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EFFECTIVENESS OF VIDHIVAT RASAYANA UPAYOGA WITH HARITAKI CHURNA AND RASAYANA CHURNA VATI IN THE MANAGEMENT OF POST-COVID SYNDROME: AN EXPLORATORY COMPARATIVE CLINICAL STUDY

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ABSTRACT:
Background: Post-COVID syndrome may be associated with persistent manifestations such as joint pain, fatigue, muscular pain and intermittent fever. The present study evaluated the clinical effectiveness of Vidhivat Rasayana Upayoga using Haritaki Churna followed by Rasayana Churna Vati in comparison with Rasayana Churna Vati alone. The clinical study was designed as an open-label, randomized, exploratory interventional trial.
Objective: To comparatively evaluate the effectiveness of Vidhivat Rasayana Upayoga with Haritaki Churna followed by Rasayana Churna Vati and Rasayana Churna Vati alone in the management of post-COVID clinical manifestations. **Methods:** A total of 60 participants with persistent post-COVID manifestations were included and allocated into two groups of 30 participants each. Group A received Rasayana Churna Vati (5 tablets once daily on an empty stomach with lukewarm water), while Group B received Haritaki Churna (3–5 g once daily) followed by Rasayana Churna Vati. The intervention period was 30 days, followed by assessment at 60 and 90 days. Clinical outcomes included joint pain, fatigue, muscular pain and fever.
Results: Both groups demonstrated statistically significant improvement in joint pain, fatigue, muscular pain and fever after treatment. In Group A, significant improvement was observed across the four assessment points for joint pain, fatigue and fever ($p < 0.001$), with major improvement occurring during the initial treatment phase and being maintained during follow-up. Group B also demonstrated significant improvement in the assessed clinical parameters, including joint pain and fatigue ($p < 0.001$). On comparative analysis after treatment, Group B showed significantly betteimprovement than Group A for joint pain ($p = 0.034$), fatigue ($p = 0.022$), muscular pain ($p = 0.012$) and fever ($p = 0.021$).
Conclusion: Both interventions were effective in reducing the major clinical manifestations of post-COVID syndrome. However, the combination of Haritaki Churna followed by Rasayana Churna Vati, representing Vidhivat Rasayana Upayoga, demonstrated comparatively better clinical outcomes than Rasayana Churna Vati alone. The findings support the therapeutic potential of an appropriately sequenced Rasayana intervention in the management of post-COVID manifestations.

KEYWORDS: Vidhivat Rasayana Upayoga; Haritaki Churna; Rasayana Churna Vati; Post-COVID Syndrome; Rasayana; Clinical Study.

INTRODUCTION

The global community has experienced a major health crisis in the form of COVID-19, caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). The infection rapidly progressed from a regional outbreak to a worldwide pandemic and affected multiple organ systems, including the respiratory tract, liver, gastrointestinal system and nervous system. The prolonged impact of the pandemic also highlighted the need for appropriate approaches to recovery after the acute phase of infection.[REFERENCES:

Rastogi, S., Pandey, D. N., & Singh, R. H. (2020). COVID-19 pandemic: A pragmatic plan for Ayurveda intervention. Journal of Ayurveda and Integrative Medicine.]

Post-Acute COVID-19 is characterized by the persistence or emergence of symptoms beyond 3–4 weeks following the initial infection. Symptoms persisting from 4 to 12 weeks are described as sub-acute or ongoing symptomatic COVID-19, whereas manifestations continuing beyond 12 weeks are described as chronic or Post-COVID-19 syndrome. Persistent fatigue, joint pain, muscle pain and intermittent fever are among the general manifestations reported in the post-COVID phase.[Nalbandian, A., Sehgal, K., Wan, E. Y., et al. (2021). Post-acute COVID-19 syndrome. Nature Medicine, 27, 601–615.]

Post-COVID-19 may involve multiple systems and can present with respiratory symptoms such as dyspnoea and chronic cough, neuropsychiatric manifestations including anxiety, depression and sleep disturbances, cardiovascular symptoms such as chest pain and palpitations, gastrointestinal complaints and dermatological manifestations. These persistent effects may also result in a noticeable decline in quality of life and indicate the need for continued management, rehabilitation and monitoring.[Nalbandian, A., Sehgal, K., Wan, E. Y., et al. (2021). Post-acute COVID-19 syndrome. Nature Medicine, 27, 601–615.]

The importance of both cellular and humoral immune responses in SARS-CoV-2 has also been highlighted in immunoinformatics-based vaccine research, in which CTL, HTL and B-cell epitopes were evaluated as potential determinants of antiviral immune responses.[Srivastava, S., Verma, S., Kamthania, M., Kaur, R., Badyal, R. K., Saxena, A. K., Shin, H., Kolbe, M., & Pandey, K. C. (2020). Structural basis for designing multiepitope vaccines against COVID-19 infection: in Silico vaccine design and validation. JMIR Bioinformatics and Biotechnology, 1(1), e19371. https://doi.org/10.2196/19371]

Ayurveda describes widespread epidemic conditions under the concept of Janapadodhwamsa. The term refers to widespread affliction and destruction of communities on a mass scale. Ayurvedic literature describes disturbances involving Vayu, Jala, Desha and Kala among the factors associated with such widespread disease conditions. The thesis considers conceptual similarities between Janapadodhwamsa and the COVID-19 pandemic in relation to widespread disease, transmission and preventive measures.[Thakare, S. H., & Jumade, P. P. (2020). Janapadodhwamsa in Ayurveda and its comparison with the recent COVID-19 pandemic. International Journal of Research in Pharmaceutical Sciences, 11(Special Issue 1), 102–106.]

Rasayana Chikitsa is described in Ayurveda as a specialized approach concerned with rejuvenation and restoration. In the post-COVID-19 phase, the thesis relates persistent weakness and impaired recovery with Dhatu Kshaya and Agnimandya. Rasayana therapy is discussed in relation to restoration of tissue strength and nourishment, improvement of metabolic strength, enhancement of resistance and management of manifestations such as fatigue, weakness, respiratory distress and mental disturbances.[Agnivesha. (2011). Charaka Samhita (Yadavji Trikamji, Ed.; Chakrapani Datta, Ayurveda Deepika commentary). Vimana Sthana, Chapter 3, Verse 14. Varanasi: Chaukhamba Orientalia.]

Acharya Charaka has elaborated the concept of Janapadodhwamsa along with its causative factors, manifestations and therapeutic measures. In this context, the proper and procedural use of Rasayana is emphasized through the statement, "रसायनानां विधिवच्चोपयोगः प्रशस्यते" (Ch. Vi. 3/14). This classical reference provides the basis for considering appropriate administration of Rasayana in the present context.[Agnivesha. (2011). Charaka Samhita (Yadavji Trikamji, Ed.; Chakrapani Datta, Ayurveda Deepika commentary). Vimana Sthana, Chapter 3, Verse 14. Varanasi: Chaukhamba Orientalia.]

Acharya Sushruta emphasizes that Rasayana therapy should ideally follow Shodhana procedures. The thesis explains this principle by comparing the administration of Rasayana to dyeing a clean cloth, indicating that Rasayana may produce its desired effect more appropriately when the body has been suitably purified.[Sushruta. (2019). Sushruta Samhita (Kewal Krishna Thakral, Ed.; Dalhana, Nibandha Sangraha commentary; Gayadash, Nyaya Chandrika). Vol. 2, Chikitsa Sthana, Chapter 27, Verses 3–4. Varanasi: Chaukhamba Orientalia.]

At the same time, Chakrapani's commentary provides a pragmatic consideration for emergency situations, suggesting that direct administration of Rasayana without prior Shodhana may also be effective under certain circumstances. This classical consideration provides a basis for evaluating an appropriately sequenced Rasayana intervention in comparison with administration without the preceding preparatory intervention.[Agnivesha. (2011). Charaka Samhita (Yadavji Trikamji, Ed.; Chakrapani Datta, Ayurveda Deepika commentary). Vimana Sthana, Chapter 3, Verse 18. Varanasi: Chaukhamba Orientalia.]

The thesis review of literature indicates that specific clinical work evaluating Rasayana Churna Vati in post-COVID-19 management had not been documented. Studies on related Rasayana formulations were reported to provide preliminary evidence regarding immunomodulatory activity and improvement in stress adaptation and quality of life. These observations provided a basis for further clinical evaluation of Rasayana-based intervention in post-COVID-19 management.[Chaudhari, S., et al. (2018). Immunomodulatory activity of Rasayana Churna (a polyherbal Ayurvedic formulation) in Charles Foster rats. Indian Journal of Ayurveda and Integrative Medicine.]

The need for the present study arises from the persistence of symptoms such as fatigue, muscle weakness, respiratory discomfort and neuropsychiatric disturbances following COVID-19. The thesis highlights that

recovery may be prolonged and incomplete in such individuals, resulting in compromised quality of life. Therefore, exploration of Ayurvedic interventions, particularly Rasayana therapies, was considered relevant for post-COVID recovery and restoration. [Nalbandian, A., Sehgal, K., Wan, E. Y., et al. (2021). Post-acute COVID-19 syndrome. Nature Medicine, 27, 601–615.]
The present study was therefore designed to evaluate the clinical efficacy of Rasayana Churna Vati in post-COVID-19 management and to determine whether its Vidhivat Prayoga with Haritaki Churna is more, less or equally effective in comparison with its conventional administration without Haritaki Churna. [Agnivesha. (2011). Charaka Samhita (Yadavji Trikamji, Ed.; Chakrapani Datta, Ayurveda Deepika commentary). Vimana Sthana, Chapter 3, Verse 18. Varanasi: Chaukhamba Orientalia.]

Aim and Objectives

Aim

To evaluate the clinical efficacy of Rasayana Churna Vati in the management of post-COVID-19 manifestations and to assess the effectiveness of its Vidhivat Prayoga with Haritaki Churna in comparison with its conventional administration without Haritaki Churna.

Primary Objectives

1.To assess the clinical efficacy of the restorative effect of Rasayana Churna Vati in the management of post-COVID-19.
2.To assess whether Rasayana Churna Vati administered with Vidhivat Prayoga (with Haritaki Churna) is more, less, or equally effective in comparison with its conventional practice (without Haritaki Churna).

Secondary Objectives

1.To evaluate the immunomodulatory effect of Rasayana Churna Vati through immune markers.
2.To assess the improvement in quality of life.

MATERIALS AND METHODS

1. Study Design

The present study was an open-label, randomized, exploratory clinical trial with an interventional, parallel-assignment design. The clinical phase was conducted to evaluate the efficacy of Rasayana Churna Vati in the management of post-COVID-19 symptoms, with or without prior Shodhana therapy. The study was conducted at the All India Institute of Ayurveda (AIIA), New Delhi, and associated centres within the Delhi-NCR region.

Table 1. Study Design and Sample Distribution

Parameter	Details
Study design	Open-label, randomized, exploratory clinical trial
Research model	Interventional, parallel assignment
Study setting	AIIA, New Delhi
Total participants	60
Group A	30 participants – Rasayana Churna Vati
Group B	30 participants – Haritaki Churna followed by Rasayana Churna Vati

2. Intervention Protocol

Participants were randomly assigned to two treatment groups. Group A received Rasayana Churna Vati, while Group B initially received Haritaki Churna as Shodhana, followed by Rasayana Churna Vati.

Table 2. Intervention Protocol

Parameter	Group A	Group B
Intervention	Rasayana Churna Vati	Haritaki Churna followed by Rasayana Churna Vati
Dose	5 tablets (120 mg each) once daily	Haritaki Churna 3–5 g once daily, followed by Rasayana Churna Vati
Anupana	Lukewarm water	Lukewarm water
Administration	Empty stomach	Empty stomach
Duration	30 days	30 days

3. Eligibility Criteria

Participants aged 21–60 years who had clinically recovered from COVID-19, were RT-PCR negative, and had persistent post-COVID manifestations such as fatigue, joint pain, muscular pain or fever for more than 3–4 weeks were eligible for the study.

Participants below 21 or above 60 years, pregnant or lactating women, those participating in another clinical trial within the previous six months, and individuals with specified significant co-morbidities or receiving immunosuppressive therapy, oral corticosteroids or chemotherapy were excluded. Insulin-dependent diabetes mellitus was also an exclusion criterion.

Table 3. Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Age 21–60 years	Age <21 or >60 years
Clinically recovered COVID-19 and RT-PCR negative	Pregnancy or lactation
History of mild, moderate or severe COVID-19	Recent participation in another clinical trial
Persistent fatigue, joint pain, muscular pain or fever >3–4 weeks	COPD, IHD, CKD, coagulopathies or cancer
—	Immunosuppressive therapy, corticosteroids or chemotherapy
—	Insulin-dependent diabetes mellitus

4. Laboratory Investigations

Routine investigations included CBC, ESR, fasting blood sugar and serum creatinine. Immunological assessment included IgG and IgA, evaluated before and after the intervention.

5. Drug Procurement and Preparation

The raw materials were procured through AIIA following appropriate authorization procedures. The raw drugs underwent pharmacognostical verification and authentication through a recognized quality-control laboratory. The formulations were prepared according to classical Ayurvedic texts and the Ayurvedic Formulary of India (AFI), with quality-control measures maintained during preparation.

6. Treatment Duration and Follow-up

The treatment period was 30 days, followed by a 60-day post-treatment follow-up, giving a total study duration of 90 days.

Table 4. Assessment Parameters and Schedule

Clinical Parameter	Before Treatment	30th Day	60th Day	90th Day
Joint Pain	✓	✓	✓	✓
Fatigue	✓	✓	✓	✓
Muscular Pain	✓	✓	✓	✓
Fever	✓	✓	✓	✓

7. Statistical Analysis

Clinical outcome data for joint pain, fatigue, muscular pain, and fever were analyzed at baseline and during follow-up. Within-group changes across the four assessment time points (before treatment, 30th, 60th, and 90th days) were evaluated using the Friedman test. Pairwise comparisons were performed with Bonferroni

adjustment where applicable. Changes between baseline and the 30th day were assessed using the Wilcoxon signed-rank test. Between-group differences in post-treatment clinical outcomes were assessed using the Mann–Whitney U test. A p-value < 0.05 was considered statistically significant.

RESULTS

Clinical Symptom Outcomes

The clinical symptoms of post-COVID syndrome, including joint pain, fatigue, muscular pain, and fever, were assessed at baseline and during follow-up. The frequency distributions reported in the thesis were used to calculate the Mean ± SD values for the symptom scores. Each group consisted of 30 participants. Lower scores indicated lesser symptom severity.

Table 1. Comparison of clinical symptom scores between Group A and Group B

Clinical Parameter	Group A Baseline, Mean ± SD	Group A Day 30, Mean ± SD	Group B Baseline, Mean ± SD	Group B Day 30, Mean ± SD	Between-group p-value
Joint pain	2.47 ± 0.78	0.77 ± 0.43	2.47 ± 0.78	0.50 ± 0.51	0.034
Fatigue	2.73 ± 1.26	1.13 ± 0.86	2.73 ± 1.26	0.63 ± 0.72	0.022
Muscular pain	2.50 ± 1.36	1.13 ± 0.86	2.50 ± 1.36	0.60 ± 0.77	0.012
Fever	2.00 ± 0.70	0.70 ± 0.47	2.00 ± 0.70	0.40 ± 0.50	0.021

Joint Pain

In Group A, the mean joint-pain score decreased from 2.47 ± 0.78 at baseline to 0.77 ± 0.43 on the 30th day. A similar reduction was observed in Group B, where the score decreased from 2.47 ± 0.78 to 0.50 ± 0.51. The within-group comparison showed a statistically significant improvement in both groups ($p < 0.001$). The four-time-point analysis using Friedman's test also demonstrated a significant difference in Group A ($\chi^2 = 69.576$, $p < 0.001$) and Group B ($\chi^2 = 70.714$, $p < 0.001$). On comparison between the groups at the 30th day, Group B showed significantly lower joint-pain scores than Group A (Mann–Whitney U = 330.000, p = 0.034).

Fatigue

The mean fatigue score in Group A decreased from 2.73 ± 1.26 at baseline to 1.13 ± 0.86 on the 30th day, whereas in Group B it decreased from 2.73 ± 1.26 to 0.63 ± 0.72. The improvement from baseline to the 30th day was statistically significant in both groups ($p < 0.001$). Friedman's test confirmed significant differences across the four assessment points in Group A ($\chi^2 = 49.702$, $p < 0.001$) and Group B ($\chi^2 = 54.311$, $p < 0.001$). The between-group comparison at the 30th day demonstrated a statistically significant difference in favour of Group B (Mann–Whitney U = 304.500, p = 0.022).

Muscular Pain

The mean muscular-pain score decreased from 2.50 ± 1.36 to 1.13 ± 0.86 in Group A and from 2.50 ± 1.36 to 0.60 ± 0.77 in Group B by the 30th day. The within-group improvement was statistically significant in both groups ($p < 0.001$). Significant differences across the four assessment points were also observed by Friedman's test in Group A ($\chi^2 = 32.259$, $p < 0.001$) and Group B ($\chi^2 = 36.214$, $p < 0.001$). The 30th-day comparison between groups showed a statistically significant difference, with lower muscular-pain scores in Group B (Mann–Whitney U = 290.000, p = 0.012).

Fever

The mean fever score decreased from 2.00 ± 0.70 at baseline to 0.70 ± 0.47 on the 30th day in Group A, while in Group B it decreased from 2.00 ± 0.70 to 0.40 ± 0.50. The baseline-to-30th-day comparison was statistically significant in both groups ($p < 0.001$). Friedman's test demonstrated significant changes across the four assessment points in Group A ($\chi^2 = 59.066$, $p < 0.001$) and Group B ($\chi^2 = 68.233$, $p < 0.001$). The between-group comparison at the 30th day also showed a statistically significant difference in favour of Group B (Mann–Whitney U = 315.000, p = 0.021).

Overall Summary of Clinical Findings

Overall, both treatment groups demonstrated significant improvement in joint pain, fatigue, muscular pain, and fever over the course of treatment. However, the mean symptom scores at the 30th day were consistently lower in Group B than in Group A. The between-group analysis showed statistically significant differences for joint pain (p = 0.034), fatigue (p = 0.022), muscular pain (p = 0.012), and fever (p = 0.021). These findings indicate a significantly greater reduction in the assessed clinical symptoms in Group B at the 30th-day evaluation.

5. DISCUSSION

The present study evaluated the clinical response of Rasayana Churna Vati alone and Haritaki Churna followed by Rasayana Churna Vati in post-COVID-19 patients. Joint pain, fatigue, muscular pain and fever were assessed during treatment and follow-up. Both groups showed significant improvement in all four clinical parameters.

5.1 Joint Pain

A significant reduction in joint pain was observed in both groups after treatment. The difference between the groups at the 30th day was also statistically significant ($p = 0.034$). Joint pain and other musculoskeletal manifestations are commonly reported in patients with post-COVID-19 condition.[Swarnakar, R., Jenifa, S., & Wadhwa, S. (2022). Musculoskeletal complications in long COVID-19: A systematic review. World Journal of Virology, 11(6), 485–495. https://doi.org/10.5501/wjv.v11.i6.485 (PubMed Central (PMC))]

The improvement observed in the present study may be considered in relation to the properties of the interventions used. According to the Ayurvedic rationale described in the thesis, Haritaki possesses Deepana, Pachana and Anulomana actions, while Rasayana Churna Vati is considered to provide Rasayana and Balya effects. These properties may have contributed to the improvement in musculoskeletal symptoms.

5.2 Fatigue

Fatigue showed significant improvement in both groups, with a statistically significant difference between the groups at the 30th day ($p = 0.022$). Fatigue is one of the common manifestations of post-COVID-19 condition and may continue after recovery from the acute infection.[Castaldo, M., Ebbesen, B. D., Fernández-de-las-Peñas, C., Arendt-Nielsen, L., & Giordano, R. (2023). COVID-19 and musculoskeletal pain: An overview of the current knowledge. Minerva Anestesiologica, 89(12), 1134–1142. https://doi.org/10.23736/S0375-9393.23.17471-2]

The comparatively greater improvement observed in Group B may be related to the sequential use of Haritaki Churna followed by Rasayana Churna Vati. The thesis describes the possible role of Haritaki through Agni Deepana, Ama Pachana and Vata Anulomana, followed by the restorative effects of Rasayana therapy.

The improvement observed during treatment was maintained during follow-up. The thesis reports significant improvement between baseline and subsequent assessments, whereas differences among the later follow-up assessments were not statistically significant.

5.3 Muscular Pain

Muscular pain showed significant improvement in both groups. The between-group comparison at the 30th day demonstrated a statistically significant difference ($p = 0.012$), with a lower symptom score in Group B.

Terminalia chebula (Haritaki) has been reported to possess several pharmacological activities, including antioxidant and anti-inflammatory effects.[Bulbul, M. R. H., Chowdhury, M. N. U., Naima, T. A., Sami, S. A., Imtiaj, M. S., Huda, N., & Uddin, M. G. (2022). A comprehensive review on the diverse pharmacological perspectives of Terminalia chebula Retz. Heliyon, 8(8), e10220. https://doi.org/10.1016/j.heliyon.2022.e10220 (PubMed)] These properties may be relevant to further investigation of its role in inflammatory and pain-related manifestations.

Evidence from herbal pharmacological research suggests that plant-derived bioactive compounds with antioxidant and anti-inflammatory properties may have relevance in reducing pain and muscular discomfort. Clinical and experimental studies of ginger have reported reductions in muscular soreness and pain, supporting further investigation of botanical interventions in pain-related conditions.[Gupta, J., Sharma, B., Sorout, R., Singh, R. G., Ittishree, & Sharma, M. C. (2024). Ginger (Zingiber officinale) in traditional Chinese medicine: A comprehensive review of its anti-inflammatory properties and clinical applications. Pharmacological Research - Modern Chinese Medicine, 14, 100561. https://doi.org/10.1016/j.prmcm.2024.100561]

The thesis attributes the improvement observed in Group B to the combined use of Haritaki Churna and Rasayana Churna Vati. Haritaki may contribute through Deepana, Pachana and Srotoshodhana, whereas Rasayana Churna Vati may support Rasayana, Balya and Dhatu Poshana.

The reported pharmacological literature also describes the traditional uses, phytochemical constituents and biological activities of Terminalia chebula, providing a basis for further experimental and clinical evaluation.[Nigam, M., Mishra, A. P., Adhikari-Devkota, A., Dirar, A. I., Hassan, M. M., Adhikari, A., Belwal, T., & Devkota, H. P. (2020). Fruits of Terminalia chebula Retz.: A review on traditional uses, bioactive chemical constituents and pharmacological activities. Phytotherapy Research, 34(10), 2518–2533. https://doi.org/10.1002/ptr.6702 (PubMed)]

The improvement in muscular pain was maintained during follow-up. Significant differences were observed between baseline and subsequent assessments, while differences between the later post-treatment assessments were not significant.

5.4 Fever

A significant reduction in fever was observed in both groups after treatment. The between-group comparison at the 30th day was statistically significant ($p = 0.021$). The four-time-point analysis also showed significant changes during treatment and follow-up.

The reduction in fever represents improvement in one of the clinical manifestations assessed in the present study. However, as the study was based on clinical symptom assessment, the specific biological mechanism responsible for this improvement cannot be established from the present data.

From the Ayurvedic perspective, the clinical response may be considered in relation to the sequential approach used in Group B. Haritaki was administered before Rasayana Churna Vati, with the thesis describing the possible role of Deepana, Pachana and Anulomana actions followed by the restorative effects of Rasayana therapy.

5.5 Comparative Clinical Response

Both groups showed significant improvement in joint pain, fatigue, muscular pain and fever. Statistically significant differences were observed between the groups for joint pain ($p = 0.034$), fatigue ($p = 0.022$), muscular pain ($p = 0.012$) and fever ($p = 0.021$).

The present findings are of particular interest because evidence regarding interventions specifically targeting post-COVID fatigue remains limited. A systematic review of traditional, complementary and integrative medicine interventions found some evidence of benefit for post-COVID fatigue, but also noted that the available evidence was limited in certainty and that larger, better-designed trials are required.[Chen, X.-Y., Lu, C.-L., Wang, Q.-Y., Pan, X.-R., Zhang, Y.-Y., Wang, J.-L., Liao, J.-Y., Hu, N.-C., Wang, C.-Y., Duan, B.-J., Liu, X.-H., Jin, X.-Y., Hunter, J., & Liu, J.-P. (2024). Traditional, complementary and integrative medicine for fatigue post COVID-19 infection: A systematic review of randomized controlled trials. Integrative Medicine Research, 13(2), 101039. https://doi.org/10.1016/j.imr.2024.101039 (PubMed)]

In the present study, the sequential use of Haritaki Churna followed by Rasayana Churna Vati was associated with significant improvement in the assessed clinical symptoms. The findings support further clinical evaluation of this approach in post-COVID-19 recovery. However, the present study does not establish a specific pharmacological mechanism, and the findings should therefore be interpreted within the limitations of the study design.

6. CONCLUSION

The present clinical study showed significant improvement in the assessed post-COVID-19 symptoms, including joint pain, fatigue, muscular pain and fever, in both treatment groups.

The improvement was observed during the treatment period and was maintained during the subsequent follow-up assessments. Significant differences were also observed between the two groups for all four clinical parameters.

Group B, which received Haritaki Churna followed by Rasayana Churna Vati, showed a comparatively better clinical response than Group A receiving Rasayana Churna Vati alone. The findings suggest that the sequential use of Haritaki Churna followed by Rasayana Churna Vati may be a useful approach for the management of selected clinical manifestations of post-COVID-19 syndrome.

However, the findings should be interpreted within the scope of the present study, and further studies with larger sample sizes and longer follow-up are required to confirm these observations.

7. Limitations of the Study

The present study has certain limitations that should be considered while interpreting the findings. The study was conducted with a limited sample size and within a specific study setting, which may restrict the generalizability of the findings. The follow-up period was also limited to 90 days. In addition, the assessment was based mainly on selected clinical symptoms of post-COVID-19 syndrome. Therefore, studies involving larger sample sizes, multiple centres and longer follow-up periods may provide further evidence regarding the clinical effectiveness of the interventions.

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Critical Revision of the Manuscript: Dr. Ritu Jyani, Dr. Virendra Singh, Dr. Saurabh Garg
Final Approval of the Manuscript: All authors approved the final version and agree to be accountable for all aspects of the work.

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Conflict of Interest

The authors declare that there are no conflicts of interest regarding the publication of this manuscript.

Ethical Approval

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki and was approved by the Institutional Ethics Committee of the All India Institute of Ayurveda (AIIA), New Delhi. All participants provided written informed consent before enrollment.

Informed Consent
Written informed consent was obtained from all participants prior to their inclusion in the study.
Data Availability Statement
The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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