

Postulation of Siddha tri-humoral vitiation in pathogenesis of novel Corona virus disease

Review Article

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Abstract

Background: On March 12, 2020, WHO declared Novel Coronavirus disease as a pandemic outbreak all over the world. The outbreak had led the medical sector to a new platform, in the implementation of ancient knowledge of the Siddha medicine in treatment, management, and prevention of this prevailing pandemic. According to Siddha science, any vitiation in the life force is the main cause of diseases in human beings. pandemic diseases caused due to infectious microorganisms are called '*Kollai Noigal*' in various Siddha literatures. **Aim and objective:** To classify the Novel Coronavirus disease based on the Siddha Humoural principles and to elicit the changes of *Ninety-six Thatthuvam* (Ninety - six basic principles), *Uyir Thathukkal* and *Udal Thathukkal*. **Materials and methods:** This study is accomplished mainly for literature research. Various Siddha texts such as *Sattamuni gnanam*, *Agathiyar Gunavagadam*, *Agathiyar vallathi Naadi*, *Theraiyar Sekarappa*, etc. were referred. Numerous research articles on COVID 19 were critically reviewed from Scopus, PubMed, Google Scholar, etc. **Discussion:** By critically reviewing the signs and symptoms of COVID-19 with Siddha science, the authors had thrown light especially on the involvement of all basic components of the *Tri thodam* particularly *Mukkutram verupadu* (Tri humoral vitiation) in eliciting the pathogenesis of the disease. **Conclusion:** In this scientific review, the authors have attempted to comprehend the pathogenesis of Novel coronavirus disease in the context of Siddha's basic principles.

Key Words: *Kollai noigal*, Pandemic disease, *Siddha*, Tri humoral vitiation, Novel coronavirus disease, Pathogenesis.

Introduction

In late 2019, numerous cases of pneumonia had been reported in China, which was later evaluated, that it was caused by an unknown virus then, and now named Novel coronavirus (1,2). The pandemic emerged from the virus was named as SARS-Cov -2 and the disease caused by it was termed COVID-19. The World Health Organization (WHO) on March 12, 2020, reported with 24,189,413 affected, and 8, 26,135 deaths were observed in more than 210 countries (1,3). Coronaviruses are one among the large group of viruses (4). They consist of a core of genetic material surrounded by an envelope with protein spikes. This gives it an appearance of a crown. Crown in Latin is called Corona, and that is how these viruses get their name (5). The novel coronavirus is a single-stranded positive-sense RNA genome, which is surrounded by double-layer lipid, derived from the intracellular Rough endoplasmic reticulum and Golgi membrane of the

infected cells. With genome sizes ranging from 26 to 32 kilobases (kb) in length, CoVs have the largest genomes for RNA viruses (6). There are different types of coronaviruses that cause respiratory and sometimes gastrointestinal symptoms (4). Based on genetic and antigenic criteria, CoVs is classified into three groups namely, α -CoVs, β -CoVs and γ -CoVs(6). Respiratory diseases can range from the common cold to pneumonia and in most people, the symptoms tend to be mild. However, some types of coronaviruses can cause severe diseases (3,7). Few examples of emerging respiratory viruses include, Severe Acute Respiratory Syndrome Coronavirus (SARS - CoV), first identified in China in 2002, H1N1 influenza in 2009, the Middle East Respiratory Syndrome Coronavirus (MERS- CoV) in 2012, and Novel coronavirus was first identified in China in 2019(8,9,10).

The coronaviral genome encodes four major structural proteins: The spike (S) protein, Nucleocapsid (N) protein, Membrane (M) protein, and The Envelope (E) protein, all of which are required to produce a structurally complete viral particle. However, recently it has become clear that some CoVs do not require the full ensemble of structural proteins to form a complete infectious virion, suggesting that some structural proteins might be dispensable or these CoVs might encode additional proteins with overlapping compensatory functions (6).

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Siddha system of medicine is one of the AYUSH systems of medicine. It is a system of medicine that was bestowed by 18 Siddhars for creating a disease-free world. This system of medicine revolves around the theories of *Panchabootham*, *Three Uyir Thathukkal* (Three humours), *Ninety-six Thathuvam* (96 Basic principles), and *Seven Udal Thathukkal* (7 Physical constituents). Siddhars explained the *Prabanja urpathi* (Cosmogeneration) based on the various works of literature.

According to *Sattamuni Gnanam* (11), the universe originally consists of subtle atoms that contribute to the *Panchabootham* (Five basic elements) namely *Prithvi* (earth), *Appu* (water), *Theyu* (fire), *Vayu* (air), and *Aagayam* (ether). These correspond to the five senses of the human body and are the fundamental of all corporeal things in the world. A close relationship is found to exist between the external world and the internal system of man. Siddhars declare the human form to be a miniature form in the world itself. If we travel as an onlooker into the human body starting from the surface, we find earth as the first obvious element; it gives the shape to the body. It includes bones, tissues, muscles, skin, hair, etc. Water is the second element and it is represented by blood, gland secretions, and vital fluids within the body. Fire is the third element which facilitates the digestion of physical food, mental impressions, and expressions; it also imparts emotion, vigor, vitality, and intelligence to the physical system. Air helps in the absorption of digested energy and it is responsible for circulation, stimulation, and the respiratory and nervous systems. Above all, Ether characterizes man's mental and spiritual faculties. A suitable proportion of these five elements in combination with each other works harmoniously to produce a healthy organic mechanism, without which life is not possible (11). Life forces in the human are equivalent to cosmic forces in the universe. Life forces in the human consist of *Three Uyir Thathukkal* (Three Humours), *Seven Udal Thathukkal* (Seven Physical constituents), and *Ninety - Six Thathuvam* (Ninety -Six basic principles). Any vitiation in life forces is the main source of diseases in the human being, in turn, it also has its stern impact over the universe causing a pandemic outbreak of a disease across the world. The impact may not only be an outbreak of disease it may also be a tornado, tsunami, cyclone, flood, etc.(12,13) In this article, the authors have also tried to correlate the COVID-19 (Novel coronavirus) pathogenesis in terms of Siddha basic principles for scientific validation of the disease with modern concepts.

Aims and Objectives

This review article is intended to elucidate the concept of the pathogenesis of COVID 19, like the condition mentioned in the Siddha system of medicine, along with its correlation to homeostasis and pathogenesis in context to modern medical sciences. Our article is based on the following objectives.

- Classification of Novel Coronavirus disease based on the Siddha Humoral principles.

- To elicit the changes of *Ninety-six Thathuvam* (Ninety - six basic principles), *Uyir Thathukkal* and *Udal Thathukkal* based on the Siddha principle.

Materials and Methods

This study is carried out mainly for literature research. Various Siddha texts such as *Sattamuni gnanam*, *Agathiyar Gunavagadam*, *Agathiyar vallathi Naadi*, *Theraiyar Sekarappa*, *Siddha maruthuvanaga churukkam*, *Udal thathuvam*, *Noi Naadal Noi muthal Naadal Part 1&2*, *Noi Illa Neri*, *Agathiyar Naadi nool*, *18 Siddhar Naadi Nool*, *Sigicharathnadeepam*, *Yugi vaithiya Chintamani 800*, etc. were referred and several modern references, regarding homeostasis and pathogenesis were reviewed.

Origin and cause of disease

Sage Agathiyar had enumerated and classified diseases into 4448 types (12,14,15). Any disease which affects mankind irrespective of time could be mapped into one of these 4448 types of identified diseases. According to *Agathiyar Vallathi Naadi*(16), the diseases result from the complex interaction between Man, Agent, and the environment.

Schematic Explanation of COVID -19 Pathogenesis

Initially, the *Nunkirumi/ Nunuyir* (Microorganism) (26) exhibits the predominant feature of *Pitham* humour. *Nunkirumi/ Nunuyir* (Microorganism)(26) enters the nasopharyngeal route, which is regarded as the *Kabasthanam* (14,17) (Natural habitat of *Kabam*) according to Siddha literature of regional division of *Mukuttaram* (Three humours) in the body. The infectious agents from the nasopharyngeal route evolve and lodge itself into the lung which is regarded as *Pithasthanam* (Natural habitat of *Pitham*) (14,17).

Incubation & Asymptomatic stage (Stage I COVID):

The *Nunkirumi/ Nunuyir* (Microorganism)(26)after entering the lungs (*Pithasthanam*)(14,17) alters the equilibrium of *Mukuttaram* in the lungs. Initially, the *Agni* (Heat energy), *kurooram* (Ferocious) which is the *Iyarkai gunam* (Natural characters) of the *Pitha* humour is altered. Subsequently, the *balu* (Stability) and *vazvazhuppu thanmai* (viscous nature) which is the predominant natural character of *kabam* starts to lose its nature due to altered *Pitham* humour. (14)

As the infection is clogged and lodged in the *Pithasthanam*, the *Pitham* starts increasing, in turn causing *kabam* humour to lose its stability and viscous nature. So, initially, the affected *kuttram* in the lung is *Pithakabam* (Stage of viral replication). Primarily, *Pitham*, when gets deranged, it leads to the accumulation of undigested stuff called *Seetham* (Aamam)(14) in the intestine, as stated in *Theran Sekerappa*(11) entitled under the *Pinigalin mudhal karam "Kudarthanil Seetham Allathu Suram varathu"* (14) on the other hand, *Kaba* humour (*Migu gunam*'s) gets increased in their locations.

Any vitiation in *Kabam* may not be shown up initially, as the Novel Coronavirus disease remains asymptomatic or mildly symptomatic in the early days of infection which is a characteristic feature of *Kabam kuttram*. Since *Kabam* has *Balu gunam* (heaviness) it tends to remain subtle until it reaches its peak of *maathirai* (expansile unit of pulse) ratio and hence natural properties & functions of *Kabam* are altered. (14,15)

Mild to moderate disease (Stage II COVID)

In several percentage of affected cases, *Migu suram* (High-grade fever) sustains from the early symptomatic stage to severe form of illness. This sustainability also comes under the characteristic feature of *Kabam kuttram* due to its *Sthira gunam* (stability factor), *Vazha vazhappu thanmai* (Viscous nature) (14).

Irumal, (Dry cough), and *Thondai vali* (Throat pain) (15,18) occur when *Vatham* conjoins with *Kabam* and the symptoms are due to the *kulirchi* (coldness) and *varatchi* (14) (dryness) *gunam* of the *Vatham* and *Kabam* respectively. Signs and symptoms surfacing in the beginning due to decreased *Pitham* and increased *Kabam kuttram* exhibit ailment due to *Vathakabam kuttram*. If this *Vathakabam* stage is left untreated, it might progress and affect the *Udhaanan* Throat center (*Melnokkunkaal*) and *Abanan* – Mooladharam center (*Keezhnokkunkaal*) (14,15,17) by causing symptoms like *suva* *inmai* (loss of taste), *Swasakasam* (Mild breathing difficulty), *Vaanthi* (Vomiting) and *Kazhichal* (Diarrhoea). (15,18)

This derangement of *Vatham* and *Kabam* in turn starts to deteriorate the *Pitham* kuttram by further affecting the natural character of *Udalagni* (14) in the affected sites. This causes *Pitham* in the body to fall off in its natural place (*Pithasthanam*). (14)

Severe disease (Stage III of COVID)

As the quote says, '*Pitham adangidil pesadhe poividum*' (14,19,20) this is the stage of severe illness. In this stage due to the fall of *Pitham*, more and more of *Sali* / *Kozhai* (*Sputum*) (14) an increased feature of *Kabam* starts to accumulate in the chest which is the predominant regional zone (*mandalam/ Sthanam*) of *Pitham* and the chest becomes heavy due to *Balu gunam* (heaviness) of *Kabam*. In this stage, *Balu gunam* of *Kabam* accumulates and spreads to other parts of the lungs due to vitiated *Vatham* humour. Hence, the affected kuttram in this stage is *Kabavatham*. (14)

In this disease, a jelly-like liquid called *Kozhai* / *Sali* (hyaluronan) accumulates in the lung which is a potential cause of fatalities caused through Acute Respiratory Distress Syndrome (ARDS).

In this stage, *Vatham* precipitate symptoms like cough with expectoration are caused due to the decreased action of *Udhaanan- Melnokkunkaal*. This causes symptoms like difficulty in breathing, cyanosis, etc. that leads to respiratory failure. (3)

Vatham humour is aggravated due to an increase in its natural characters namely *Kulirchi* (coldness) and *Varatchi* (dryness) in the infected site leading to

functional loss. In this, stage, the *Kabam* kuttram accumulates and spreads to other parts in the lungs due to vitiated *vatham* humour. Hence, the affected kuttram in the severe disease stage is *Kabavatham*. (14)

The critical stage of the disease

In this critical stage, the affected *Kabavatha* kuttram manifests into a severe form of the disease leading to a condition like Acute Respiratory Distress Syndrome (ARDS). (3) Here, the body's equilibrium is dismantled due to decreased *Pitham* humour, which is considered to maintain the whole equilibrium/ homeostasis of the body (14).

Hence, the body maintains the equilibrium; it stimulates the *Pitham* humour to its normal state as part of the self-defense mechanism. Here, self-defense is considered as part of the characteristic of *Pitham*. This self-defense mechanism stimulates distinct antigen-antibody reactions to maintain the normal equilibrium of *Mukuttram*. But, due to the severe stage of the disease, the *Pitham* tries to decrease the virulence of the virus by releasing cytokines. Continuous release of cytokine leads to Cytokine storm (19,20) where affected *Kuttram* fulminates to an end-stage condition called *Mukutram suram* (14,17).

Total functional loss of *Pitham* in the body is a grave sign, which is clearly explained by *Sage Agathiyar* under the title "*Marana kurigunakkal*" (14,18,21,22,23) (Grave sign's). It clearly explains that the *Pitham* humour increases and decreases after which it stands by for a particular period. This period of *Pitham* humour causes signs of death and it can be considered synonymous to the deaths caused by Novel coronavirus disease.

Discussion

In the Siddha system of medicine, the disease is described clearly based on *Mukutra verupadu* (vitiation of three humours) in the body. Novel coronavirus disease has been declared as a pandemic infectious disease by WHO. According to Siddha literature, the infectious pandemic disease is known as *Kollai noigal* (13,24,25) which emerges mostly during seasonal variation or any infection caused by *Nunkirumi* / *Nunuyir* (Microorganism) (26) namely Chickenpox (*Ammal*), Plague (*Mahagamari*), Cholera (*Uzhi noi*), etc. Siddhars have explained all these under the title of *Kirumi noigal in Guru naadi soothiram by the Sage Agathiyar* (28,29). (*Kirumi noigal are not only disease caused worms but also disease caused by any type of microbe, hence this term was coined.*)

According to *Sage Theraiyar* quoted in his treatise *Theraiyar sekarappa*, (11) "*Kudathanil Seetham alladhu suram varathu*" explains clearly that the main reason for *Suram* (fever) is caused by lodging of *Seetham* (Amam) in the intestine. In context with this disease, WHO has staged diseases into 4 types, based on clinical features.

Mukutra verupadu in each stage are as follows, as the infection is clogged and lodged in the *Pithasthanam*, the *Pitham* starts increasing, in turn,

causing *Kabam* humor to lose its stability and viscous nature. So, initially, the affected kuttram in the lung is *Pithakabam* in the Incubation & Asymptomatic stage (Stage I COVID). In the case of the mild and moderate stage of the disease, the signs and symptoms surfacing in the beginning due to decreased *Pitham* and increased *Kabam kuttram* exhibits ailment due to *Vathakabam kuttram*. In the severe stage of the disease, *Balu* gunam of *Kabam* accumulates and spreads to other parts in the lungs due to vitiated *Vatham* humour. Hence, the affected kuttram in this stage is *Kabavatham*. In the critical stage, the affected *Kabavatha kuttram* manifests into a severe form of the disease leading to the conditions like Acute respiratory distress syndrome (ARDS). In this stage, affected kuttram, fulminates to end-stage called *Mukukutra Suram*.

The concept of *Mukukutra verupadu* plays a vital role in framing the treatment, management, and prevention protocols. In context with the Novel coronavirus disease first and foremost thing is to concentrate on eliciting the root cause of the disease based on the alteration of *Ninety –six thatthuvam*, *Uyir thathukkal*, and *Udal thathukkal*. Here the initial line of treatment can be adopted to improve the vitiated *Uyir thathukkal* followed by the administration of medicines based on the affected *Mukukutra*, *Arusuvaigal* (Six tastes), and their connections with *Panchabhootham* (Five elements). Also, medicines are prescribed to remove the accumulated *Kabam / Seetham* (Aamam) and thus to normalize the functions of *Dasavayus* (Ten vital airs) and *Dasanadigal* (Ten energy channels).

Conclusion

Siddha medicine is one of the traditional medical systems of India which emphasizes on the treatment, prevention, and management of diseases. By considering the Novel coronavirus disease as a life-threatening pandemic condition, the need of the hour is to pay attention to all the aspects to treat, prevent, and manage the outspread of the disease by controlling the transmission. In the management of various public health problems, infectious diseases, and non-communicable diseases, the Siddha system of medicine undoubtedly plays an impeccable role in addressing various treatment modalities based on classical literature. This scientific review is based on the concept of understanding the novel Covid-19 disease through the Siddha system of medicine in brief and its probable *Mukukutra Verupadu* (Tri -Humoural vitiation). The study also gives a brief insight to find out further relevant and suitable way of treatment, management, and prevention of the contemporary Novel coronavirus disease in the prevailing pandemic.

Acknowledgement

Special thanks to the Director, NIS for granting permission to undertake the work; and Dr. C.P Gokulakumar MD(s) Dindugal, for his valuable guidance.

Source of funding: None

Conflict of interest: None

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Fig 1 describes the Siddha tri- humoral vitiation of the new coronavirus diseases along with the pathogenesis and stages of the disease.

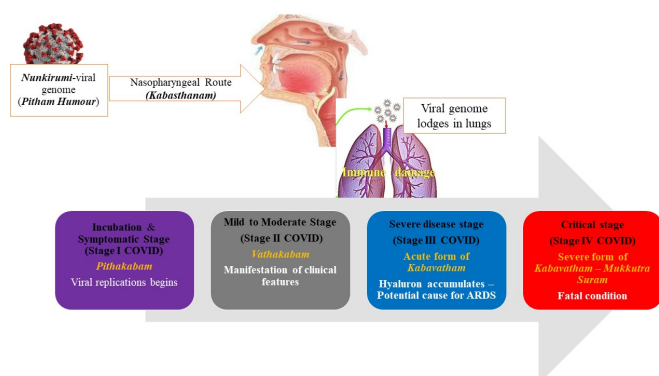


Fig 2: Origin and cause of disease



Fig 3.1: SIDDHA PATHOGENESIS OF NOVEL CORONAVIRUS DISEASE

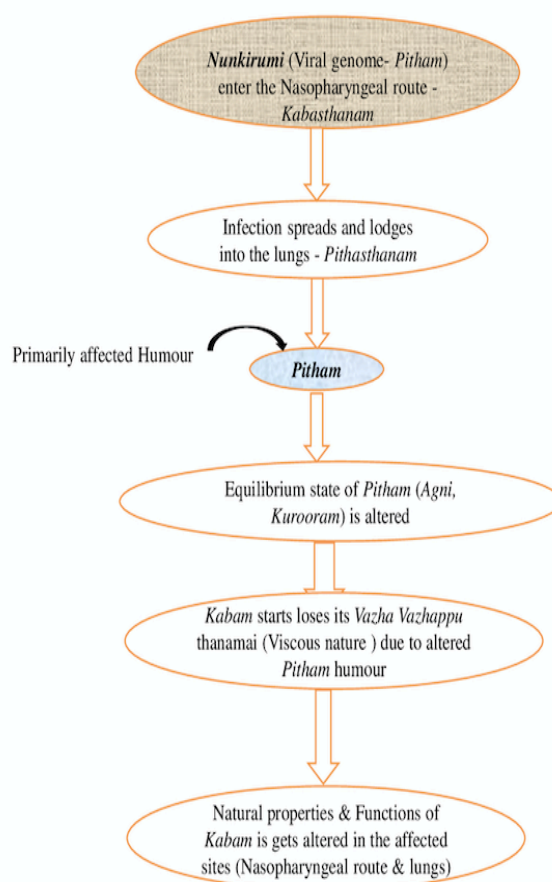


Fig 3.2:

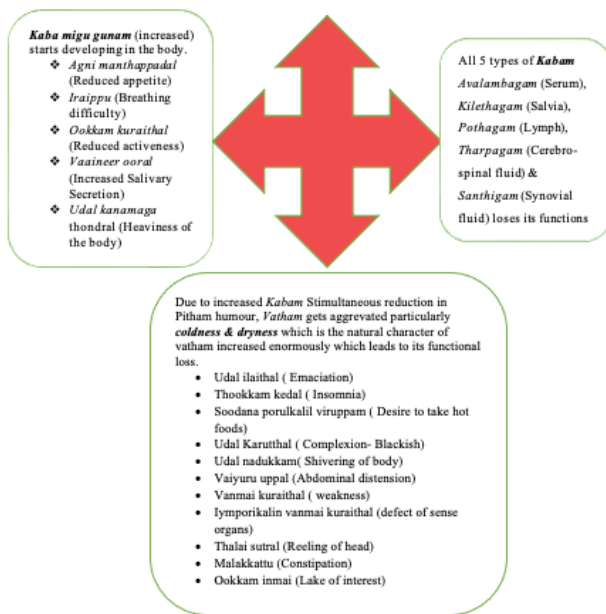


Fig 3.3

