



Review Article

YAKRUT KARMA IN POST-COVID SEQUELAE: AN INTEGRATIVE REVIEW

C Devaki Krishna^{1*}, Vidula Gujjarwar²

¹PG scholar, ²HOD, Department of Roga Nidana, Chaudhary Brahm Prakash Ayurveda Charak Sansthan, Najafgarh, New Delhi, India.

Article info

Article History:

Received: 18-09-2025

Accepted: 23-10-2025

Published: 30-11-2025

KEYWORDS:

Rasa Rakta Dushti,
Yakrut Karma, Long
COVID, Liver health.

ABSTRACT

Post-COVID syndrome presents with a wide range of persistent symptoms, including fever, fatigue, hypertension, anorexia, digestive ailments, body aches, nausea, and malnutrition. According to Ayurveda, all these manifestations closely resemble the classical symptoms of *Rasa Dhatu Dushti*. When the quality of *Rasa* is compromised, its successive transformation into *Rakta Dhatu* is hindered, predisposing to disturbances in the blood tissue and related metabolic domains, with the *Yakrut* presenting as the primary site of dysfunction. This review analyses post-COVID sequelae in the framework of *Yakrut Karma* and *Rasa-Rakta Dhatu Dushti*, investigating how persistent changes in *Rasa Dushti* after COVID can result in underlying *Rakta Dushti*, which ultimately presents as liver damage. Modern clinical findings such as higher liver enzyme levels, metabolic disturbances, and persistent inflammation correlate with the Ayurvedic overview of impaired *Yakrut Karma*, indicating altered liver function and metabolism. An effort has been undertaken to connect recent scientific evidence with traditional interpretations of *Dhatu* imbalance, highlighting the importance of Ayurveda in assessing liver health following COVID-19.

INTRODUCTION

The world is experiencing a burning disaster because of COVID-19, which the WHO has labelled an emergency. Since the start, a lot of work has been done to screen for the prevalence and patterns of COVID-19 symptoms, but more research is still needed to fully understand the post-COVID state. Millions of people have been infected, with nearly 7 million deaths as of July 10, 2023^[1], and the number of "long-haulers" is rising quickly. Understanding the diversity of post-COVID situations is therefore essential. This viral infection may cause the liver to become unstable, which indicates that the body is at its highest level of awareness. According to Ayurvedic Samhitas, the liver is described under the term *Yakrut*. It serves as the hub for the metabolism of nutrients (carbohydrates, lipids, and proteins) and the excretion of waste metabolites, detoxifying and eliminating foreign contaminants, and

performing constant maintenance of the body's health. The significance of liver function, or *Yakrut Karma*, in sustaining health in the post-COVID state is thus emphasized. Ayurveda describes epidemics in the context of *Janapadodhwamsa*, highlighting pollution of *Vayu*, *Udaka*, *Desha*, and *Kala* as the cause of the large-scale disease spread.^[2] However, the attack of "*Bhootas*" also has a substantial effect on the pathology of these *Vikaras*, which can be understood with the concept of microbes (viruses, bacteria, and other microorganisms).^[3] These microorganisms are observed as external causative agents that produce *Agantuja Vyadhi*. Hence, microbial diseases like COVID-19 can be grouped under *Bhutabhishanga Vyadhi* in Ayurveda.^[4] LONG COVID is a general term used for people who have recovered from COVID-19 but still exhibit symptoms for longer than would be expected. It is a pathologic entity involving persistent physical, medical, and cognitive repercussions following infection, leading to severely worsened quality of life. The most common symptoms reported include fatigue, dyspnea, hair loss, arthralgia, attention deficit, palpitations, smell and taste dysfunctions, gastrointestinal and cardiac issues, and cough.^[5] In Ayurveda, these can be correlated with *Rasa Vaha*

Access this article online

Quick Response Code



<https://doi.org/10.47070/ayushdhara.v12i5.2310>

Published by Mahadev Publications (Regd.)
publication licensed under a Creative Commons
Attribution-NonCommercial-ShareAlike 4.0
International (CC BY-NC-SA 4.0)

Srotho Dushti. Ayurveda defines the liver (*Yakrut*) as the seat of *Rakta Dhatu*. COVID-19, taken as *Vata-Kapha Jwara* or *Sannipata Jwara*, leads to *Rasa Dhatu Pradoshaja Vikara*, thereby altering the normal development and functioning of *Rakta Dhatu* and contributing to hepatic damage, the principal site of *Rakta Dhatu* formation.

METHOD

A thorough review of Ayurvedic classical texts, including the *Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*, along with contemporary scientific literature, journals, recent publications, and internet sources (PubMed, Research Gate, etc) was undertaken to explore concepts of *Rasa*, *Rakta*, and *Yakrut Karma* in relation to hepatic involvement during post-COVID syndrome.

RESULT

Post-COVID sequelae: clinical overview

Following the respiratory system, the liver is identified as one of the organs most susceptible to COVID-19. Clinical evidence reveals that 15 to 53 percent of patients have some degree of liver involvement, commonly manifested as lymphatic portal inflammation, vascular congestion, haemorrhage, and hepatocyte death.^[6] Studies uncovered that 6 to 16.7 percent of COVID-19 patients experienced jaundice^[7] and a peak TBIL (Total Bilirubin) value indicating a significant systemic inflammation.^[8] Jaundice can be correlated with *Kamala*, which is described as a *Rakta-pradushtitha Vyadhi* characterized primarily by *Agnimandya* (diminished digestive and metabolic activity). Vitiating of *Agni* forms the fundamental basis for the pathogenesis of a disease. The symptoms of COVID-19, such as a moderate to high fever (*Jwara*), nausea (*Hrullasa*), dysgeusia (*Aasya Vairasya*), anorexia (*Arochakam*), dyspepsia (*Avipakata*), laziness (*Alasyam*), heaviness (*Gourava*), etc., are identical to the *Sama Lakshanas* described in *Charaka Chikitsa Sthana*.^[9] *Ama*, caused by *Agni Kshaya* and partial digestion of *Rasa Dhatu*, could be considered as the primary source of inflammatory cytokines or as an energy source for COVID-19 viruses.^[10] *Dhatupaka* follows *Agni Dushti*. Increased prothrombin time, SGOT, SGPT, LDH, and D-dimer in COVID-19 can be linked to *Rasa* and *Rakta Dhatupaka*.

Post-COVID Rasa Dhatu Dushti

One way to conceptualize infectious diseases like COVID-19 is as communicable diseases, also known as *Sankramaka Roga* or *Aupasargika Roga*.^[11] Based on its clinical presentations, COVID-19 can be correlated with *Bhutabhishangaja Jwara*, *Vata-Kaphaja Jwara*, and *Sannipatika Jwara*. *Prana Vaha Sroto Dushti* contributes to COVID-19 symptoms like *Shwasa*, *Kasa*,

Pratishyaya, and *Shirograha* and have been linked with *Abhyantara roga marga*.^{[12][13]} *Santapa*, *Sweda apravartanam*, *Parva-bheda*, *Mukhashosha*, *Tandra* etc, are brought upon by *Rasa Vaha Sroto Dushti*. The pathophysiology of COVID-19 illness thus involves both *Srotas*. *Acharya Charaka* describes *Rasapradoshaja Vikaras* analogous to the patterns observed in COVID-19: *Ashraddha* (disinclination for food), *Aruchi* (anorexia), *Aasyavairasya* (tastelessness of mouth), *Arasagyata* (ageusia/hypogeusia/loss of taste), *Hrillasa* (nausea), *Gaurava* (heaviness), *Tandra* (drowsiness/lassitude), *Angamarda* (generalized body ache), *Jwara* (fever), *Tama* (black out/fainting), *Pandu* (pallor), *Srotasaam Rodha* (obstruction to *Srotas*), *Klaibya* (impotence), *Saada* (exhaustion/ tiredness to body), *Krishangata* (emaciated or thin body), *Nashoagneya* (loss of *Agni*), and *Ayathakalam Valipalita* (premature appearance of wrinkles and grey hairs)^[14]. The symptoms of *kapha Heena Pitha Madhya Vataadhika jwara*, also called *Sammohaka Sannipata Jwara* closely resemble COVID-19 manifestations.^[15] *Vata-Kaphaja Jwara* presenting with characteristic phenotypic expressions such as *Sheetako* (colds), *Gaurav* (generalized heaviness), *Tandra* (laziness), *Staimityam* (excess chills), *Parvanam Bheda* (arthralgia /joint pain), *Shirograha* (headache), *Pratishyaya* (running nose and/or nose block), and *Madhya-vega Santapa* (mild fever), reflects COVID-19 symptomology.^[16]

When evaluated using the GLIM (Global Leadership Initiative on Malnutrition) criteria, COVID-19 survivors were found to have malnutrition associated with dysgeusia and loss of appetite.^[17] Acute weight loss was documented during hospitalization, with 58% reporting decreased appetite, 49% experiencing early satiety, and 73% identified as being at high risk for developing sarcopenia.^[18] A meta-analysis of 24,410 confirmed COVID-19 patients reported cases of fever, fatigue, myalgia, diarrhoea, vomiting, nausea, stomach discomfort, arthralgia, hyposmia, and hypogeusia.^[19] Seventy-five percent showed a significantly increased DNA Fragmentation Index (DFI) along with decreased sperm concentration, count, and motility.^[20] Infertility has been linked to anti-Mullerian hormone deficiency in the post-COVID phase, which lowers ovarian reserve.^[21] Excessive hair loss was observed within two to three months of infection, with telogen effluvium suggested as the potential cause.^[22] COVID in acute and post-illness phases is associated with anxiety, depression, memory loss, insomnia, and other mental health issues, which may contribute to premature hair loss and greying.^[23] These study outcomes collectively suggest derangement of *Rasa dhatu* and its related *Srotas*.

Progression: Rasa Dushti to Rakta Dushti

The *Saptha Dhatus* (tissues), namely *Rasa*, *Rakta*, *Mamsa*, *Medas*, *Asthi*, *Majja*, and *Sukra* promote overall bodily stability. In *Charaka Samhitha*, *Grahani Chikitsa*, *Acharya* explained the process of transformation of these nourishing portions of the digested food as similar to a rotating wheel. *Rakta* is produced from *Rasa*. After *Rakta*, *Mamsa* is formed. After *Mamsa*, *Medas* is formed, and then *Asthi* is formed. From *Asthi*, *Majja* is formed, and then *Sukra* from *Majja*.^[24] The seven *Dhatus* are metabolized or transformed into two kinds of products known as *Sara* (nutrients) and *Kitta* (wastes), which is the function of seven specific entities known as *Dhatvagni*. The entire sequence of transformation and metabolism of *Dhatus* is interdependent. Hence, it can be understood that any vitiation in the *Rasa dhatu* can hinder the proper formation of *Rakta Dhatu*. The nourishment fluid formed, known as *Rasa*, undergoes transformation by the *Ushma* (heat) of pitta and gets converted into the red colored tissue known as *Rakta*.^[25] The process of *dhatu* formation thus begins with the digestion and absorption of food, leading to the formation of *Rasa dhatu*. *Rasa* is then transformed into *Rakta*, followed by *Mamsa*, *Medas*, *Asthi*, *Majja*, and finally *Sukra*/*Arthava*. Each *Dhatu* nourishes the subsequent one in a continuous cycle. This transformation process is vital for maintaining health and ensuring that each tissue receives proper nourishment. Any disruption or imbalance in this sequence can lead to various health issues. In COVID-19, *Rasa Vaha Srotho Dushti* and *Rasa Dhatu Dusyam* can thus contribute to an imbalance in the *Rakta Dhatu*, leading to a cascade of events affecting its quality.

Acharya Susruta has described *Mamsa Dhatu* as the seat of *Raktadhara kala*, particularly in the blood vessels (*Sira*) and the haemopoietic organs like the liver (*Yakrut*) and spleen (*Pleeha*).^[26] It is considered analogous to the endothelium, the inner lining of blood vessels.^[27] The binding of SARS-CoV-2 to vascular ACE2 receptors initiates a severe inflammatory response, disrupting endothelial haemostasis. An uncontrolled release of cytokines in COVID-19 (IL-6, IL-1 β , TNF- α) activates platelets, promoting clot formation and leading to thrombocytopenia.^[28] Increased fibrinogen, Factor VIII, and von Willebrand factor (vWF) trigger hypercoagulability.^[29] The accumulation of angiotensin II exacerbates endothelial injury, ultimately leading to arterial blood pressure.^[30] Shortened PT (prothrombin time) and APTT (Activated Partial Thromboplastin Time) can lead to complications and even death.^[31] These are visible indicators of deteriorating *Rakta Dhatu*. *Acharya Charaka* describes *Kustha*, *Visarpa*, *Pidika*, *Nilika*, *Vyanga*, *Piplava*, *Tilakalaka*, *Dadru*, *Carmadala*, *Switra*, *Pama*, *Kotha*, and *Asramandala*

among the *Rakta Pradoshaja Vikaras* (diseases of *Rakta Dhatu Dushti*), demonstrating cutaneous signs brought on by the vitiated blood. Urticarial rash, vesicular rash, maculopapular and morbilliform eruptions, chilblain-like lesions, livedoid, and petechial lesions were prevalent among COVID-19 patients.^[32] In rare cases, there have been reports of oral thrush, vitiligo-like hypopigmentation, pigmented purpuric dermatosis, and the reactivation or exacerbation of pre-existing skin conditions.^[33]

Yakrut as the seat of Rakta Dhatu: Ayurvedic insights

Yakrut is classified as a *Kostha-gata* organ, essential for *Rasa* to *Rakta Dhatu* transformation. The liver (*Yakrut*) and spleen (*Pleeha*) are referred to as *Sonitha Sthana*, or the seat of *Rakta Dhatu*, as they collectively preserve the structural and functional integrity of *Rakta Dhatu*. Their anomalies are closely associated with haematological disorders described in Ayurveda, such as *Pandu*, *Kamala*, and *Plihodara*. The origin of the word '*Yakrut*' is from the root term "*Yakan*", meaning the liver. *Yakrut* is the combination of two words: "*Ya*" meaning activity, and "*Krit*" meaning breakdown.^[34] According to *Acharya Susruta*, it is of maternal origin and formed from the *Rakta Dhatu*. The three *Bhavapadarthas*- *Samana Vayu*, *Dehoshma*, and *Rakta Dhatu*- are involved in the development of *Yakrut*, *Pleeha*, and *Kloma*, according to *Acharya Arunadatta*. In ancient literature, *Yakrut* has synonyms such as *Jyotisthana*, *Raktadhara*, and *Raktashaya*.^[35] Together with *Pleeha* (spleen), it is regarded as the *Moola sthana* (root) of *Rakta Vaha Srothas* and the site of *Ranjaka Pitta*, which imparts color to *Rasa* to form *Rakta*. It corresponds to haematopoiesis, carried out by the liver during intrauterine life.

The hepatic bud and septum transversum, which are components of the mesoderm, together form the liver. The mesoderm also produces hemocytoblasts and lymphoblasts, which are the precursors of blood cells. It is evident that the mesoderm, the basic material used to make liver and blood, is the same. The umbilical and vitelline veins pass through the septum transversum during the early stages of embryonic development, providing an ample supply of blood. As the liver tissue develops and encircles the umbilical and vitelline veins, they split apart and change into the liver's sinusoids during foetal development. The umbilical veins form the ductus venosus, which then develops into the ligamentum teres hepatis after birth, while the vitelline sinusoids contribute to the portal vein and other hepatic veins. *Rakta dhatu* is thus necessary for replenishing and sustaining the liver's functional capacity. Studies have revealed that individuals with COVID-19 experience endothelial

injuries, coagulation disorders, and inflammatory blood changes that align with the traditional description of *Rakta Dushti*. Any disturbance in *Rakta Dhatu* due to COVID-19 can inevitably impair hepatic health.

Post-COVID Hepatic Involvement

In the liver, ACE2 receptors are abundantly expressed in cholangiocytes and the endothelium layer of small blood vessels, and in a lesser amount in hepatocytes, making the organ susceptible to COVID-19. Several drugs prescribed to manage COVID-19 and associated symptoms, such as antivirals, antibiotics, acetaminophen, corticosteroids, and anti-pyretic, which are metabolized through the liver, may lead to hepatotoxicity. Hypoxia leads to decreased liver artery perfusion and ischemic reperfusion injury. Inflammatory cytokines such as granulocyte macrophage-colony stimulating factor (GM-CSF), monocyte chemoattractant protein-1 (MCP-1), IL-1 β , IL-2, IL-6, IL-10, IFN- γ , TNF- α , and IFN- γ -inducible protein 10 (IP-10) are elevated in COVID-19 patients.^[36] Heightened liver stiffness and steatosis levels are indicative of hepatic injury. Higher concentrations of ALT, AST, ALP, and GGT point to underlying hepatocellular and cholangiocellular.^[37]

Patients developed progressive cholestatic liver injury that lasted for weeks to months, along with intrahepatic duct dilatation, structuring, and irregularity.^[38] Mild portal changes, canalicular cholestasis, bile duct damage, and noticeable biliary blockage were observed in liver biopsies. Elevated levels of fibrinogen and D-dimer suggest a hypercoagulable state and significant systemic inflammation. An increased level of Hyaluronic acid, LDH, CRP, ferritin, IL-6, and ESR, and a liver fibrosis index (FIB-4) greater than 3.25 were noticed.^[39] Viral particle aggregates were detected in the cholangiocytes and endothelial cells of hepatic sinusoids.^[40] Following recovery from COVID-19, juvenile patients presented with severe necrosis, cholangiolar proliferation, and lymphocytic infiltration.^[41] All of the above indicators of liver damage clearly illustrate the ayurvedic theory that *Rasa Dushti* initiates a pathogenic cascade that leads to *Rakta Dushti* and hepatic dysfunction. The upstream *Rasa* vitiation marked by defective *Dhatu Poshana* (impaired tissue nourishment) lays the groundwork for *Rakta Dushti* (endothelial injury, hypercoagulability, and hepatic parenchymal damage), eventually manifesting as structural and functional impairment of the liver (*Yakrut*).

DISCUSSION

Persistent symptoms and organ-specific impacts have made the post-COVID era a complex clinical entity. Among these, hepatic dysfunction has gained more recognition due to its immune-mediated pathogenesis and viral invasion, as well as the side effects of medications, including antibiotics, corticosteroids, and antivirals. Disturbance in *Rasa Dhatu*, the body's primary fluid, creates circumstances favourable for *Rakta Dushti*, directly affecting the blood's flow, purity, and functional quality. Cutaneous manifestations, endothelial pathology, mitochondrial dysfunction, massive cytokine production, and thrombosis observed during and after COVID-19 infection vividly demonstrate how *Rakta Dushti* manifests in tangible, visible ways. Higher inflammatory markers like CRP and ferritin add scientific weight to this classical viewpoint, as they directly reflect the body's struggle with altered *Rakta Dhatu*.

According to Ayurveda, *Yakrut* functions as more than merely an organ; it is the seat of the *Rakta Vaha Srotas*, where life-giving fluids transform into the blood that nourishes all of our cells, providing our lives their vibrant color. An alteration in the balance between *Rasa* and *Rakta* triggers several changes that affect our vitality, such as elevated liver enzymes, fluctuating bilirubin levels, or severe hepatic distress, all indicators of defective *Dhatu Poshana* and *Agni Dushana*, which might result in a disordered *Yakrut Karma*. More than merely a medical diagnosis, the persistent inflammation that many people endure following COVID-19 is an echo of imbalance, which Ayurveda has long identified as *Dosha sanchaya* and *Srotodushti*, where the body's vital forces and channels become strained and obstructed. Despite substantial progress in understanding post-COVID liver dysfunction, major gaps remain. Few clinical investigations are linking Ayurvedic concepts, such as *Yakrut Karma*, to hepatic symptoms following COVID-19 infection. Correlations between modern biomarkers, such as liver enzymes and inflammatory markers, and Ayurvedic parameters, such as *Agni* (digestive fire), *Dosha Satmyata*, and *Dhatu Poshana*, can offer valuable evidence and reconcile traditional and contemporary perspectives.

CONCLUSION

Post-COVID sequelae are emerging as a complex challenge, with hepatic dysfunction as a significant concern affecting long-term health and recovery. Long-term COVID clinical manifestations correspond with *Rasa Dhatu Dushti*, which subsequently develops into *Rakta Dushti*, according to Ayurveda. The liver (*Yakrut*) is the root of *Rakta Vaha*

Srotas and acts as the *Agni Sthana* (place of digestive fire) because of its vital role in digestion and metabolism, making it highly vulnerable during the post-COVID phase, often leading to hepatic dysfunction. This framework underlines the need for prompt measures to restore *Dhatu-satmya* and re-establish *Yakrut Karma*, thereby promoting better long-term recovery.

REFERENCES

1. <https://data.who.int/dashboards/covid19/cases?n=c>
2. Agnivesha; Charaka; Dridhabala. The Caraka Samhita. Edited by Shastri KN, Chaturvedi GC. Varanasi: Chaukhambha Bharati Academy; 2016. Vol 1, Vimana Sthana 3/6.
3. Kumar S. Ayurveda interpretation, diagnostic, and probable management of COVID-19 pandemic. Journal of Indian System of Medicine. 2020; 8(2): 91.
4. Agnivesha; Charaka; Dridhabala. Charaka Samhita. With Vidyotini Hindi commentary by Shastri KN. Varanasi: Chaukhambha Bharati Academy; 2007. Vol 2, Chikitsa Sthana 3/114–118, p.124–125.
5. Carfi A, Bernabei R, Landi F. Persistent Symptoms in Patients After Acute COVID-19. JAMA. 2020 Aug 11; 324(6): 603.
6. Su YJ, Chang CW, Chen MJ, Lai YC. Impact of COVID-19 on liver. World J Clin Cases. 2021 Sep 26; 9(27): 7998–8007.
7. Ong J, Dan YY. GI-COVID: Are There COVID-19 Patients with Primary Gastrointestinal SARS-CoV-2 Infection and Symptoms? Dig Dis Sci. 2021 Oct 11; 66(10): 3228–30.
8. Bender JM, Worman HJ. Jaundice in patients with <scp>COVID</scp> -19. JGH Open. 2021 Oct 24; 5(10): 1166–71.
9. Agnivesha; Charaka; Dridhabala. Charaka Samhita. Edited with elaborated Vidyotini Hindi commentary by Shastri KN, Chaturvedi GN. Varanasi: Chaukhambha Bharati Academy; 2007. Part II, Chikitsa Sthana 15/73–74, p.464.
10. Adluri USP, Tripathi AC. Understanding COVID - 19 pandemic– A comprehensive Ayurvedic perspective. J Ayurveda Integr Med. 2022 Jan; 13(1): 100348.
11. Susruta. Susruta Samhita. Edited with Ayurveda-Tattva-Sandeepika Hindi commentary by Shastri KA. Varanasi: Chaukhambha Sanskrit Sansthan; 2006. Vol 1, Nidan Sthana 5/33.
12. Vagbhata. Astanga Hridaya. Edited with Vidyotini Hindi commentary by Gupta A. Revised by Upadhyaya Y. Varanasi: Chaukhambha Prakashan; 2011. Sutrasthana 12/44–49.
13. Agnivesha; Charaka; Dridhabala. The Caraka Samhita. Edited by Shastri KN, Chaturvedi GN. Varanasi: Chaukhambha Bharati Academy; 2016. Vol 1, Vimana Sthana 5/7.
14. Charaka. Agnivesha Charaka Samhita: Sutrasthana, Chapter 28, p. 576. In: Dash B, Sharma RK, editors. Ayurveda Dipika by Chakrapani Datta. 2012 ed. Varanasi: Chaukhambha Sanskrit Series; 2012.
15. Agnivesha; Charaka; Dridhabala. Charaka Samhita. With Vidyotini Hindi commentary by Shastri KN. Varanasi: Chaukhambha Bharati Academy; 2007. Vol 2, Chikitsa Sthana 3/101.
16. Agnivesha; Charaka; Dridhabala. Charaka Samhita. With Vidyotini Hindi commentary by Shastri KN. Varanasi: Chaukhambha Bharati Academy; 2007. Vol 2, Chikitsa Sthana 3/86–87
17. Tosato M, Calvani R, Ciciarello F, Galluzzo V, Martone AM, Zazzara MB, et al. Malnutrition in COVID-19 survivors: prevalence and risk factors. Aging Clin Exp Res. 2023 Sep 4; 35(10): 2257–65.
18. Wierdsma NJ, Kruijenga HM, Konings LAML, Krebbers D, Jorissen JRM, Joosten MHI, et al. Poor nutritional status, risk of sarcopenia and nutrition related complaints are prevalent in COVID-19 patients during and after hospital admission. Clin Nutr ESPEN. 2021 Jun; 43: 369–76.
19. Grant MC, Geoghegan L, Arbyn M, Mohammed Z, McGuinness L, Clarke EL, et al. The prevalence of symptoms in 24,410 adults infected by the novel coronavirus (SARS-CoV-2; COVID-19): A systematic review and meta-analysis of 148 studies from 9 countries. PLoS One. 2020 Jun 23; 15(6): e0234765.
20. Yuan L, Sun W, Dong Z, Lu L, Wang X, Du Q, et al. COVID-19 infection was associated with poor sperm quality: a cross-sectional and longitudinal clinical observation study. Sci Rep. 2025 Apr 3; 15(1): 11380.
21. Madaan S, Talwar D, Jaiswal A, Kumar S, Acharya N, Acharya S, et al. post-COVID-19 menstrual abnormalities and infertility. J Educ Health Promot. 2022 Jan; 11(1): 170.
22. Seyfi S, Alijanpour R, Aryanian Z, Ezoji K, Mahmoudi M. Prevalence of telogen effluvium hair loss in COVID-19 patients and its relationship with disease severity. J Med Life. 2022 May; 15(5): 631–4.
23. Manchia M, Gathier AW, Yapici-Eser H, Schmidt M V., de Quervain D, van Amelsvoort T, et al. The impact of the prolonged COVID-19 pandemic on stress resilience and mental health: A critical review across waves. European Neuropsychopharmacology. 2022 Feb; 55: 22–83.
24. Charaka. Agnivesha Charaka Samhita: Chikitsa Sthana, Chapter 15/16. In: Dash B, Sharma RK, editors. Ayurveda Dipika by Chakrapani Datta. 2012 ed. Varanasi: Chaukhambha Sanskrit Series; 2012.

25. Charaka. Agnivesha Charaka Samhita: Chikitsa Sthana, Chapter 15/28. In: Dash B, Sharma RK, editors. Ayurveda Dipika by Chakrapani Datta. 2012 ed. Varanasi: Chaukhamba Sanskrit Series; 2012.
26. Sushruta. Sushruta Samhita, Sharirasthana 4/10. In: Prof.K.R.Srikantha Murthy, editor. Varanasi: Chaukhambha Orientalia; 2014.
27. Giri D, Chouragade N. A critical analysis of Raktadhara Kala in perspective of Acharya Sushrut. Journal of Indian System of Medicine. 2019; 7(1): 28.
28. Alharbi MG, Alanazi N, Yousef A, Alanazi N, Alotaibi B, Aljurf M, et al. COVID-19 associated with immune thrombocytopenia: a systematic review and meta-analysis. Expert Rev Hematol. 2022 Feb 1; 15(2): 157–66.
29. Savioli F, Claro M, da Silva Ramos FJ, Pastore L. Factor VIII, Fibrinogen and Heparin Resistance in COVID-19 Patients with Thromboembolism: How Should We Manage the Anticoagulation Therapy? Clinical and Applied Thrombosis/Hemostasis. 2022 Jan 21; 28.
30. Jasiczek J, Doroszko A, Trocha T, Trocha M. Role of the RAAS in mediating the pathophysiology of COVID-19. Pharmacological Reports. 2024 Jun 23; 76(3): 475–86.
31. Recchia Luciani G, Barilli A, Visigalli R, Dall'Asta V, Rotoli BM. Cytokines from SARS-CoV-2 Spike-Activated Macrophages Hinder Proliferation and Cause Cell Dysfunction in Endothelial Cells. Biomolecules. 2024 Jul 30; 14(8): 927.
32. Martora F, Villani A, Fabbrocini G, Battista T. <sc>COVID</sc> -19 and cutaneous manifestations: A review of the published literature. J Cosmet Dermatol. 2023 Jan 7; 22(1): 4–10.
33. Alshiyab DM, Al-qarqaz FA, Alhaje E, Mayou JA, Jaradat S, Asaad A, et al. Skin Manifestations Among Patients Admitted with COVID-19: A Cross-Sectional Study at a University-Based Tertiary Hospital in Jordan. Clin Cosmet Investig Dermatol. 2023 May; Volume 16: 1331–40.
34. TY- JOUR AU- Paudel, Kiran AU- Aku, Ramamurthy AU- Gaurav, Sharma PY - 2022/04/01 SP- 203 EP - 213 T1- Analytical Review of Yakrit Vikar Mentioned in Ayurveda And Contemporary Medicine VL- 11 DO- 10.20959/wjpps20228-22713 ER.
35. Kasar N, Deole Y, Tiwari S. Systematic review of the concept of Yakrutotpatti (embryology of liver). AYU (An international quarterly journal of research in Ayurveda). 2014; 35(1):5.
36. Sadeghi Dousari A, Hosseininassab SS, Sadeghi Dousari F, Fuladvandi M, Satarzadeh N. The impact of COVID-19 on liver injury in various age. World J Virol. 2023 Mar 25; 12(2): 91–9.
37. Radzina M, Putrins DS, Micena A, Vanaga I, Kolesova O, Platkajis A, et al. <sc>Post-COVID</sc> -19 Liver Injury: Comprehensive Imaging with Multiparametric Ultrasound. Journal of Ultrasound in Medicine. 2022 Apr 9; 41(4): 935–49.
38. Shih AR, Hatipoglu D, Wilechansky R, Goiffon R, Deshpande V, Misdraji J, et al. Persistent Cholestatic Injury and Secondary Sclerosing Cholangitis in COVID-19 Patients. Arch Pathol Lab Med. 2022 Oct 1; 146(10): 1184–93.
39. Kolesova O, Vanaga I, Laivacuma S, Derovs A, Kolesovs A, Radzina M, et al. Intriguing findings of liver fibrosis following COVID-19. BMC Gastroenterol. 2021 Dec 11; 21(1): 370.
40. Pirisi M, Rigamonti C, D'Alfonso S, Nebuloni M, Fanni D, Gerosa C, Orrù G, Venanzi Rullo E, Pavone P, Faa G, Saba L, Boldorini R. Liver infection and COVID-19: the electron microscopy proof and revision of the literature. Eur Rev Med Pharmacol Sci. 2021 Feb; 25(4): 2146–2151. doi: 10.26355/eurrev_202102_25120. PMID: 33660834.
41. Cooper S, Tobar A, Konen O, Orenstein N, Kropach Gilad N, Landau YE, et al. Long COVID-19 Liver Manifestation in Children. J Pediatr Gastroenterol Nutr. 2022 Sep 9; 75(3): 244–51.

Cite this article as:

C Devaki Krishna, Vidula Gujjarwar. Yakrut Karma in Post-Covid Sequelae: An Integrative Review. AYUSHDHARA, 2025;12(5):148-153.

<https://doi.org/10.47070/ayushdhara.v12i5.2310>

Source of support: Nil, Conflict of interest: None Declared

***Address for correspondence**

Dr. C Devaki Krishna

PG Scholar,

Department of Roga Nidana

Chaudhary Brahm Prakash

Ayurveda Charak Sansthan,

Najafgarh, New Delhi.

Email: drdevakikrishna@gmail.com

Disclaimer: AYUSHDHARA is solely owned by Mahadev Publications - A non-profit publications, dedicated to publish quality research, while every effort has been taken to verify the accuracy of the content published in our Journal. AYUSHDHARA cannot accept any responsibility or liability for the articles content which are published. The views expressed in articles by our contributing authors are not necessarily those of AYUSHDHARA editor or editorial board members.