

**Janapadodhwansa in Ayurveda and its Contemporary Relevance to COVID-19****Dr. Savita Arjun Wale**

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**Abstract**

Ayurveda, the science of life, is the most ancient doctrine of human civilisation. Some of basic principles described in Ayurveda are still same as today's medical science. The outbreak of a mysterious new coronavirus disease (COVID-19) is rapidly spreading. The whole world is going through the fear of COVID-19. The outbreak was recognised as a pandemic by World Health Organisation (WHO) on 11<sup>th</sup> March 2020.<sup>1</sup> The study of such epidemic and pandemic disease comes under epidemiology branch of medicine. Ayurveda summarises all the concepts of outbreak, epidemic, pandemic and endemic in one word as Janapadodhwansa. The principle regarding epidemiology described in Ayurveda can be compiled, analysed and interpreted with respect to COVID-19 epidemiology.

In Ayurveda, Rakshasa, Bhut, Yakshma, can be refer to agent causing infectious disease. Moreover, Acharya Sushrut says one of the cause of epidemic as Rakshasa in Rutucharya Adhyaya of Sutrasthana, it will breakdown living culture and produce Janapadodhwansa.<sup>2</sup> Also, Lord Shiva created a creature with three heads, nine eyes, short legs and belly, directed it to be jwara(disease) in the world during the condition of unwholesomeness (Apharantareshu).<sup>3</sup> These agent is not confined to produce particular disease but refers to all microbes causing disease in the past such as SARS, MARS, Swine flu, Bird flu, Ebola virus, etc. or will produce disease in future. Here, in this study these agents can be refer to coronavirus which produces COVID-19 (coronavirus disease).

Considering COVID-19 as Anukta (unnamed) Vyadhi in Ayurveda, we can elaborate its Vikara Prakruti(natural history of disease), Adhistanam (Site) and Sammuthana (aetiology) by analysing its clinical feature. We can consider it as vaatapholbana heen pitta sannipataja jwara<sup>4</sup> in which vitiation of both vayu and kapha predominates over the vitiation of pitta. Having Ascertained the COVID-19 as sannipatajajwara and nature of the disease with considering the relative aggravation of dosas, the disease should be treated with appropriate drugs keeping in view the line of treatment prescribed for each dosa. Chikitsa Sutra (management guidelines) of COVID-19 include jwarashamanam, kaphashamanam, vaatanulomanam and protection of rogi- balam.

Keywords: Janapadodhwansa, Epidemiology, Rakshasa, Coronavirus, COVID-19, Sannipataja Jwara

**Introduction**

**D**isease free condition is the source of virtue, wealth, gratification and emancipation while diseases are destroyers of the source, welfare and life itself. The disease had appeared as a great obstacle for human being so Ayurveda emerges for the welfare of living creatures providing knowledge of aetiology, symptomology and therapeutics, best way for both the healthy and sick tri-aphorismic, continuing for time immemorial and virtuous.<sup>5</sup> In this article, Ayurvedic view on epidemiology along with COVID-19 pandemic has been discussed.

The 2019-2020 coronavirus pandemic is an ongoing pandemic of coronavirus disease 2019 (COVID-19) caused by the severe acute respiratory

syndrome coronavirus-2 (SARS-COV-2).The outbreak was first identified in Wuhan, Hubei, China in December 2019. The World Health Organisation (WHO) declared the outbreak to be a Public Health Emergency of International Concern on 30 January 2020. As of 30 March 2020, more than 735,500 cases of COVID-19 have been reported in over 190 countries and territories, resulting in approximately 34,500 deaths. More than 156,000 people have since recovered.<sup>6</sup>

As per the Ayurveda treatises, there are two types of etiological factors of disease i.e. *sadharan* (common) and *asadharan* (uncommon). *Asadharan* (uncommon) is exclusive for each individual i.e. dietary pattern, physical features, psychological attributes etc. *Sadharan* or common viz. air, water, place and time pertain to large population these when

vitiated produce common disorders in the form of pandemic which annihilate entire community.<sup>7</sup>In spite of difference of constitution, etc. factors of human beings there are other common factors which when vitiated manifest the ailment simultaneously and with similar clinical features and annihilate community. Natural calamities of high magnitude such as floods, famine, cyclone etc. leads to mass destruction. Apart from this calamities disease can also leads to such destruction on a mass scale. Such destruction is termed as *Janapadodhwansa*.<sup>8</sup>*Janpad* means large population or community and *Udhwansa* means destruction of community. Today, whole world is facing COVID-19 as *Janapadodhwansavyadhi*.

Certain basic principles described in Ayurveda have remained intact and are still same as today's medical science. This could be equally applicable to the realm of epidemiology which is branch of medicine that deals with the study of distribution and determinants of health related states or events in specified population and the application of this study to control of health problems. Population, as with individuals have unique pattern of disease. The science of epidemiology which straddles biology, clinical medicine, social science and ecology seeks to describe, understand and utilize these patterns to improve health.<sup>9</sup> This article attempts to unravel concepts of epidemiology described elsewhere in classical treatise of Ayurveda. The concept described in those days holds equal importance as compared to concept of modern medicine. Concepts those are found relevant to present era are described in this study.

### Objective

Now a days, COVID-19 is threatening the whole world. So, the idea of such theoretical research stemmed out and the specific objectives of review were to

- Critically appraise the concepts of epidemiology in Ayurveda.
- Interpret their contemporary significance with respect to coronavirus.

### Methodology

The present work is primarily based on theoretical research. Classical treatises of Ayurveda and internet based search including WHO website,

wikipedia, google search, etc. were used for the study. The classical treatises of Ayurveda don't use such modern terminology hence approximate or equivalent terms were obtained from Central Council of Indian Medicine, India.

### Aetiology (HETU) Of Disease

The aetiology (*hetu*) of *janapadodhwansa* (epidemic) is described in Ayurveda. Chakrapani one of the critics of Charak, says that although individual differ in physical constitution, food habits, suitability, strength, immunity, age, sex, etc. they do get affected with disease owing to vitiation of some factors that are common to all those who inhabit in that community. These factors lead to simultaneous manifestation of disease having the same set of symptoms among all the inhabitants leading to widespread manifestation in the community. The factors that are common to all the individuals in community include air, water, land and season. Again Acharya Charak has divided the aetiological factors into two different categories as a *Niyata hetu* and *Aniyatahetu*. The *Niyatahetu* are category of inevitable factors that affect commonly to all the individuals in particular community and include the harmful effects of sun, moon, stars and planets such as floods, cyclone, landslides, earthquakes and tsunami. *Aniyata hetu* is the evitable disastrous factors that includes *Prajnaparadha* (terrorism, accidents, etc.), *Shastra prabhavaja* (wars, nuclear weapons, missiles, etc advanced weapons), *Bhutabhisyangaja*<sup>10</sup> (effects of pathogen such as virus, bacteria, etc. and unhygienic conditions) and *Abhishapaja* (curse). Besides affecting the individuals these factors also affects the entire community resulting in widespread disease known as *Janapadodhwansa Rogas*.<sup>11</sup> Now, let us understand the concept of causation of coronavirus disease (COVID-19) in Ayurvedic aspect. It can be grouped under the class of *Bhutabhisangajam*<sup>12</sup> (microbiological aetiology). In modern epidemiology, the concept of disease causation is understood by "Epidemiological Triad". Its components are agent, host factors and environmental factors.

### Agent

The term agent is primarily referred to the infectious microorganism (pathogen) such as virus, bacteria, fungi, parasites or other microbes. The virus

that caused the outbreak is known as SARS-COV-2 a new virus closely related to bat coronavirus pangolin coronavirus and SARS-COV.

In Ayurveda, the term *Bhut*, *Yakshma*, *Rakshasa* refers to agent causing infectious disease. Sushruta says one of the cause of epidemic as *kadachidavyapanneshuapiRutushu* (inappropriate season), *Krutya* (wrong karma), *Abhishap* (Curse of animals and kind), *Rakshasa* (demons such as viruses and bacteria etc), *Krodha* (disrespectful for nature), *Adharma* (non religiously), it will breakdown living culture, vitiated air like substance and it creates effect to convert or mutant to nation and produce *Janapadodhwansa*. Here, the term *Rakshasa* not only specifically confined to particular pathogen but also all pathogen which already produced disease in past such as SARS, MARS, Ebola, Chikunguniya, yellow fever, bird flu, swine flu, etc. or produce disease in future.

Also, in Ayurveda, *jwara* (fever) is mentioned as chief among disease. Initial appearance of fever is due to *parigraha* (Receiving) and Rudra's wrath. The fire of wrath which due to fear holds the weapon of ashes, possesses three heads, nine eyes is disturbed with burning flames, fierce and gradually has short legs and belly. It was directed by Lord Shiva to *bejwara* (fever) in the world during the birth, death and also in conditions of unwholesomeness (*Apacharantereshu*). Chinese authority initially reported that most patients in Wuhan outbreaks were epidemiologically linked to large seafood and living animal market suggesting a possible zoonotic origin. The market was closed on 1<sup>st</sup> January 2020 for disinfection.<sup>13</sup> The market which was source of infection can be considered as an example of unwholesomeness (*Apacharantereshu*).

#### Host factor

Host factors are intrinsic factors that are peculiar to a particular host. These factors influence an individual's exposure, susceptibility or response to causative agent. Factors such as age, genetic composition, nutritional and immunological status, physical structure, presence of disease or medication and psychological makeup are some of the host factors that affect a person's susceptibility and response to an agent.

In Ayurvedic point of view, host factor comprises deranged *dosas* of body and mind of a person as a source of origin of *jwara* (here

*jwara* refers to *vyadhi* or disease) because fever does not arise persons devoid of the same. In addition, Ayurveda described the host factor in the form of erratic human behaviour (*prajnaparadha*) responsible for disease causation.

#### Environmental factor

Environmental factors are extrinsic factors which affects the agent and opportunity for exposure. Usually these factors include physical factors such as geology, climate and physical surrounding; biologic such as anthropods that transmit the agent; and socioeconomic factors such as income, crowding, sanitation and availability of health services.

In Ayurveda, *Janapadodhwansa adhyaya* (chapter) of Charak Samhita compiles extrinsic factors for producing epidemic. *Janapadodhwansa* occurs due to vitiation of *vayu*, *jala*, *desha* and *kala*. This concept can very well compared with environmental pollution or individual forms of pollution such as air pollution and water pollution. The role of environmental pollution in causation of human disease is undisputable. Over the recent years, despite the major efforts that have been made to clean up the environment, pollution remains a major problem and poses continuing risks to health.

#### Coronavirus Disease (COVID-19)- An Anukta Vyadhi

Ayurveda has unique methods of approaching a newly detected disease rather than focusing on microbiological aetiology. Ayurveda embraces a holistic technique for elaborating the details of the disease at hand. We have a three pointed approach in the elaboration of *anukta* (unnamed) *vyadhi*.

1. *Vikara Prakruti* (natural history of disease)
2. *Adhisthanam* (the role of pathological process)
3. *Samuthana visesham* (Etiological Factor)<sup>14</sup>

#### Vikara Prakruti

While considering *vikar prakruti*, primarily, as COVID-19 has evolved itself into a pandemic i.e. *Janapadodhwansa vikara*.<sup>15</sup> Hence, identification of the suitable pathological model along with associated features is important. Referring to the details available from the places where COVID-19 has maximally affected and especially from China, almost 40% cases were very mild with no symptoms

of viral pneumonia, another 40% cases were having moderate symptoms with mild pneumonia, 15% were having sever symptoms and 5 % were critical to presentation. Generally 98% patients were having mild to moderate fever (*jawaram*), 76% were having cough (*kasam*) and 44% were having myalgia (*angamardam*) and fatigue (*tandra*).

Among these developed pneumonia, 99% were having fever (*jawaram*), 70% were having fatigue (*tandra*), 59% were having dry cough (*vaatikakasam*), 40% were having anorexia (*aruchi*), 35% were having myalgia (*angamardam*), 31% were having dyspnea (*swasam*), 27% were having sputum production (*kaphaj kasam*).<sup>16</sup>

Many patients were reported with fever, dry cough and minimal respiratory disorders. Later the fever subsided but the respiratory distress became severe and many died.

Considering all these factors, COVID-19 can be considered as *kapha-vaata samsargaja jawaram*,<sup>17</sup> of course with pitta association<sup>18</sup> in the beginning. But it acquires the status of a full *sannipataja jawaram*<sup>19</sup> in which kapha-vayu predominates over the vitiation of pitta. Hence, COVID-19 can be considered as *vaatkapholbanna* (severe *vaat* and *kapha*) *awar* (mild) pitta *sannipataja jawaram* comparing with the clinical features mentioned in classics.<sup>20</sup>

**Adhishthanam- Site**

The proper *adhishthanam* of COVID-19 can be suspected as *koshtam* itself, but the manifestation happens in *urasa*, which itself is a predominant site of *kapha*. Many a time, it has been found that *pittadosha* exerts a significant pathological influence on *kapham*. The *ushnaguna* of *pitta* in combination with the *sa-sneha* and *dravaguna* will exerts pathological effect on *kapha*, thereby making it *a-sthira* (unstable) and *a-badha* (unboundable ). Here, *pitta* as on triggers this pathological cascade leading to the *syandana* and further *shosham*. This can lead to *dhaatupaakam* and death.

**Samuthaanavishesham – the etiology**

The occurrence of *kapha-vaata* predominant *sannipaatajwara* as a *Janspada-udhwansa* in *vasantarutu* points to the rapid and violent vitiation of *vayu*, *udaka*, *desha* and *kala* due to activities that can be earmarked as *prajanaaparaadha*.<sup>21</sup>

**Different Stages Of Disease**

*Shatkriyakala* is one of the age old principles described in classical treatise of Ayurveda. It describes different stages of disease formation in its own unique way. Different stages of *shatkriyakala* as compared with epidemiology of disease are described in Table no. 1.

**Table no 1: The concept of Shatkriyakala compared with epidemiology**

<i>Shatkriyakala</i> in Ayurveda	English equivalent to Ayurvedic concept	Concept of Epidemiology
<i>Sanchaya and Prakopa</i>	Stage of accumulation and vitiation	Stage of susceptibility
<i>Prasara and Sthanashanshraya</i>	Stage of dissemination and localization	Stage of pre-symptomatic disease
<i>Vyakti</i>	Stage of manifestation	Stage of clinical disease
<i>Bheda</i>	Stage of complication	Stage of diminished capacity

Albeit many authorities compare it simply with pathogenesis but a meticulous look unravel its relation with epidemiology of communicable diseases such as coronavirus disease. The concept of *Shatkriyakala* is of utmost importance from public health intervention point of view and more especially from the perspective of disease control stratagem. *Kriyakala* gives an opportunity at each stage to halt the disease process.

The stage of *sanchaya* and *prakopa* can be comparable with that of the stage of susceptibility. The stage of susceptibility is also called as stage of pre-pathogenesis. In this stage, the risk factors and the host should interact with each other in suitable and favourable environment for the disease to occur (healthy individual to get infected) . This has been also rightly said by Acharya Charaka that *Beej* (seed) soaked in *Bhoomi* (land) flourishes only in correct time (proper environment). *Dosha* vitiate (microorganism ought to vitiate doshas) *dhatu*s if *dhatubala* (immunity) depletes. In first and second stage of *shatkriyakala*, *dosha* get accumulated and vitiated. Hence, certain intervention can be put in situ to halt the disease progress. Modern medicine emphasizes primary prevention at the stage of

susceptibility. The community level examples are advocacy of proper *Dincharya*(daily health promotional activities), *Ritucharya* (health promotional activities during season), *Ahara*(specific dietary regimen), *Vyayam*(exercise)etc.

At third and fourth stage,*prasara* and *sthanashanshraya* the vitiated or aggravated *dosas* start moving and get settled at particular organ or organ system. This may deceive a physician owing to its very nature. At this stage the disease neither clearly evident nor completely buried. Hence, the diagnosis of disease becomes difficult at this stage. The modern tools and techniques cannot identify the disease at this stage. This stage is comparable with that of pre-symptomatic disease where the disease process has already begun but the overt signs and symptoms are not evident. At this stage, preventive measures can be applied. The mode of intervention in secondary prevention is early diagnosis and treatment.

The fifth stage of *kriyakala* is *vyakti* whose disease is clinically manifested. This is comparable with the stage of clinical disease in epidemiology. As this stage is marked with clinical signs and symptoms the mode of intervention at this stage would be easily diagnosis and treatment. The examples at the community level are early diagnosis by *nadi parikshana* (examination of pulse), *darshana*(inspection), *sparshana*(palpation) and *prashana*(interrogation)etc. and treatment by *shaman*(alleviation) and *sodhana* (purification) modalities described in Ayurveda.

The last stage of *shatkriyakala* is *bhedas* which is the most dangerous and complicated stage in disease process. This stage is comparable with the stage of diminished capacity. This stage may end up with recovery, disability or death. The modes of intervention instituted at this stage are disability limitation and re-habilitation. At community level intervention includes panchakarma.

**Modes Of Communicable Disease (EPIDEMIC)**

**Transmission**

Acharya sushrut one of the proponents of Ayurveda has depicted modes of communicable disease transmission in his classical treatise Sushrut Samhita. He says physical contact (*gatransparshat*), expired air (*nishwasat*), eating with others in same plate (*sahabhajanat*), sharing

bed (*sahashayyanacchapi*) using cloths, garments and paste (*vastramalyanupsevanat*) infectious disease spread from person to person.<sup>22</sup> This concept is very much relevant today.

According to WHO the primary mode of transmission of coronavirus disease is via respiratory droplet that people cough or exhales. For example, while coughing and sneezing virus is carried by the droplet released, it remains viable still able to infect people in aerosols for at least 3 hours. The virus is viable for infection upto 3 days on plastic and stainless steel, for 1 day on card board and upto 4 hours on copper. When the virus drops on metal surface it will live for atleast 12 hours. The virus can remain active on fabric for 6 to 12 hours.<sup>23</sup>

**Signs And Symptoms (RUPA)**

Acharya Sushrut describes symptoms of *Janapadodhwansavyadhi* as *kaasa* (coughing), *shwasa* (breathlessness), *vamathu* (vomiting), *pratishaya* (running nose), *shiroroga* (headache), *jwara* (fever). This is not particular to any disease it is generalised symptoms seen in any kind of *Janspadodhwansa* as in coronavirus disease too.

**Pathogenesis (SAMPARPTI) Of Coronavirus**

Referring to signs and symptoms manifested in patients of coronavirus disease it can be considered as *sannipataja jwara* mentioned in Charak Samhita. The symptoms mentioned in classical treatise are coldness, pneumonia, anorexia, drowsiness, thirst, burning sensation and pain with *jwara* in which *kapha-vayu* predominates over the vitiation of *pitta* in *vaatkapholbanna awar pitta*(severe vaat and *kapha*, mild *pitta*)*sannipataja jwara*. Hence, coronavirus disease can be considered as *kaphavaatsannipataja jwara*. *Samprapti* (pathogenesis) of coronavirus disease comprises *kaphavaatsannipataja jwara* associated with *pitta* even if very mild, will be causing *syandana* and *shoshana* in chest progressively producing persistent dry cough, which cannot be resisted by the body due to already compromised *rogibalam*. This process can be technically described as *dhaatupakka* a dysregulated host response from the context of *saanipaatajwara*.<sup>24</sup> This results in the rapid instability of *ojas* leading to sepsis and eventually septic shock. Because of the *syandana* and *shoshana*

property of intervening *pitta*, the *jwara* may end up in the fatal form of *sannipataj jwara*.

Patient infected with COVID-19 showed higher leukocyte numbers, abnormal respiratory findings and increased level of plasma pro-inflammatory cytokines. The patient's sputum showed positive real time polymerase chain reaction results that confirmed COVID-19 infection. Additionally high blood C –reactive protein was noted in positive patients. High erythrocytes sedimentation rate and D-dimer were observed. The main pathogenesis of COVID 19 infection as a respiratory system targeting virus was severe pneumonia, RNAemia combined with the incidence of ground glass opacities and acute cardiac injury.<sup>25</sup>

### Preventive Measures

Acharya Sushrut mentioned preventive measures for *janapadodhwansa vyadhi* are *sthanaparityaga* (return to home), *shantikarma* (work and maintain peace), *prayaschit* (ready to pay for penalty), *mangal* ( being prosperous), *japa* (keep mind busy), *hom* (rituals habits like hand wash), *uphare* (gift right scene), *ejyanjali* (sacrifices), *namskar*, *tapo* (austerity), *niyamas* (make and follow the rules), *daya* (kind towards living beings), *dana* (contribution), *diksha* (purpose of purifying world), *abhayupgama* (acceptance) and pray together to god you definitely get win.<sup>26</sup> All these preventive measures can be applied to prevent COVID-19.

### Chikitsa Sutra

*Chikitsa Sutra* (Management guide lines) of COVID-19 includes *jwarasanmanam*, *kapha samanam*, *vaataanulomaanam* and protection of *rogibalama* as a primary protocol. Further regulation of the status of *pitta*, especially its *drava* and *ushnagunas*. Particularly important in geriatric and those with co-morbidities, as this is the junction in which the fatal pathological processes starts. In the state of complication, medicine to stop *dhatu paakam* is started and medications for bronchodilation and expectoration is initiated.

### Conclusion

It is interesting to note that the concepts described centuries back are very much relevant to contemporary era and their significance cannot be neglected. The concept of *Janapadodhwansa*, *Shatkriyakala* and approach to *Anukta Vyadhi* delineated in classical treatises of Ayurveda are of

great significance and their contemporary relevance needs to capitalise. The strategies described in *Shatkriyakala* for the prevention and management of clinical entities can be applied at individual and community level which bears considerable public health importance. COVID-19 as *Anukta Vyadhi* in Ayurveda, can be described in detail for the preventive and management purpose with the help of Ayurveda.

COVID-19 can be considered as *vaatkapholbanna awar pitta sannipataja jwara*. Preventive measures should be followed strictly by the citizen of country to avoid spread of *janapadodhwansa* (pandemic). Management guidelines for COVID-19 includes *vaatanulomanam*, *kaphashaman*, *jwarashamanam* and protection of *rogi-balam*. Ayurvedic physician must get the opportunity to treat such pandemic of Covid-19. Moreover, the in-depth analysis of concepts of Ayurveda in the light of modern contemporary science is only possible with those scholars who know both Ayurveda and the relevant concepts in modern medicine. The crux of this point is that Ayurveda requires interdisciplinary research which is the need of the hour and should be performed in chorus with the scholars who can contribute to such research.

### References

- <sup>1</sup>WHO-Director-General's opening remarks at the media briefing on COVID-19-11 March 2020. World Health Organisation. Retrieved 11 March 2020.
- <sup>2</sup> Kaviraj Ambikadutta Shastri, Editor. Sushrut Samhita Vol I Sutrasthana Adhyaya 6, verse no.21, Varanasi: Choukhamba Sanskrit Sansthan; Reprint, 2011. page no.30
- <sup>3</sup>Prof. Priyavrat Sharma, Editor. Charak Samhita Vol. II Chikitsasthana Adyaya 3, verse no. 25, Varanasi: Choukhamba Orientalia; Edition 2014. Page no.54.
- <sup>4</sup>Prof. Priyavrat Sharma, Editor. Charak Samhita Vol. II Chikitsasthana Adyaya 3, verse no. 92, Varanasi: Choukhamba Orientalia; Edition 2014. page no. 61
- <sup>5</sup>Prof. Priyavrat Sharma, Editor. Charak Samhita Vol. II Chikitsasthana Adyaya 3, verse no. 15-24, Varanasi: Choukhamba Orientalia; Edition 2014. page no. 54
- <sup>6</sup>[www.en.m.wikipedia.org/wiki/2019%E2%80%932020\\_coronavirus\\_pandemic](http://www.en.m.wikipedia.org/wiki/2019%E2%80%932020_coronavirus_pandemic) Retrieved 30 March 2020.
- <sup>7</sup>Prof. Priyavrat Sharma, Editor. Charak Samhita Vol I Ayurveda Dipika commentary of Chakrapani Datta. Vimansthana-3 Shloka 1-2. Varanasi: Choukhamba Orientalia; Edition 2014.

- <sup>8</sup>Prof. Priyavrat Sharma, Editor. Charak Samhita Vol I Ayurveda Dipika commentary of Chakrapani Datta. Vimansthana- 3 Shloka 3-5. Varanasi: Choukhamba Orientalia; Edition 2014.
- <sup>9</sup>Bhopal RS. Concept of Epidemiology: An integrated Introduction to the Ideas, Theories, Principles and Methods of Epidemiology. Oxford: Oxford University Press; 2002.
- <sup>10</sup>Prof. Priyavrat Sharma, Editor. Charak Samhita Vol. II Chikitsasthana Adyaya 3, verse no. 114, Varanasi: Choukhamba Orientalia; Edition 2014. page No.155
- <sup>11</sup>Acharya YT, Editor. Charak Samhita (Chakrapani on Ch.Vi.3/2), Varanasi: Chowkhaba Surbharati;2000.
- <sup>12</sup>Prof. Priyavrat Sharma, Editor. Charak Samhita Vol. II Chikitsasthana Adyaya 3, verse no. 114,page No.155.
- <sup>13</sup>The Coronavirus Disease 2019(COVID-19) Pubmed Article link: <https://doi.org/10.3928//19382359-20200219-01>. Retrieved 26<sup>th</sup> March 2020
- <sup>14</sup>Dr.Brahmanand Tripathi,Acharya Vaagbhatta, Ashtang Hrudayam, Delhi:Choukhamba Sanskrit Pratishthan; Reprint 2017. Acharya Vagbhatta, Ashtanga Hrudayam,Sutrasthana 12/66, Page No.181
- <sup>15</sup>Prof. Priyavrat Sharma, Editor. Charak Samhita Vol I Ayurveda Dipika commentary of Chakrapani Datta. Vimansthana- 3, Shloka 5 Varanasi: Choukhamba Orientalia; Edition 2014.
- <sup>16</sup>HuangC et al, Clinical features of patients infected with 2019 novel coronavirus in Wuhan city,China Lancet,January 2020.
- <sup>17</sup>Dr.Brahmanand Tripathi,Acharya Vaagbhatta, Ashtang Hrudayam, Nidana Sthana 2/25. Delhi:Choukhamba Sanskrit Pratishthan; Reprint 2017. Page no. 438
- <sup>18</sup>Dr.Brahmanand Tripathi,Acharya Vaagbhatta, Ashtang Hrudayam,, chikitsa sthana 1/16. Delhi:Choukhamba Sanskrit Pratishthan; Reprint 2017. Page no. 555
- <sup>19</sup>Prof. Priyavrat Sharma, Editor. Charak Samhita Vol. II Chikitsasthana Adyaya 3, verse no. 103, Varanasi: Choukhamba Orientalia; Edition 2014.page no. 61
- <sup>20</sup>Prof. Priyavrat Sharma, Editor. Charak Samhita Vol. II Chikitsasthana Adyaya 3, verse no. 92 Varanasi: Choukhamba Orientalia; Edition 2014. page no.61
- <sup>21</sup>Dr. Sasikumar Nechiyil. Ayurvedic Diagnostic and Management Protocol for COVID-19,2020.
- <sup>22</sup>Kaviraj Ambikadutta Shastri, Editor. Sushrut Samhita, nidanasthana 5/32-33 Varanasi:Choukhamba Sanskrit Sansthan;Reprint,2011..
- <sup>23</sup>[www.wikipedia.org/wiki/2019-20\\_coronavirus\\_pandemic](http://www.wikipedia.org/wiki/2019-20_coronavirus_pandemic)
- <sup>24</sup>Dr.Brahmanand Tripathi,Acharya Vaagbhatta, Ashtang Hrudayam, Nidansthana 2/60 Delhi:Choukhamba Sanskrit Pratishthan; Reprint 2017. Page no.444.
- <sup>25</sup><https://www.sciencedirect.com> Retrieved 27 March,2020.
- <sup>26</sup>Kaviraj Ambikadutta Shastri, Editor. Sushrut Samhita,Sutrasthana 6/22. Varanasi:Choukhamba Sanskrit Sansthan;Reprint,2011. Page no. 31

