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# A classical approach to explore probable etiology of Janapadodhwansa caused by COVID-19 - A diagnostic perspective in Ayurveda

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## ABSTRACT

**Background:** Outbreak of COVID-19 has raised concerns all over the globe due to its high transmission capability and potential of leading to grave prognosis. Researches are being conducted to understand the disease pathophysiology as well as to develop vaccine and specific therapeutic interventions. Safe, effective and easily accessible solutions from traditional healthcare system like Ayurveda are also warranted. In order to provide solutions, the disease itself must be first understood in the light of Ayurveda principles. **Aim:** To study and search classical Ayurveda treatises to understand the etiology, pathophysiology and nature of COVID-19. **Methodology:** Understanding the pandemic nature of COVID-19, a search was conducted in *Brihatrayi* to find similar concept described in Ayurveda. With the help of that link further literature study was conducted to reach up to the probable etiology and nature of the COVID-19 according to Ayurveda. The clinical profile of COVID-19 was obtained by referring published scientific literature till date. **Discussion:** It was observed that, *Janapadodhwansa* explained by *Charaka* describes the same concept of epidemic or pandemic. Further the causes of *Janapadodhwansa* listed by *Charaka* were evaluated. The clinical features of manifestation of diseases caused by these factors were studied and compared with those of COVID-19. The study revealed that, the cause, nature and manifestation of *Keetavisha* toxicity explained in Ayurveda shares similarity with COVID-19 in many aspects. With the help of this, one can also explain the various characteristics of COVID-19 like asymptomatic nature in many cases, severity and grave complications in some cases, potential of leading to death and transmission of the diseases. **Conclusion:** Therefore, it was concluded that, the nature of the disease developing in humans due to SARS-Cov-2 infection is comparable to the *Keeta Visha* toxicity according to Ayurveda.

**Key words:** COVID-19, Ayurveda Nidana, Janapadodhwansa, Keetavisha, Bhutasangha.

## INTRODUCTION

The novel corona virus has rapidly spread from its origin in China to the rest of the world. The virus has raised concern because of its high transmission capability and potential of leading to grave prognosis. All over the globe, studies are conducted not just to

find the targeted pharmacotherapy but also to understand the pathophysiology of the disease. Since nature, pathology and features of the disease are still not completely clear, currently only supportive and empirical treatment is offered to treat COVID-19 patients. However, there are multiple limitations and adverse effects associated with these conventional medicines. Thus, therapeutic solutions from traditional medicinal systems like Ayurveda are also warranted to combat the current situation. In order to find and implement specific therapeutic strategies for COVID-19, one must also understand the nature of the disease, its probable pathophysiology and etiological factors according to the principles of Ayurveda.

The diseases that are not explicitly mentioned in classical literature of Ayurveda are called as *Anukta vyadhi*.<sup>[1]</sup> Charaka says, if a physician does not know a

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certain disease, he must try to comprehend the nature of the disease, the site of its manifestation and its etiological factors. After having full knowledge of these factors, if a physician initiates a treatment, he would never fail in his attempt to restore the health.<sup>[2]</sup> On the basis of this guideline, literature search was conducted to find the possibility of correlation between pandemic nature of COVID-19 and any such disease concept described in Ayurveda. It was observed that, *Janapadodhwansa* explained by *Charaka*<sup>[3]</sup> points towards the concept of epidemic or pandemic. Thus, further detail analysis of this topic was conducted to find probable etiology, nature and pathology of Covid-19 according to Ayurveda on the basis of available scientific data and study of classical literature of Ayurveda.

#### **Janapadodhwansa**

*Janapadodhwansa* has been defined as destruction of human settlements or communities by means of natural or man-made calamities including epidemics.<sup>[4]</sup> *Charaka* has attributed the outbreak of *Janapadodhwansa* to vitiation of factors like *Vayu* (Air), *Jalam* (Water), *Desha* (Land) and *Kala* (Time/season) which are common factors for every individual living in a particular region. Along with that, use of weapons (war), affliction by evil spirits (*Rakshasas*) or other creatures and, curse by preceptors are the other 3 potential causes of *Janapadodhwansa* listed by *Charaka*.<sup>[5]</sup> We tried to evaluate every causative factor of *Janapadodhwansa* to find out the possible link between these factors and nature, etiology and presentation of current pandemic of COVID-19.

#### **Vitiated Air, Water, Land and Season**

These are the factors which are common for each and every individual of a community in a particular region. Thus, when these are adversely affected, they can affect the entire community with same disease and similar symptoms simultaneously. A brief account on the signs of each of the vitiated factors is available in *Charaka Samhita*.<sup>[3],[6]</sup> It is stated that, when any of the above 4 environmental factors are vitiated in a manner as described in the text, they can lead to

*Janapadodhwansa*. After reviewing these factors, we comprehended that, such vitiation of air, water, land or seasons is not distinctly observed around the globe in the current time. Even though it is perceived at first instance that the causative factor for COVID-19 is vitiated air; classical references from Ayurveda describing features of vitiated air do not support this hypothesis.<sup>[3],[6]</sup> It is difficult to justify or prove that, one or more of above mentioned factors are vitiated in a way described in the treatises and are instrumental in the spread of pandemic of COVID-19. Thus, we ruled out the possibility of resemblance between, the natures of COVID-19 causative factor and vitiated air/water/land/season which are mentioned as causative factors for *Janopadodhwansa*.

#### **Weapons & Curse by preceptors**

It is evident that, this public health emergency arising due to COVID-19 is neither due to any kind of war/weapons nor due to Curse by preceptors and thus, in the context of COVID-19, we ruled out both these causes of *Janapadodhwansa* mentioned by *Charaka*.<sup>[5]</sup>

#### **Rakshoganadi (Evil spirits) or Bhutasangha (other creatures)**

*Rakshogana* or *Bhutasangha* is another reason of *Janapadodhwansa* mentioned by *Charaka*. A human being is believed to develop a disease also due to some exogenous factors known as '*Bhuta*' that include evil spirits and other (living) creatures etc.<sup>[5]</sup> Clinical features of many such afflictions have been discussed in detail in relevant chapters of the classical treatises. Therefore, the study of the classical literature was carried out to look out for similarity between COVID-19 clinical features and clinical presentation described in such afflictions.

#### **Rakshoganadi (Evil spirits)**

The term '*Raksha*' is explained by the commentator *Chakrapani* as *Rakshasadi*.<sup>[7]</sup> While explaining the management of *Unmada* (~Psychosis) *Chakrapani* states that, the term '*Raksha*' encompasses *Rakshas* and *Brahma Rakshasas*.<sup>[8]</sup> The term '*Gana*' indicates group. Therefore, one can include various invisible evil

spirits mentioned as disease-causing entities under this group. This group therefore would include *Deva*, *Pishacha*, *Gandharva* etc.<sup>[8]</sup> *Charaka* has described distinct clinical features of the diseases caused due to affliction by *Rakshogana* and those predominantly include psychological and behavioral abnormalities.<sup>[9]</sup> *Sushruta* has also mentioned various evil spirits and included all of them under '*Devagana*'. The similar explanation for these terms can be found in *Sushruta* and *Dalhana's* commentary on it.<sup>[10][11][12]</sup> The clinical features described by *Sushruta* for such afflictions are also chiefly psychosomatic.<sup>[13]</sup> Since the clinical features of COVID-19 do not match with any of these afflictions we ruled out the cause of current *Janapadodhwansa* as affliction by evil spirits.

#### **Bhutasangha (other creatures)**

*Bhutasangha* is another term used by *Charaka* while listing causes for *Janapadodhwansa*.<sup>[5]</sup> The term *Bhuta* has been used at multiple places in varied context by *Charaka* and does not always necessarily indicate evil spirits only. Various meanings of the term '*Bhuta*' in *Charaka Samhita* as described by commentator *Chakrapani* are living beings [*Cha. Sha. 1/51, 63*], Living beings like Evil spirits [*Cha. Su. 11/37, Cha. Sha. 1/121*] and *Savishakrumi* (Poisonous insects/worms) [*Cha. Sha. 1/121*].

Therefore, it is clear that, the term '*Bhuta*' means living beings in general. However, one cannot find specific clinical presentation or any classical disease in Ayurveda known to be caused by 'living being' arbitrarily. The possibility of evil spirits being the aetiological factor for current pandemic has been ruled out earlier. Therefore, we shifted our focus to the study of the other factor i.e. diseases caused by *Savishakrumi* (poisonous creatures/insects) as suggested by the use of term '*Bhuta*'.

#### **Savishakrumi (Poisonous creatures) and Keeta**

Classical Ayurveda treatises have described clinical features and management of toxicity induced by poisonous plants (*Sthavaravisha*) and animals (*Jangamavisha*) of varied types. *Charaka* has used the word '*Krumi*' (~insect/worm) while explaining the term '*Bhuta*'. Also, *Krumi* are included under

'*Jangama*' category by *Sushruta*.<sup>[14]</sup> Thus, we further focused on clinical features of toxicity caused by various groups of animals like snakes, scorpions, rodents, dogs, spiders and insects described in classical treatises.<sup>[15]</sup> When the signs and symptoms of various types of envenomation from these animals were studied, it was found that, clinical presentation of toxicity induced by *Keetavisha* shows similarity with clinical features of COVID-19 to large extent. The term *Keeta* indicates poisonous insects like scorpions, spider etc.<sup>[16-18]</sup> Therefore, further, we studied '*Keetavisha*' in depth to explore the possibility of finding similarity between natures of Covid-19 and '*Keetavisha*'.

#### **Types of Keetavisha and clinical features of toxicity**

*Charaka*,<sup>[17]</sup> *Sushruta*<sup>[18]</sup> and *Vagbhata*<sup>[19]</sup> have classified *Keeta* on the basis of criteria like nature of toxicity, *Dosha* dominance and fatality. Clinical characteristics of toxicity induced by these types have also been listed. We reviewed the clinical features of *Keetavisha* types described in Ayurveda and compared those with the clinical features of COVID-19 which has been presented in the Table No 1.

#### **Clinical features of Keetavisha toxicity and Covid-19**

Keeta Visha sign & symptom		COVID-19 Clinical features
Category / stage	Signs and symptoms	
Teekshna (Acute systemic symptoms)	<i>Jwara</i> <sup>[20]</sup> (~Fever)	Fever <sup>[21]</sup>
	<i>Angamarda</i> <sup>[20]</sup> (Generalized body ache/Myalgia)	Myalgia, fatigue <sup>[21]</sup>
	<i>Romancha</i> <sup>[20]</sup> (~Goosebumps/slight excitement/bristling)	NA
	<i>Chhardi</i> <sup>[20]</sup> (~Vomiting& Nausea)	Vomiting, <sup>[21]</sup> Nausea
	<i>Atisara</i> <sup>[20]</sup> (~Diarrhoea)	Diarrhoea <sup>[21]</sup>
	<i>Trishna</i> <sup>[20]</sup> (~Thirst)	NA

	<i>Daha</i> <sup>[20]</sup> (~Burning sensation)	NA
	<i>Moorchha</i> <sup>[20]</sup> (~syncope/attacks of swooning)	Shock <sup>[21]</sup> (reported as complication of COVID-19)
	<i>Vijrumbhika</i> <sup>[20]</sup> (~Yawning)	NA
	<i>Vepathu</i> <sup>[20]</sup> (~Shivering/Tremors)	NA
	<i>Shwasa</i> <sup>[20]</sup> (~Dyspnoea)	Dyspnoea <sup>[21]</sup>
	<i>Hikka</i> <sup>[20]</sup> (~Hiccough-Atypical presentation)	Hiccough - Atypical presentation <sup>[22]</sup>
	<i>Daruna Daha</i> <sup>[20]</sup> (~Intolerable burning sensation),	NA
	<i>Daruna Sheeta</i> <sup>[20]</sup> (~Chills)	Chills <sup>[23]</sup>
<b>Acute Local symptoms</b>	<i>Pidakopachaya</i> (~Manifestation of papules), <i>Shopha</i> (~Oedema), <i>Granthi</i> (~Nodular/Glandular swellings), <i>Mandalani</i> (~Circular lesion or rashes), <i>Dadru</i> (~Skin disease having circular patches), <i>Karnika</i> (~Thorny skin projections), <i>Visarpa</i> (~Spreading cellulitis/Erysipelas), <i>Kitibha</i> (~A type of skin disease categorized under <i>Kuṣṭha</i> with rough dry skin) <sup>[20]</sup>	These are local symptoms of insect bite. Hence not applicable in this context.
<b>Manda (Slow or mild Systemic symptoms)</b>	<i>Praseka</i> <sup>[20]</sup> (~excessive salivation)	NA
	<i>Arochaka</i> <sup>[20]</sup> (~Tastelessness/Anorexia)	Anorexia <sup>[21]</sup> , anosmia & dysgeusia <sup>[24]</sup>
	<i>Chhardi</i> <sup>[20]</sup> (~Vomiting)	Vomiting <sup>[21]</sup>
	<i>Shirogaurav</i> <sup>[20]</sup> (~Heaviness of head and headache)	Headache <sup>[21]</sup> Heaviness/tension headache <sup>[25]</sup>

	<i>Shitaka</i> <sup>[20]</sup> (~Chills)	Chills <sup>[23]</sup>
<b>Slow or mild Local symptoms</b>	<i>Pidaka</i> (~Papules or eruptions), <i>Kotha</i> (~Wheel like skin eruptions), <i>Kandu</i> (~Itching at the site of bite) <sup>[20]</sup>	These are local symptoms of insect bite. Hence not applicable in this context.
<b>According to the type of Visha</b>	Signs and symptoms relevant to that <i>dosha</i> dominance. <sup>[20]</sup> E.g <i>Kasa</i> can be considered as a sign of <i>Kantha</i> ( <i>Kaphasthana</i> ) specific symptom	Dry cough <sup>[21],[23]</sup>
<b>Dooshi Visha</b>	<i>Gatram Raktam, Sitam, Krushnam, Shyavam</i> (~Discolouration of affected body part), <i>Pidakanwitam</i> (~Development of papules/eruptions), <i>Kandu</i> (~Itching), <i>Daha</i> (~Burning sensation), <i>Visarpa</i> (~Spreading cellulitis/Erysipelas), <i>Sarpadashatavandansha Lakshana</i> (~Signs like snake bite). <sup>[17]</sup> [These represent the local symptoms of insect bite.]	The bite of a poisonous creature/microbe is not evident in COVID-19 invariably. However, few studies report skin manifestation like Mottled skin, petechial or purpuric rash in some cases <sup>[26]</sup> and such clinical presentation show similarity with local insect bite features described in <i>Keetavisha</i> .
<b>Pranahara</b>	<i>Akshigaurav</i> <sup>[17]</sup> (~heaviness of eyes)	NA
	<i>Moorchha</i> <sup>[17]</sup> (~Attacks of swooning or Syncope)	Pre-syncope or syncope <sup>[27]</sup>
	<i>Rugarta</i> <sup>[17]</sup> (~Sufferings due to pain),	NA
	<i>Swasiti</i> <sup>[17]</sup> (~Dyspnoea)	Dyspnoea <sup>[21]</sup>
	<i>Trishna</i> <sup>[17]</sup> (~Thirst),	NA
	<i>Aruchi</i> <sup>[17]</sup> (~Tastelessness/Anorexia)	Anorexia, <sup>[21]</sup> anosmia & dysgeusia <sup>[24]</sup>

It is observed that, most of the common signs, symptoms of COVID-19 are listed as clinical features of *Keeta Visha* toxicity as well. However, there are

also few features like dry cough, which is one commonly observed symptom in cases of COVID-19,<sup>[21]</sup> but is not explicitly mentioned under *Keeta Visha* toxicity. For such features, one guideline given by *Sushruta* can be helpful. *Sushruta* indicates that, apart from the listed symptoms of *Keeta Visha* toxicity, specific symptoms related to *Dosha*, specific to the type of *Keetavisha*, can also be observed.<sup>[20]</sup> Moreover, *Charaka* while describing the biological effects of *Visha* states that, the several other clinical features may also develop depending upon the location of *Visha*, *Doshas* and *Prakriti* of patient.<sup>[28]</sup> From the foregoing, it is thus understood that, the signs and symptoms of *Keeta Visha* show similarity with the clinical features of COVID-19 to large extent than any other poisoning by animate sources described in classical treatises.

In addition to the clinical features, it is observed that, some characteristic features of COVID-19 known to us by far, can also be explained in the light of Ayurveda by adopting *Keeta Visha* toxicity hypothesis. For instance, asymptomatic presentation in some of the infected people and on the other hand, grave prognosis or sudden death in some individuals.

#### Concept of *Dooshi Visha* and asymptomatic nature of COVID-19

It is estimated that, approximately 40% to 45% of those infected with SARS-CoV-2 remain asymptomatic.<sup>[29]</sup> In order to explain this characteristic presentation according to Ayurveda, one can consider the concept of *Dooshivisha*. Ayurveda treatises have expounded that, a poison (animate/inanimate/artificial) which has not been completely expelled out of the body and thus its residual part stays in the body for a long period and becomes less potent is called as *Dooshivisha*.<sup>[30]</sup> Or *Dooshivisha* is that less potent poison by nature which generates no symptoms unless stimulated by certain factors.<sup>[31]</sup> Since the potency of *Dooshivisha* is less, it does not show any immediate fatality nor do its symptoms arise right after its entry into the body. However, various factors are listed by Ayurveda treatises that lower the immunity of a person, reduce

the *Dhatubala* and lead to development of various signs and symptoms of toxicity in later part. This happens when the strength of *Dooshivisha* increases, which was already existing in body in dormant state. Therefore, asymptomatic nature of COVID-19 could be attributed to either low potency of causative factor like *Visha* that has entered into the body or, non-existence of certain host specific factors that could be playing crucial role in full fledged manifestation of *Visha*.<sup>[31]</sup>

#### Factors modifying action of *Visha* and severe presentation of Covid-19

On the similar lines, one can also understand according to Ayurveda, why in some cases COVID-19 leads to grave complications and ultimately death. Classics mention few factors which modify the action of poison in a human body or confluence of those lead to very bad prognosis. *Vagbhata* has called it '*Visha Sankata*'.<sup>[30]</sup> These factors when exist in addition to the presence of poisonous substance, add to the effect of poison and its biological effects. Thus, such individual develops severe effects of the toxicity as compared to others affected by the same poison and can also die if the specific targeted interventions are not employed timely. In addition to that, one can see that, while describing the effects of *Visha*, *Charaka* has clearly mentioned that *Visha*, owing to its attribute '*Teekshna*', has a potential to affect *Marmas* and thus leading to life threatening complications. It is also said that, '*Vikashi*' nature of *Visha* makes it fatal in nature (*Pranaghna*).<sup>[28]</sup> Therefore, this consideration offers a provision to comprehend the severe nature of this disease in some infected individuals, possibility of grave complication or even death in some infected individuals in this disease in the light of Ayurveda.

#### Modes of spread of *Visha* and transmission of Covid-19

In an attempt of understanding the transmission of the disease in the light of Ayurveda, modes of transmission of *Visha* were studied. While describing the properties of *Visha*, *Charaka* has stated that, because of the '*Vyavayi*' nature, *Visha* has a potential

to spread very quickly indicating its high transmissibility and quick progression of disease caused by it.<sup>[28]</sup> *Sushruta* has described transfer of *Visha* from inanimate objects to humans. He describes features of certain objects that are infected with *Visha*. Such objects are considered as potential sources for further transmission of poison to humans after contact.<sup>[32]</sup> Such type of contact transmission of '*Visha*' is labeled as '*Vishopasarga*' by *Sushruta*. *Sushruta* clearly mentions that not just the bite by insect but also intake or contact with particles of bodies of these insects may lead to toxicity.<sup>[31]</sup> Similarly, *Sushruta* has mentioned an example of *Vishakanya* (female who is poisonous to others who come in close contact with her) which is indicative of ability of human to human transmission of '*Visha*'.<sup>[32]</sup> Thus, all these examples further again support the possibility of '*Visha*' as a causative factor of COVID-19 since the transmission of a disease causing factor from one person to other and also through contact with infected surfaces could be observed in both these conditions.

## CONCLUSION

Thus, we conclude that, the nature of the disease developing in humans due to SARS-Cov-2 infection is comparable to the *Keeta Visha* toxicity. Further studies to establish plausible relationship between '*Visha*' and SARS-Cov-2 infection as well as to establish its utility in clinical management of COVID-19 are warranted which would provide direction to develop specific therapeutic intervention strategies to manage all stages of COVID-19 with Ayurveda.

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