All Kerala Govt. Ayurveda College Teacher's Association
KERALA JOURNAL OF AYURVEDA
An International Journal of Ayurveda Specialties

ISSN 2583-8555 (ONLINE)
Vol 3(3): 23-27 (2024)
https://doi.org/10.55718/kja.305

ORIGINAL ARTICLE

Status of *ojus* in post-COVID subjects of different *dosha prakriti* - An observational study

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ARTICLE HISTORY

Received: 27 July 2024
Accepted: 19 September 2024

Available online
Version 1.0 : 31 September 2024

Keywords

Coronavirus; COVID-19, *Ojus, Ojokshaya, Prakriti*

Additional information

Peer review: Publisher thanks Sectional Editor and the other anonymous reviewers for their contribution to the peer review of this work.

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CITE THIS ARTICLE

Arya AR, Ajitha K, Ananda LKN, Sivaram A, Panthappulan H, Pradeep K. Status of *ojus* in post-COVID subjects of different *dosha prakriti* - An observational study. Kerala Journal of Ayurveda. 2024; 3(3): 23-27. https://doi.org/10.55718/kja.305

Abstract

The novel Coronavirus outbreak was declared as a public health emergency of international concern (PHEIC), the highest alarm level by WHO on 30th January 2020. As of July 2021, more than 18 crore cases have been reported all over the world and the death toll has risen to more than 40 lakhs. After the recovery period also, the patients suffered from several symptoms and complications known as post-COVID syndrome. *Ojus* is the essence of all seven *dhatus* responsible for the body's strength and maintenance. *Ojus* plays an important role in consciousness, positivity, longevity, intelligence & memory. Fatigue is an *ojokshaya lakshana* which is a main symptom experienced by post-COVID individuals. *Prakriti* is a unique concept in Ayurveda that is inherent in the individual from conception to death. The concept of *prakriti* in Ayurveda stands as one of the most widely accepted & applied principles. Analysis of *prakriti* must be done to understand the anatomical, physiological and psychological constitution of the body. This paper assesses the status of *ojus* and *prakriti* in post-COVID subjects. The paper study follows an observational design with a sample size of 71 participants. The status of *ojus* was assessed using the tool developed by Dr Amrutha Elamon for the clinical evaluation of the status of ojus. *Prakriti* assessment questionnaire from the book 'A Working Model for Diagnosis in Ayurveda' by Dr. P.M Madhu was utilized for the assessment of *prakriti*. The results indicated a significant change of *ojus* among the subjects with *vatapitha, pithakapha* and *tridoshaja prakriti.*

Introduction

Coronaviruses are a broad group of viruses that can cause illnesses ranging from fever to severe diseases such as middle east respiratory syndrome and severe acute respiratory syndrome. The viruses belong to the Nidovirales order and are enveloped single-stranded positive-strand RNA viruses.[1] On January 30, 2020, the World Health Organization raised the alert level to the highest possible by designating the new coronavirus epidemic as a Public Health Emergency of

International Concern (PHEIC). By July 2021, there had been more than 180 million cases reported worldwide with the death toll exceeding 4 million.[2] The most common symptoms in COVID-19 patients include: Fever 81.2% ; Cough: 58.5% ; Fatigue 38.5% ; Dyspnea: 26.1% ; and the Sputum: 25.8% .[3]

After recovery from the disease, many people suffer from several symptoms for a week or month. This condition is commonly known as Post COVID/ Long COVID/ Long Haulers.[4] Merely 10.8% of people had no symptoms after getting well from the sickness, while many had different ailments. The most commonly reported symptom was fatigue (72.8%), while more severe manifestations such as stroke, renal failure, myocarditis and pulmonary fibrosis were observed in a small percentage of subjects. The intensity of post-COVID-19 symptoms was found to be correlated with the severity of COVID-19.[5]

The pandemic and epidemic outbreaks are well known to ancient ayurvedic scholars since these are caused due to the large spread of communicable diseases and exist from the beginning of mankind. These are clearly explained in *charaka samhita* as *janapadodwamsa rogas* which results in demise of a significant portion of the population.[6] By comparing COVID-19 to *janapadodwamsa rogas*, one can treat patients with Ayurvedic medicine and prevent the spread of the disease.[7] It can also be considered under *sankramika roga* where disease transmission happens through contaminated things.[8] Given that COVID-19 spreads through viruses, it falls under the category of *aupasargika vyadhi*, which denotes communicable diseases. It can also be considered as *anukta vyadhi. Anukta* is a valuable tool for understanding new diseases, drugs and treatments. Ayurveda also has a concept of *agantuja vyadhi* (exogenous diseases) and the term *agantuja vyadhi* is implied for all diseases that may be due to external trauma or organisms such as parasites, viruses, bacteria, fungi, etc. So COVID-19 can be treated as *agantuja vyadhi* as this is a viral infection. The pathology of COVID-19 is primarily that of *sannipata jwara.* Abnormal immune responses in COVID-19 are the result of abnormalities of *tridosha, rakta* (blood) and *ojus* (vital nectar).[9]

According to Ayurveda, the *ojus* is the essence of all seven *dhatu*s (tissues) ranging from *rasa* to *sukra* and acts as *bala* (immunity) of the body.[10] It is responsible for the strength and maintenance of the body. It also plays an important role in consciousness, positivity, longevity, intelligence, and memory. Exhaustion, fatigue, loss of intelligence, body heaviness and even mortality can occur due to impairment of the *ojus.*[11] Fatigue which is an *ojakshaya lakshana* is the main symptom experienced by post-COVID individuals. The severity of these diseases varies individually.

The concept of *prakriti* in Ayurveda stands as one of the most widely accepted and applied principles. Uniqueness characterizes each individual in the world, evident through disparities in physical, physiological and psychological dimensions. *Prakriti* is inherent in the individual from conception to death and is distinct since fertilization, mediated by maternal and paternal traits.[12]

Aim and objective

- To assess the status of *ojus* in post-COVID individuals of different dosha prakriti.

Methods

The subjects were taken from the Kasaragod and Kannur Districts. The lists of COVID-19 patients were collected from the COVID control cell, DMOH (District Medical Office Health) Kasaragod district and Government Medical College Kannur.

The present study was an observational type of study. Due COVID-19 pandemic situation, utmost care was taken to adhere to the safety precautions instructed by the authorities. The subjects of the study were post-COVID individuals. The preliminary data and detailed medical history were filled in first which was followed by the assessment of *ojus* and *prakriti*. The study was carried out in two phases. The first assessment was carried out on the seventeenth day after the participant became COVID-positive. The second assessment was carried out one month after the first assessment (47th day).

Ethical clearance

Consent was taken from the institutional ethical committee and the study was approved with reference E2/2059/2020/ ACK/PG-2. Consent for the data collection was taken from the COVID Control cell, DMOH Kasaragod & Kannur Districts. Informed consent was taken from the participants and confidentiality was maintained throughout the study.

Inclusion Criteria

- Post COVID 19 individuals
- Males and Females
- Age: 20 to 70 years
- Those who provide informed consent

Exclusion criteria

- Pregnant and lactating women
- Subjects with a history of mental illness
- Subjects in the terminal stage of illness
- Diabetic Patients

Observation and Analysis

The current study had a total of 71 subjects out of which 4 (5.5%) subjects belonged to the age group 51-60 years, 5 (7%) subjects were of the age group 41-50, 3 (4.2%) subjects belonged to 31-40 years of age group and 59 (83.1%) subjects belonged to the age group 20-30. The lowest age recorded was 20 years and the highest was 59 years. Of the 71 subjects, 16 (22.5%) were males and 55 (77.5%) were females. Out of the 71 participants, 47 (66.2%) were from rural and 24 (33.8%) were from urban population. After assessing the *prakriti* of the 71 subjects, most participants were *pithakapha prakriti* and *vatapitha prakriti*.

Preliminary analysis of *ojus in* different *dehaprakriti*

The *Prakriti* of the individual is assessed by using the short questionnaire for *Deha Prakriti* assessment taken from the book 'A working model for Diagnosis in Ayurveda'. It is a self -assessment questionnaire for assessing the *Prakriti* of the individual. This questionnaire contains 17 questions. Each question has three options. First option represents *Vata*, second one *Pitha*, and the third option represents *Kapha Prakriti*. One score was assigned to each question.

The tool to assess the status of *ojus* was developed as a part of research work in the *Kriyashareera* Department of Govt. Ayurveda College Kannur by Dr Amrutha Elamon. The tool was developed in the form of a structured close-ended questionnaire. The questionnaire has 37 questions. The mean, median, variance and standard deviation of *ojus* during the 1st assessment was calculated and the corresponding values were 45.04, 45, 146.012 and 12.084 respectively. The maximum score that can be obtained by a participant was 69 and the average attained by the participants was 45.04. The mean, median, variance and standard deviation of *ojus* during the 2nd assessment was calculated and the corresponding values were 52.89, 54, 108.273 and 10.405 respectively. The maximum score that can be obtained by a participant was 72 and the average attained by the participant was 52.89.

During the first assessment, 8 participants had *avara ojus*, 53 participants had *madyama ojus* and 10 participants had *pravara ojus.* During the second assessment, 2 participants had *avara ojus* 49 participants had *madyama ojus* and 20 had *pravara ojus.*

The status of *ojus* in post-COVID subjects of different *dosha prakriti.*

From the analysis, it was found that there is no significant difference between *ojus* in 1st & 2nd assessments for *vata prakriti*, *pitha prakriti*, *kapha prakriti* and *vatakapha prakriti*. A statistically significant result of *ojus* for 1st and 2nd assessment were found in *vatapitha prakriti*, *pithakapha prakriti* and *tridosha prakriti* and that results are shown below.

1. Status of *ojus* in *Vata- Pitha Prakriti*

Table 1: Result of Wilcoxon Sign Rank Test to assess status of *ojus* in *Vata-Pitha Prakriti*

		N	Mean Rank	Sum of Ranks
ojus _2 - *ojus* _1	Negative Ranks	1[a]	2	2
	Positive Ranks	17[b]	9.94	169
	Ties	3[c]		
	Total	21		

a. *ojus* _2 < *ojus* _1
b. *ojus* _2 > *ojus* _1
c. *ojus* _2 = *ojus* _1

Table 2 : Test Statistics of Wilcoxon Sign Rank Test to assess status of *ojus* in *Vata-Pitta Prakriti*

	ojus _2 - *ojus* _1
Z	-3.638[b]
Asymp. Sig. (2-tailed)	0

b. Based on negative ranks.

From the above table it can be interpreted that there is a significant difference between 1st and 2nd assessment of *ojus* for *Vata Pitha Prakriti*. Only 1 participant had a higher *ojus* during the first stage of COVID than *ojus* during the second stage of COVID. However, 17 participants have higher *ojus* during the second stage of COVID. Only 3 participants showed no change in their *ojus*.

2. Status of *ojus* in *Pitha- Kapha Prakriti*

Table 3: Result of Wilcoxon Sign Rank Test to assess status of *ojus* in *Pitha-Kapha Prakriti*

		N	Mean Rank	Sum of Ranks
ojus _2 - *ojus* _1	Negative Ranks	3[a]	4.67	14
	Positive Ranks	19[b]	12.58	239
	Ties	5[c]		
	Total	27		

a. *ojus* _2 < *ojus* _1
b. *ojus* _2 > *ojus* _1
c. *ojus* _2 = *ojus* _1

Table 4 : Test Statistics of Wilcoxon Sign Rank Test to assess status of *ojus* in *Pitha-Kapha Prakriti*

	ojus _2 - *ojus* _1
Z	-3.655[b]
Asymp. Sig. (2-tailed)	0

b. Based on negative ranks.

From the above table it can be interpreted that there is a significant difference between 1st and 2nd assessment of *ojus* for *Pitha Kapha Prakriti*. 3 participants had a higher *ojus* during the first stage of COVID than *ojus* during the second stage of COVID. However, 19 participants have higher *ojus* during the second stage of COVID. 5 participants showed no change in their *ojus*.

3. Status of *ojus* in *Tridosha Prakriti*

Table 5 : Result of Wilcoxon Sign Rank Test to assess status of *ojus* in *Tridoshaja Prakriti*

		N	Mean Rank	Sum of Ranks
ojus _2 - *ojus* _1	Negative Ranks	0[a]	0	0
	Positive Ranks	8[b]	4.5	36
	Ties	1[c]		
	Total	9		

a. *ojus* _2 < *ojus* _1
b. *ojus* _2 > *ojus* _1
c. *ojus* _2 = *ojus* _1

Table 6 : Test Statistics of Wilcoxon Sign Rank Test to assess status of *ojus* in *Tridoshaja Prakriti*

	ojus _2 - *ojus* _1
Z	-2.524[b]
Asymp. Sig. (2-tailed)	0.012

b. Based on negative ranks.

From the above table, we can interpret that there is a significant difference between 1st and 2nd assessment of *ojus* for *Tridoshaja Prakriti*. No participants had a higher *ojus* during the first stage of COVID-19 than *ojus* during the second stage of COVID-19. However, 8 participants have higher *ojus* during the second stage of COVID. Only 1 participant showed no change in their *ojus*.

Discussion

After assessing the *prakriti* of the 71 participants, most of the participants were *pithakapha prakriti* and *vatapitha prakriti*. These findings are at par with a previous study conducted by Rajan S et al. titled "*Prakriti* Analysis of COVID-19 Patients: An Observational Study", which analyzed *prakriti* of COVID-19 patients whose findings indicated that the individuals with *vatapitha prakriti* and *pithakapha prakriti* are more prone to COVID-19 disease.[13]

In the initial assessment, 8 participants had *avara ojus*, 53 had *madyama ojus*, and 10 had *pravara ojus*. In the second assessment, the number of participants with avara ojus came down to 2 individuals and the number of participants with *madyama ojus* decreased to 49 individuals, where as number of participants with *pravara ojus* increased to 20 individuals. The reduction in *avara* and *madyama* ojus participants and the increase in *pravara ojus* participants suggest an improvement in the overall status of ojus in the second assessment.

A Wilcoxon signed-rank test was conducted to assess *ojus* changes among different *prakritis*. In participants with *vatapitha prakriti,* a significant improvement in *ojus* was observed, with 17 participants showing enhancement, 3 participants experiencing no change and 1 participant having diminution of *ojus.*

For participants with *pithakapha prakriti*, a significant *ojus* change occurred, with 19 participants improving, 5 participants remaining unchanged and 3 participants having negative change in *ojus* compared to their initial assessment.

In *tridoshaja prakriti*, a significant level of *ojus* change was noted, with 8 participants improving and 1 participant experiencing no change, while no participants showed a decrease in *ojus*.

The finding of the study indicates that a significant improvement in *ojus* can be seen in the majority of the participants belonging to *vatapitha*, *pithakapha* and *tridoshaja prakriti*. *Pitha* is the common element in all these *prakritis*. Hence, *pitha* could be a factor in the improvement of *ojus* as it can influence the general status of *agni.*

According to Acharya Susruta, there is no existence of any other *agni* in the body without *pitha.*[14] Acharya Marichi has also emphasized that the *agni* present in the *pitha* gives good or bad results when it is normal or vitiated.[15] Chakrapani has commented on "*Pithantargatta*" that the function of *pitha* inside the body is not combustion but its work is to provide heat of *agni*. Besides this, Acharya Susruta has described five types of *agni*s as the varieties of *pitha*. Acharya Bhoja also considered *pitha* as *agni*, digestive fire is included within *agni*, which is specially meant for different enzymatic activities of the body, i.e. *pachana, deepana, bhedana*, etc.[16] According to Hemadri, *Pitha* is of five divisions, which are located in the interior of the *pakvashaya* and *amashaya*, although it is composed of *panchabhutas*. Because of an increase of *tejas bhuta*, it is devoid of liquidity (although it is a

liquid). Also, because it does not possess *snigdha* (viscidity), *sita* and such other properties of *apa bhuta*, it is called by the term "Anal" because of its function of *paka*. It cooks the food, dividing it into essence and waste separately. Being localized there, it bestows grace (help) to the other *pitha* present there and also the other *dhatwagni* present in the *Dhatus* by giving them strength (power of functioning), which is known as "*Pachaka Pitha*".[17] According to Acharya Sarngadara*, pitha* and *kapha doshas* are considered as lame without the support of *vata*.[18] Due to the *yogavahitwa* nature of *vata*, when it comes in accordance with *pitha dosha* it enhances the activity of *pitha dosha*. Finally results in the improvement of status of *agni*. So, it in turn causes better performance of *dhatwagni* which results in the successive *dhatu* formation and thereby enhancing *ojus*. However, in the current study individuals with *Pitha Prakriti* were not having a significant change in *ojus*. This could be due to the lower sample size of individuals with *pitha prakriti*.

Conclusion

Most participants in this study belonged to the *pithakapha prakriti* and *vatapitha prakriti.* A significant change in *Ojus* was found during the second assessment among subjects with *VataPitha, PithaKapha* and *Tridoshaja Prakriti.* The representation of different age groups was uneven since the study subjects were recruited consecutively and the hospitalized patients, for whom the severity of infection was high, could not be enrolled and hence are the limitations.

Limitations

- Representation of different age groups was uneven since the study subjects were recruited consecutively.
- Hospitalized patients, in whom severity of infection was high, could not be enrolled in the study

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