



## Janapadodhwamsa in Ayurveda and its comparison with recent COVID-19 pandemic

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### ABSTRACT

Epidemics or outbreak is a sudden spread of the disease within a short time to a large number of people in a given population. Ayurveda is an ancient system of medicine, clearly mentioned about such diseases causing epidemic under a broad term 'Janapadodhwamsa'. There is no term as Epidemiology in Ayurveda, but the principles were described in piecemeal when compiled, analysed and interpreted the same as a modern theory of Epidemiology. Many of today's medical sciences coincide with some of the basic principles of Ayurveda. Today whole world is suffering from the COVID-19 pandemic. To assess the concepts of epidemiology in Ayurveda and to compare the same with recent COVID-19 pandemic. Literary study of the epidemic was done thoroughly, including classical treatises like Charak Samhita, Sushrut Samhita & modern textbooks of epidemiology. Most of the concepts of Ayurveda about Janapadodhwamsa are found relevant to current theories of pandemic/epidemic. When COVID-19 pandemic compares with Janapadodhwamsa, it shows similarity in concepts like aetiology, modes of transmission, principles of prevention of outbreaks etc. Also, control measures of COVID-19 can be compared with Hetu-viparit&Vyadhi-viparitchikitsa. The concepts described in Ayurveda regarding Janapadodhwamsa are more or like the present modern concept of the pandemic/epidemic. Thus, the ancient Indian medicinal systems were well known to the fact of the epidemics & outbreaks of infectious diseases.



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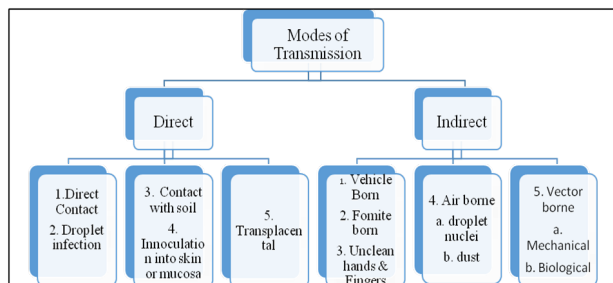
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### INTRODUCTION

Epidemics or outbreak is a sudden spread of the disease within a short period to a large number of people in a given population. According to Park textbook of preventive and social medicine, Epidemics (Epi = upon; demos = people) is an unusual occurrence in a community or region of disease, specific health-related behaviour or other health-related events clearly above average expectancy. The number of cases showing an outbreak depends on the agent, size and form of the population being exposed, prior experience or lack of disease exposure, and the time and place of occurrence. An out-

break that typically affects a large proportion of the population in a wide geographical area, such as part of a nation, whole nation or continent, is known as a pandemic. India comes across a variety of pandemics & epidemics like influenza, cholera, dengue, smallpox & many more. Many of them remain a threat to the community.



**Figure 1: Modes of transmission of disease**

Along with these communicable diseases which are compressed in times, many non-communicable diseases with a shifted epidemic time scale from several days or weeks to years are also included in epidemics (Swetha *et al.*, 2019). However, newly infectious diseases like COVID-19 are emerging day by day affecting humans & animal's lives & also having high costs to society. Several contributing factors like climate changes, globalisation, urbanisation, malnutrition, poverty, lack of sanitation, lack of a proper public health system and prolonged use of immune suppressant drugs, allow more natural transmission of viral diseases in the community (Lindahl and Grace, 2015; Rice *et al.*, 2000). Endemic or outbreak can occur when known & unknown environmental factors bring agent (pathogen) & host (population) together.

In Ayurveda, a concept similar to the epidemic is narrated by Acharya Charak under a broad heading 'Janapadodhwamsa'. The word 'Janapadodhwamsa' comprises of two words Janapada (large population) & Udhvamsa (destruction) which means the diseases affecting & causing damage of a large number of people. Factors which are familiar to the people under a particular community like air (Vayu), water (Jala), habitat (Desha) and seasons (Kala), Sinful acts (Adharma) in the form of war, affliction by attacks of monsters, demon, alliants (Rakshas) etc. & curses (Abhishap) are responsible for 'Janapadodhwamsa'. (Shukla *et al.*, 2019). All pandemic & epidemic diseases form the modern sciences are included under Ayurvedic 'Janapadodhwamsavyadhi'. Further, in Ayurveda, there is a concept of illnesses caused by causes, which cannot be controlled by human intelligence (DaivabalaPravrutavyadhi). It includes Contagious (Sarsargaja) & Infectious (Upsargaja) diseases which indi-

cate that certain conditions can be transferred directly from an infected person to a healthy person. In contrast, certain diseases get transmitted to a healthy person from close contact with an infected person (Goyal, 2019).

### Recent COVID-19 pandemic

India, a country having extreme geo-climatic diversity, is continually facing various emerging & re-emerging viral infections. Disease surveillance needs to be strengthened based on epidemiology & disease burden. Also, we need to know the details like disease bionics, vector biology, environmental factors influencing diseases etc. "One Health Approach" is one of the vital links for strengthening emergency preparedness & response of the illness (Mourya *et al.*, 2019). Recently COVID-19 infection emerged as pandemic across the world from its origin in Wuhan City of Hubei Province of China and spreading to near about 207 countries around the globe. As per the World Health Organization (WHO) report on dated 03<sup>rd</sup> April 2020 total confirmed cases of COVID - 19 are 9, 72,640 with 50,325 deaths worldwide (WHO, 2020). In India first case of the COVID-19 was detected in Kerala on 30<sup>th</sup> January 2020 and presently on dated 14<sup>th</sup> April 2020, total 11,487 cases were confirmed with 393 deaths (Sahu *et al.*, 2020).

Coronaviruses (Co-V) belong to the genus Coronavirus in the Coronaviridae. All Co-Vs are pleomorphic RNA viruses characteristically containing crown-shape peplomers with 80-160 nm in size and 27-32 kb positive polarity. Coronaviruses are zoonotic pathogens that are present in humans and various animals with a presentation from an asymptomatic course, to the requirement of hospitalisation in the intensive care unit; due to infections in respiratory, hepatic, gastrointestinal, and neurologic systems. Chinese authorities announced on 07th January 2020 that a novel type of Coronavirus (novel Coronavirus, nCo-V) was isolated. This virus was named as COVID-19 by WHO on 11th February 2020. (Sahin *et al.*, 2019)

According to current evidence, COVID-19 virus is primarily transmitted between peoples through respiratory droplets and contact routes. (Liu *et al.*, 2020) All ages are susceptible. Infection is spread by large droplets that are produced by symptomatic patients while coughing and sneezing but may also occur from asymptomatic people and before symptoms begin (Rothe *et al.*, 2020). These infected droplets will spread 1-2 m over surfaces and deposit. In favourable atmospheric conditions, the virus can remain viable on surfaces for days but is killed in less than a minute by specific disinfect-

tants such as sodium hypochlorite, hydrogen peroxide etc. (Kampf *et al.*, 2020). Infection is acquired by either inhaling these droplets or touching infected objects, and then touching the nose, mouth, and eyes. The virus is also present in the stool and water supply and hypothesises subsequent transmission through the aerosolisation / faecal-oral route (Hindson, 2020). There is no explanation of trans-placental transmission from pregnant women to their fetus, as per current knowledge. The neonatal disease is identified, however, due to post-natal transmission (Chen *et al.*, 2020b). The incubation time frame changes from 2 to 14 days [median 5 d]. Studies have distinguished angiotensin receptor 2 (ACE2) as the receptor through which the infection enters the respiratory mucosa (Cheng and Shan, 2020).

### Clinical Features of COVID-19

The clinical features of COVID-19 are varied, extending from asymptomatic to acute respiratory distress syndrome, and multi-organ dysfunction. The typical clinical highlights incorporate fever (not in all), cough, sore throat, headache, fatigue, headache, myalgia and breathlessness. Conjunctivitis has also been described. Thus, they are indistinguishable from other respiratory infections. In a subset of patients, by the end of the first week, the disease can progress to pneumonia, respiratory failure and death (Chen *et al.*, 2020a). The median time from symptom onset to dyspnoea was five days, seven days of hospitalisation and eight days of acute respiratory distress syndrome (ARDS). In the published series, the need for intensive care admission was present in 25–30% of affected patients. Witnessed complications included acute injury to the heart, ARDS, shock and severe kidney injury. Recovery began in wk 2nd or 3rd. In those who recovered the median duration of hospital stay was ten days. Adverse effects and death are more severe among older people and those with underlying comorbidities (50%–75% of fatal cases). The fatality rate ranged from 4 to 11% in hospitalised adult patients. The average fatality rate is estimated at 2 and 3%. (Worldometers, 2020).

### Aim & Objective

1. To learn about Janapadodhwamsain Ayurveda through a various literature search.
2. To compare this ancient Ayurvedic knowledge with the recent pandemic of COVID -19.

### MATERIALS AND METHODS

Literary study of Janapadodhwamsa thoroughly including classical treatises like CharakSamhita,

SushrutSamhita of Ayurveda was done. For contemporary review Standard textbooks of epidemiology were used for the study. Information is collected through WHO reports; pub-med, Scopus indexed journals. Approximate Modern terminology for the Ayurvedic terms was used according to CCIM, India.

### DISCUSSION

Ayurveda, an ancient Indian system of medicine is the science of the human civilisation. It deals with all aspects of life, including its adjoining environment. Akin to modern science, the ancient medical compendium also has several branches which described various theories, concepts, and principles with some of them having unique expertise. However, being specialised expertise, they also represent different other branches of Ayurveda. Father of Indian Surgery, Acharya Sushruta also describes other branches like pathology & medicine in his classical doctrine SushrutaSamhita along with surgery. Same is with Acharya Charak known as the father of Indian medicine. Ayurveda principally aims at prevention of body ailments maintain health rather than merely curing of symptoms or disease. Also, in modern medicine, holistic concept of health acquainted with the strength of social, economic, political and environmental influences on health. This view corresponds to the view held by the ancients that in a sound body, in a sound family, in a sound environment, health implies a sound mind. Thus, modern science also gives importance to the promotion & protection of health. However, not all but many concepts of Ayurveda can be compared with modern science which holds equal importance. Epidemiology is the branch of medical science which deals with the study of description & determinants of health-related status or events including diseases. Many diseases, along with its etiological factors & origin, are described in Ayurveda as of modern science. Some concepts of epidemiology can be compared with Ayurvedic concepts. In the present article, an attempt is made to study Janapadodhwamsa & compare this knowledge with the recent COVID-19 pandemic.

### Aetiology & mode of transmission of Epidemics

Hippocrates, a Greek physician, coined the term epidemic for diseases which used to occur during specific periods of a year or during certain years, (Kalra *et al.*, 2015) while aetiology deals with the study of causation & origination of disease. Also, origin & causative factors of various infectious diseases & epidemic are elaborated in Ayurvedic texts as Janapadodhwamsa. The term Janapadodhwamsa comprises of two words Janapada (community) & Upad-

hwansa (destruction). In Ayurveda, causes responsible for disease production include mainly Individual factors (Asadharanhetu) & factors relating to the community (sadharanhetu). Chakrapani, an annotator of CharakSamhita, describes the causative factors of diseases & epidemic. Even though every individual defers with others in their physical constitution, food habits, body built, strength, age, immunity etc. they get affected with diseases due so common factors belong to that community. These factors lead to the simultaneous manifestation of illness having the same set of symptoms among all the inhabitants leading to widespread manifestation in the society. Deranged air (Vayu), water (Jala), habitat (Desha) and seasons (Kala) are those common factors of all individuals in a community responsible for diseases which causes mass destruction of people (Jyotirmoy and Rekha, 2016).

Along with that some other factors described by Acharya Charaka as unavoidable factors (Niyathetu) like abnormalities of star, moon, planets, sun, air & fire causing natural disasters like floods, earthquakes, tsunami etc. and avoidable factors (Aniyathetu) like Sinful acts (Adharma) in the form of war (Shastraprabhav), affliction by attacks of demons or germs (rakshsas), & curses (Abhishap) are responsible for Janapadodhwamsa. The root cause for vitiation of air, water etc. is immorality (Adharma) or misdeeds of past performed by intellectual errors (Prajnaparadha). (Samal, 2016)

In the present day, sinful acts can be correlated to different activities like anti-national elements indulging in bomb blasts, terrorism, crime, deforestation, not obeying government rules etc. Discharging of untreated polluted water into the river & automobile pollution produces water & air pollution respectively. Disposal of wastewater in an improper method on land leads to contamination of soil. The underlying cause, as mentioned earlier, is intellectual errors (Prajnaparadha) due to rajas & tamas (mental factors) predominance resulting in greed, selfishness, tendency to harm people, jealousy & anger. All these factors do not influence the individual but also the society leading to Janapadodhwamsa.

Acharya Sushruta has described mode of transmission of communicable diseases in his classical text SushrutSamhita. According to him the Sexual contact (Prasangat), physical contact (Gatrasansparshat), Expired air (Nishvasat) or inhalation of droplets from an infected person, eating in the same plate with others (Sahabhojanat), sharing bed & seats (Sahashayyanat), using clothes, garlands & utensils used by infected persons (Vastramalyan-

ulepanat) all are responsible for the transmission of disease from infected to non-infected one. The similar concept given in modern sciences is described in Figure 1 which denotes that direct mode of transmission according to modern science synonymous with Prasangat, Gatrasansparshat, Nishvasat, Sahabhojanat, Sahashayyanat & Vastramalyanulepanat given by Acharya Sushruta. Also, vector-borne/vehicle-borne diseases show similarity with Sahashayyanat & Vastramalyanulepanat.

Inhalation of droplets from an infected person by a healthy person, travelling of an infected patient from one place to another, seasonal changes allow more natural transmission of SARS-CoV-2 virus responsible for this disease. Considering the above things vitiated air (Vayu), habitat (Desha) and seasons (Kala), affliction by attacks of germs (rakshsas) are considered as an etiological factor for COVID-19 pandemic. While Aniyathetu like a mistake of intellect as terrorism, accidents are compared with the spread of COVID-19 pandemic from the Wuhan city of China to about 208 countries worldwide. Also, according to the Sushrut Samhita, expired air or inhalation of a droplet from an infected person (Nishvasat), eating in the same plate with others (sahabhojanat), sharing beds (Sahashayyanat), using clothes, garlands & utensils used by an infected person (vastramalyanulepanat) can be considered as the mode of transmission of COVID-19 pandemics. Also, government & health system is making various efforts to resist the spread of diseases in the form of lockdown, preventing social gathering, prohibition on travelling etc. & advising to stay at home. But after repeated instructions given by the government, many peoples are contravening the rules & regulation. They are creating social violence by misdoing acts such as not providing proper travelling history to health care providers, not maintaining social distancing, assaulting doctors etc. This is nothing but the intellectual errors (Prajnaparadha) according to Ayurveda which is responsible for rising & spread of COVID - 19 pandemics. This showed that the ancient Ayurveda was well aware regarding the aetiology of the pandemics & epidemics with their mode of transmission. It also showed that ancient Indian medicinal pathy was well aware regarding the communicable disease with their mode of transfer, the season of transfer and is more or less still comparable with the recent COVID-19 pandemic.

### **Nature / Clinical features of Epidemics**

As said earlier that etiological factors are common to the population under a particular community, the disease produced due to these factors also has a

similar set of symptoms. These factors are different according to habitat, seasons, type of sinful acts etc. therefore, the particular disease is not mentioned in Ayurveda as a Janapadodhwamsavyadhi. The common etiological factors producing a similar set of symptoms, responsible for mass destruction of people should be considered as an etiological factor for widespread manifestation of that disease. According to Acharya Sushruta, all these modes of transmission causes genesis of certain infectious diseases which show the presentation of skin diseases (Kushta), Fever (Jwara), Pulmonary Tuberculosis (Shosha), Conjunctivitis (Netrabhishyanda) etc. As described in the introductory part of this article, the clinical features of COVID-19 are varied, ranging from asymptomatic to acute respiratory distress syndrome and multi-organ dysfunction. Common clinical symptoms include fever (not all), cough, sore throat, headache, exhaustion, anxiety, myalgia, and breathlessness. Conjunctivitis has also been described. Thus, the clinical feature of COVID-19 can be compared with Jwara, Shosha & netrabhishyanda.

### Control & treatment of Epidemics

The treatment of epidemic aims at both preventive & curative measures. Preventive measures help to minimise the occurrence of emerging disease & limit the hazardous effects of causative factors while corrective actions help to treat the condition properly.

For the management of epidemics, specific preventive measures are described in Ayurveda are as follows

1. Collection of potent medicinal drugs before the outbreak of an epidemic.
2. Avoid sinful acts & intellectual errors.
3. Rejuvenation therapy (RasayanaChikitsa) to enhance the immunity and strength of the body.
4. Truthfulness, compassion for living being, charity, generosity, worshipping god, tranquillity, Codes of conduct, protection of the self by mantras & auspicious rituals help to prevent the disease.
5. Search for the things which are suitable for the person, residence in auspicious localities, discussion of religious scriptures.
6. Avoid pollution of air, water, food or environment. (Shukla *et al.*, 2019)

Ayurveda also described control of epidemics by using treatment opposite of etiological factors (Hetuviparitchikitsa) and treatment opposite of disease (Vyadhiviparitchikitsa).

### 1. Treatment opposite of etiological factors

#### Purification of Air (Vayu)

Purification of air is done by fumigation (Dhoopan). For fumigation certain medicinal plants having microbial potential like Ativisha (Aconitum heterophyllum), Musta (Cyperusrotundus), Ushir (Vetiveriazanioides), Kushta (SaussureaLappa), Priyangu (Callicarpamacrophylla), Tagar (Valerianawallichii) Neem (AzadirachtaIndica), Tulsi (Ocimum sanctum), Haridra (Curcuma loga), Vacha (Acoruscalamus), Deodara (Cedrusdeodara), Vidanga (Embelicaribes) etc. are used. Fumigation is used to disinfect the clothes, bed sheets, surrounding atmosphere etc. It acts as a disinfectant and helps to prevent infectious diseases.

#### Purification of Water (Jala)

Use of water contaminated with urine, stool, insects, leaves, decomposed material, ova/eggs, etc., having bad taste & smell is strictly prohibited in Ayurveda. Before using such water, it gets purified first. Highly contaminated water is used after boiling. If it is slightly contaminated then, it is purified by quenching hot iron rod or by exposure to sun rays. Nirmaliis recommended as a water purifier in Ayurveda. Some wormicidal (krumighna) & diuretic (mutral) drugs like Vidang (Embelicaribes), Musta (Cyperusrotundus), Dhanyak (Coriandrum sativum) etc. are used to remove the toxins from the body.

#### Rasayan (Rejuvenation) and Shodhan (detoxification) treatment

Rasayana Chikitsa (Rejuvenation therapy) according to Ayurveda nourishes, develops & corrects the vitiated body elements. It is used to improve immunity & build the strength of the body. While detoxification of the body is done by Panchakarma treatment. It helps to remove toxic and infectious substances from the body without causing any side effects.

Above discussion showed that epidemic or pandemic or outbreaks could be controlled by hetuviparitchikitsa & Vyadhiviparitchikitsa. When compared with COVID-19 pandemic, the control measures taken consist of the purification of air, places, and things in & around the case of COVID-19 with the help of pure disinfectant like sodium hypochlorite & this can be compared with the hetuviparitchikitsa in ancient Ayurveda. Also, the treatment of the COVID-19 consists of symptomatic & supportive treatment. The treatment of the cases is done with the help of drugs like paracetamol, hydroxychloroquine, azithromycin etc. which can be compared with Vyadhiviparitchikitsa of the ancient Ayurveda. Again Ayurveda had a concept of RasayanaChikitsa which means boosting of the immunity which can be compared with modern immunisation/Vaccination concept to increase the immunity of person towards

the particular disease agent. Vigorous efforts are going on worldwide for the preparation of the vaccine for recent emerging viral disease COVID-19. In the prevention & control of the COVID-19 pandemic, isolation & quarantine plays an important role where infected persons with or without symptoms are kept away from the non-infected people of the community to halt the spread of infectious viruses to the other part of the community.

## CONCLUSIONS

The concepts described in Ayurveda and contemporary era are more likely corresponding to each other, and we cannot neglect their significance. The causes of epidemic & outbreak mentioned in Ayurveda shows very much similarity with modern epidemiological concepts and theories of pandemic, epidemic & outbreak of various diseases. Modes of transmission of infectious disease-causing epidemic described by Acharya Sushruta are very much relevant to as described in modern science. The preventive & control measures of both science-related firstly with prevention. When compared with the recent pandemic of COVID-19, we found that vitiated air (Vayu), habitat (Desha) and seasons (Kala), affliction by attacks of germs (rakshsas) are considered as etiological factors for COVID – 19 pandemics. Also, as per Sushrut Samhita, expired air or inhalation of a droplet from an infected person (Nishvasat), eating in the same plate with others (sahabhojanat), sharing beds (Sahashayasanat), using clothes, garlands & utensils used by an infected person (vastramalyanulepanat) can be considered as the mode of transmission of COVID-19 pandemics.

In contrast, the control & treatment for the recent COVID-19 pandemic can be found as hetuviparitchikitsa & Vyadhiviparitchikitsain the ancient Ayurveda. Thus, we can conclude that in-depth analysis of the concepts of Ayurveda can provide light over aetiology, mode of transmission, control, preventive & treatment of many pandemics, epidemic & outbreak modern medical sciences in the present era. Also, scholars from ancient Ayurveda medicine had medicinal knowledge far ahead of their time which is still comparable with many relevant concepts of modern medicinal sciences.

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## Conflict of Interest

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