Principle of treatment based on “quarantena”, protect the vital organs, exhilarants and cardiac tonics, antidotes, antipyretic and laxative [8, 11, 18, 22].

Situational management of the epidemic

Various drugs or formulation that can be used are follows:

- During high-grade fever, *Joshandah Humma* (10 g) along with *Sharbat Unnab* 20 mL should be used and *Khamirah Marvareed* 5 g [8, 9, 27]. Excess use of *Arqiyat* like *Kiyorah*, *Arq-e-Sandal*, *Arq-e-Gulab*, *Arq-e-Gaozaban*, *Arq-e-Kasni* [11, 18, 27].
- During respiratory distress (*Tanghi Tanaffus*), *Lauq Sapistan* along with *Sharbat-e-Zoofa Murakkab* and *Tiryaq-e-Nazli* will be effective. Steam with *Arq-e-Ajeeb* which promotes the breathing easily due to vasodilatation activity and also reported for antiseptic activity [8–11, 18, 27].
- During Gastrointestinal Tract (GIT) disturbance, *Tiryaq-e-Peches* along with *Jawarish Amla* are recommended [27]. Use of *Qurs Malti Basant* and *Amla Murabba* will be effective along with coconut water [8–11, 18, 27].
- For Daf-e-Sammiyat or immune boost, use of antidotes will be effective: *Qurs Zaharmohra*, *Habbe Jadwar*, *Tiryaq-e-Wabai*, *Tiryaq-e-Farooq*, *Tiryaq-e-Arba*, *Tiryaq-e-Nazli*, etc. [8–11, 18, 27].
- For antistress and calming effect, *Khamira Sandal*, *Khamira Marvareed*, *Khamira Abresham*, *Dawaul Misk Barid*, *Qurs Zahar Mohra*, etc. are used [8–11, 18, 27].
- Famous Unani formulations: There are various Unani formulations which have been described in Unani literature for the management of infectious disease especially during “*Waba*” in the form of *Joshandah*, *Safoof*, *Majoon*, *Khamira* which acts as general tonic (*Muqavvi Badan*), cardi tonic (*Muqavi Qalb*), expectorant (*Munaffise Balgham*), antipyretic (*Dafe Humma*), blood purifier (*Musaffi Dam*), etc. [8, 9, 11, 27]. Some of them are named as *Joshandah Nazla*, *Majoon Ushba*, *Majoon Chobchini*, *Khamira Sandal*, *Khamira Marvareed*, *Qurs Zahar Mohra*, *Habbe Jadwar*, *Tiryaq-e-Wabai*, *Tiryaq-e-Farooq*, *Tiryaq-e-Arba*, *Tiryaq-e-Nazli*, *Tiryaq-e-Ufai*, *Qurs Kafoor*, and *Gile Armani* along with vinegar, etc. [8–11, 16, 18, 22, 27].

The above mentioned strategies for management of epidemics like COVID-19 make it necessary as when to initiate the specific drugs. It is summarized in the form of (Table 1) that briefs about the management at various stages of COVID-19 [12, 13].

Table 1: Described interventions for various stages of COVID-19 in the light of Unani medicine.

S. No	Group of peoples [13]	Proposed intervention[12, 13]
1	Unexposed asymptomatic group	For maintenance of health, Unani medicine specially emphasized on the modulation of six essential factors (<i>Asbab-e-Sitta Zarooriya</i>), i.e., air, food and drink, bodily movement and repose, psychic movement and repose, sleep and wakefulness, and evacuation and retention, and also use of <i>Tiryag-e-Wabai</i> as prophylaxis.
2	Exposed asymptomatic (quarantined)	Home stay, air purification with <i>Loban</i> or <i>SaadKofi</i> , use of <i>Joshandah</i> (<i>Unnab</i> , <i>Sapistan</i> , <i>Bahidana</i> , <i>Mulethi</i> , <i>Gilo</i> , <i>Zanjbeel</i> , <i>Filfil Daraj</i>) along with <i>Khameera Marwareed</i> , and inhalation with <i>Arq-e-Ajeeb</i> .
3	With mild COVID-19 symptoms	Use <i>Joshandah</i> (<i>Mulethi</i> , <i>Gilo</i> , <i>Tulsi</i> , <i>Kalonji</i> , <i>Zanjbeel</i> , <i>Filfil Daraj</i> , <i>Chiraita</i> , <i>Shahtara</i>) along with <i>Khameera Marwareed</i> , <i>Habb-e-Bukhar</i> and inhalation with <i>Arq-e-Ajeeb</i> .
4	With moderate to severe COVID-19 symptoms	Use <i>Joshanda</i> (<i>Mulethi</i> , <i>Gilo</i> , <i>Tulsi</i> , <i>Zanjbeel</i> , <i>Filfil Daraj</i> , <i>Chiraita</i> , <i>Shahtara</i> , <i>Afsanteen</i> , <i>Zafran</i>) along with <i>Khameera Marwareed</i> , <i>Habb-e-Bukhar</i> , <i>Habb-e-Surfa</i> , <i>Chaiwanprash</i> and inhalation with <i>Arq-e-Ajeeb</i> .

COVID-19, coronavirus disease 2019.

Certain formulations which are acclaimed for managing epidemics with flu-like symptoms are described as follows:

- *Joshandah Nazla Wabaiya*: It has been used since centuries for the management of respiratory disorders and pyrexia of unknown origin [8, 11, 27]. It has antioxidant, immunomodulator, antipyretic, antiviral, antiinflammatory, and expectorant activity. Its ingredients are as following with reported actions (Table 2) [28, 53].
- *Joshandah Sual*: It is based on polyherbal formulation, which contains 11 ingredients. It has antioxidant, immunomodulator, antipyretic, antiviral, antiinflammatory, and expectorant activity. Its ingredients are as following with reported actions (Table 3). [28–30, 37–40, 50–92].
- *Method of use*: As decoction twice a day for 7–14 days, and decoction can be taken with *Sharbat-e-Unnab* or honey (excepts diabetes patients).
- *Tiryag-e-Wabai*: It is based on three ingredients which is especially used during epidemic condition and described by renowned Unani scholars Rhazes, Majusi, Avicenna, Ismail Jorjani, Hakim Azam Khan, etc. [7–11, 16, 18]. It has antioxidant, immunomodulator, antipyretic, antiviral, antiinflammatory, and expectorant activity. Its ingredients are as following with reported actions (Table 4). [93–108]. It is used in the form of 3 g *Safoof* (powder) thrice a day with *Arq-e-Kiyora* for 7–14 days.
- *Arq-e-Ajeeb*: *Arq-e-Ajeeb* is a liquid preparation obtained by mixing *Kafoor*, *Jauhar-e-Pudina*, and *Jauhar-e-Ajwayin* at room temperature in the quantity given below (Table 5) [109, 110]. It is prepared by taking all the three ingredients of pharmacopeial quality. Crush them separately to make their coarse powder, then mix as per composition of formulations in an air tight glass container, and allow liquefying and filtering. When the transparent homogenous liquid is obtained, fill it in moisture-free glass bottles [109, 110]. The drug can be taken orally with water, applied locally, as well as in the steam [109, 110].

Table 2: Scientific report and details of the ingredients of *Joshandah Nazla Wabaiya* for potential use in COVID-19.

S. No.	Unani name	Botanical name	Useful parts	Weight	Pharmacological activities	References
1	Unnab	<i>Ziziphus jujube</i> Mill.	Fruit	5 Adad	Antiviral, antioxidant, immunomodulator	[28–30]
2	Sapistan	<i>Cordia myxa</i> L.	Fruit	9 Adad	Antioxidant, immunomodulator, hypoglycemic, antitussive, analgesic	[31–33]
3	Bahidana	<i>Cydonia oblonga</i> Mill.	Seeds	3 g	Antiviral, antiallergic, antioxidant, antimicrobial	[34–36]
4	GuleBanafsa	<i>Viola odorata</i> L.	Flower	7 g	Antioxidant, hepatoprotective, antibacterial, hypnotic, antiviral	[37–40]
5	Khubazi	<i>Malva sylvestris</i> L.	Seeds	5 g	Antiviral, antioxidant immunomodulator	[41–43]
6	Khatmi	<i>Althea officinalis</i> L.	Seeds	5 g	Antioxidant immunomodulator, antibacterial, antiviral, antitussive, bronchiodilator	[44–49]
7	Mulethi	<i>Glycyrrhiza glabra</i> L.	Root	5 g	Anticoronavirus activity, antiviral, antimicrobial, antioxidant, antiinflammatory activities.	[50–53]

Adad, piece/no.; COVID-19, coronavirus disease 2019.

Table 3: Scientific report and details of the ingredients of *Joshandah Sual* for potential use in COVID-19.

S. No.	Unani name	Botanical name	Useful parts	Weight	Pharmacological activities	References
1	Mulethi	<i>Glycyrrhiza glabra</i> L.	Root	5 g	Anticoronavirus activity, antiviral, antimicrobial, antioxidant, antiinflammatory activities	[50–53]
2	Gilo	<i>Tinospora cordifolia</i> Willd.	Stem	9 g	Antiviral, immunomodulator, antioxidant, analgesic, antipyretic activity	[54–57]
3	Tulsi leaves	<i>Oscimum sanctum</i> L.	Leaves	5 g	Antiviral, analgesic, antipyretic, immunomodulator, antipneumonia.	[58–63]
4	Shoneez	<i>Nigella sativa</i> L.	Seeds	2 g	Antiviral, immunomodulator, antioxidant, antimicrobial, analgesic, antiinflammatory, antipyretic, bronchodilator activity	[64–69]
5	Zanjbeel	<i>Zingiber officinale</i> Roscoe	Rhizome	1 g	Antiviral, antioxidant, immunomodulator, antimicrobial, analgesic, antiinflammatory, cough suppressing and bronchodilator activity	[70–76]
6	FilfilDaraz	<i>Piper longum</i> L.	Fruit	2 g	Antiviral, analgesic, antipyretic, immunomodulator, antiasthmatic activity.	[77–81]
7	Unnab	<i>Ziziphus jujube</i> Mill.	Fruit	5 Adad	Antiviral, antioxidant, immunomodulator, antiasthmatic, cardio protective activity.	[28–30, 82, 83]
8	GuleSurkh	<i>Rosa damascena</i> Mill.	Flowers	7 g	Antiviral, analgesic, antiinflammatory, antioxidant, hepatoprotective	[84–86]
9	GuleBanafsa	<i>Viola odorata</i> L.	Flowers	7 g	Antioxidant, hepatoprotective, antibacterial, hypnotic effect, antiviral.	[37–40]
10	Chiraita	<i>Swertia chirata</i> L.	Whole plant	7 g	Antiviral, antipyretic, antioxidant, analgesic.	[87–89]
11	Shahtara	<i>Fumaria officinalis</i> L.	Whole plant	7 g	Analgesic, antipyretic, antioxidant, diuretic, antimicrobial.	[90–92]

COVID-19, coronavirus disease 2019.

Table 4: Scientific report and details of the ingredients of *Tiryqa-e-Wabai* for potential use in COVID-19.

S. No.	Unani name	Botanical name	Useful parts	Weight	Pharmacological activities	References
1	Sibr	<i>Aloe barbedensis</i> L.	Pulp	2 g	Antiviral, antipyretic, antioxidant, immunomodulator	[93–97]
2	Zafran	<i>Crocus sativus</i> L.	Stamen	1 g	Antiviral, antioxidant, immunomodulator, bronchodilator, cardio protective activity	[98–102]
3	Murmukki	<i>Commiphora myrrha</i> (Nees)	Gum	1 g	Analgesic, anti-inflammatory, antioxidant, immunomodulator, hepatoprotective, antimicrobial.	[103–108]

COVID-19, coronavirus disease 2019.

Table 5: Unani description for *Arq-e-Ajeeb* during *Amraz-e-Waba*.

S. No.	Unani name	Botanical name	Useful parts	Weight	Indications in Unani pharmacopeia [109, 110]
1	Kafoor	<i>Cinnamomum camphora</i> L.	Camphor	2 g	Nazla, Zukham, Sual, WajaulBatan, Ghisyan, Qai, Haiza,
2	Jauhar-e-Pudina	<i>Mentha arvensis</i> L.	Menthol	2 g	Zaheer, Lasa waLadag, Hisasia/Arjiyyah, WajaulMafasil, Suda.
3	Jauhar-e-Ajwayin	<i>Trachyspermum ammi</i> L.	Thymol	1 g	

Discussion

The Covid-19 infection is pandemic caused by a novel coronavirus a new strain of virus in humans belong to beta coronoviridea family; basically it affects the lungs and causes severe acute respiratory symptoms, and the virus

hosts ACE2 receptors in the lungs and other parts of the body including kidney [111]. The symptoms of COVID-19 may range from mild, moderate to severe; around 86% of cases usually reported moderate symptoms of fever, dry cough, sore throat, and diarrhea and among severely infected cases, respiratory and multiorgan failure [15, 24].

Since Unani medicine treats it as “*Amraz-e-Waba*” or “*Nazla-e-Wabaiya*” that spreads through air, the same has been validated recently [8, 9, 11]. The droplets in microns settle in the air after a longer time of 10 min [111–114]. The preventive measures are well defined which are collectively called as measures of social distancing [115]. The measures that are mentioned in terms of sheltering in Unani are included for social distancing. Its management has been two pronged in Unani medicine [8–11, 22]. One is to revert the air quality to a pure form, i.e., to decontaminate the places of contact of the virus and the other is to manage the person who has contracted the disease [14]. Management is followed for febrile persons with upper respiratory tract (URT) symptoms in whom the formulations are used that are effective in flu patients [116]. Moreover, these formulations have got reported antiviral actions. The ingredients of the exemplified formulations have shown to be antiviral, antioxidant, immunomodulator, and antipyretic activities. Though the studies are pre-clinical but reports suggest their usefulness as antiviral. The patients who develop the signs for respiratory distress know drugs with immunomodulatory (*Mulethi*, *Gilo*, *Asgand*, *Tulsi*, *Spirulina*, *Zafran*, *Sibr/Aelwa*, *Kalonji*) [117–118] effect are useful if treated quickly. The cytokine storms caused by the virus cannot be arrested by immune stimulants that may aggravate the condition and prove fatal, but immune suppressants or modulator immune responding drugs are of some help. The various ingredients in these formulations especially *Sibr* (*Aloe barbedensis* L.), *Zafran* (*Crocus sativus* L.), and *Murmakki* (*Commiphoramyrrha* (Nees)) will definitely be of help [119]. Some drugs like *Zafran*, *Tulsi*, *Chaube Zard*, *Neem* have been reported as thrombolytics also [120–122]. It may be a matter of time when these drugs are developed as a measure for management for COVID-19.

Conclusions

The above review showed the potential to cure the drugs commonly called galenicals from the ancient practitioner's armamentarium. It is hoped that further research on these will pave a way forward to arrest such epidemics.

Highlights

- Coronavirus disease 2019 (COVID-19) has been declared a global emergency by the World Health Organization.
- According to Unani literature, COVID-19 is a type of *Amraz-e-Waba* or *Nazla-e-Wabaiya*.

- *Amraz-e-Waba* are contagious, and some of them spreads rapidly, and are fatal also.
- People with malign humours and diminished immunity are more susceptible to *Amraz-e-Waba*.
- During *Amraz-e-Waba*, social distancing, restriction of movement, use of disinfectants, and fumigation and use of vinegar, and anti-dotes as prophylaxis.

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