International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Therapeutic Potential of Arogyavardhini Vati in Non-Alcoholic Fatty Liver Disease: An Ayurvedic Perspective and Contemporary Scientific Review

Dr. Sakshi Chahar[1], Dr. Abhishek Upadhyay[2], Dr. Pravin Shamrao Sawant[3], Dr. Daleep Kumar[4], Dr. Neha Khandelwal[5]

[1,4,5]P.G. Scholar, Kayachikitsa, National Institute of Ayurveda Jaipur 302002
[2]Assistant Professor, Kayachikitsa, National Institute of Ayurveda Jaipur 302002
[3]Assosiate Professor, Kayachikitsa, National Institute of Ayurveda Jaipur 302002

Abstract

Non-Alcoholic Fatty Liver Disease (NAFLD) is one of the most common chronic liver disorders worldwide and is considered the hepatic manifestation of metabolic syndrome. It is characterized by excessive fat accumulation in the liver without significant alcohol consumption and is closely associated with obesity, insulin resistance, diabetes, dyslipidemia, and sedentary lifestyle. Despite its increasing prevalence, specific pharmacological treatment options remain limited.

In Ayurveda, NAFLD can be understood through the concepts of Agnimandya, Ama, Meda Dhatu Dushti, Kapha-Pitta imbalance, and Yakrit Vikara. Arogyavardhini Vati, a classical herbo-mineral formulation, is traditionally indicated for liver disorders, metabolic dysfunction, and digestive impairment. Its ingredients, including Katuki, Guggulu, Triphala, Neem, Chitraka, Shilajit, Loha Bhasma, Tamra Bhasma, and Abhraka Bhasma, possess hepatoprotective, antioxidant, anti-inflammatory, and hypolipidemic properties.

This review aims to evaluate the therapeutic potential of Arogyavardhini Vati in the management of NAFLD by correlating Ayurvedic principles with available scientific evidence. Current studies suggest beneficial effects on liver function and lipid metabolism; however, further well-designed clinical trials are needed to establish its efficacy and safety.

Keywords: Arogyavardhini Vati, Non-Alcoholic Fatty Liver Disease, NAFLD, Ayurveda, Hepatoprotective Activity, Fatty Liver, Metabolic Disorders.

Introduction

Non-alcoholic fatty liver disease (NAFLD) is the most common chronic liver disease worldwide and is regarded as the hepatic manifestation of metabolic syndrome. It is characterized by excessive fat accumulation in the liver in individuals with little or no alcohol consumption and ranges from simple steatosis to non-alcoholic steatohepatitis (NASH), fibrosis, cirrhosis, and hepatocellular carcinoma.[1]The rising prevalence of obesity, type 2 diabetes mellitus, dyslipidaemia, insulin resistance, and sedentary lifestyle has made NAFLD a major global health concern.[3] Lifestyle modification remains the primary

treatment; however, long-term adherence is often difficult, and no universally approved pharmacological therapy is currently available.[4]

According to Ayurveda, although NAFLD is not described as a distinct disease, it can be correlated with Agnimandya, Ama, Meda Dhatu Dushti, Kapha-Pitta imbalance, and Yakrit Vikara. Impaired Agni leads to Ama formation, disturbed fat metabolism, and dysfunction of the liver (Yakrit), which is closely associated with Ranjaka Pitta and metabolic regulation[5].

Among the classical Ayurvedic formulations, Arogyavardhini Vati is traditionally indicated for liver disorders, metabolic disturbances, and digestive dysfunctions. It possesses Deepana, Pachana, Lekhana, and Medohara properties, making it a potential therapeutic option for metabolic liver diseases. The formulation contains Katuki (Picrorhiza kurroa), Guggulu (Commiphora mukul), Triphala, Nimba (Azadirachta indica), Shilajit, and mineral preparations such as Loha Bhasma, Tamra Bhasma, and Abhraka Bhasma. Experimental and clinical studies have demonstrated hepatoprotective, antioxidant, anti-inflammatory, hypolipidemic, and metabolic regulatory activities of these ingredients[6].

Considering the increasing burden of NAFLD and the limitations of current treatment options, Arogyavardhini Vati offers a promising Ayurvedic approach. This review aims to evaluate its classical basis, pharmacological properties, available experimental and clinical evidence, and potential role in the management of NAFLD.

Objectives

1. To review the Ayurvedic concept of NAFLD.
2. To evaluate the therapeutic potential of Arogyavardhini Vati in NAFLD.
3. To assess the pharmacological and clinical evidence supporting its use.
4. To explore its possible mechanisms of action.
5. To identify research gaps and future prospects.

Materials and Methods:

This narrative review was based on classical Ayurvedic texts and contemporary scientific literature related to Arogyavardhini Vati and Non-Alcoholic Fatty Liver Disease (NAFLD). Relevant information was collected from Ayurvedic classics and electronic databases using keywords such as Arogyavardhini Vati, NAFLD, fatty liver, hepatoprotective activity, Ayurveda, Picrorhiza kurroa, Commiphora mukul, and Triphala. Experimental studies, clinical studies, and review articles were analyzed to evaluate the pharmacological properties and therapeutic potential of Arogyavardhini Vati in the management of NAFLD.

Modern Understanding of Non-Alcoholic Fatty Liver Disease (NAFLD):

Non-alcoholic fatty liver disease (NAFLD) is characterized by excessive fat accumulation in the liver (>5% of hepatocytes) in the absence of significant alcohol consumption or other secondary causes of hepatic steatosis[10]. It comprises two major forms:

- Simple Hepatic Steatosis (NAFL): Fat accumulation in hepatocytes without significant inflammation or liver injury.
- Non-Alcoholic Steatohepatitis (NASH): Hepatic steatosis associated with inflammation, hepatocyte injury, and fibrosis, which may progress to cirrhosis and hepatocellular carcinoma.

Disease progression:
Simple Steatosis → NASH → Fibrosis → Cirrhosis → Hepatocellular Carcinoma
Early diagnosis and appropriate management are essential to prevent disease progression.

Epidemiology
NAFLD is the most common chronic liver disease worldwide, affecting nearly one-fourth of the adult population. Its prevalence is increasing due to obesity, type 2 diabetes, metabolic syndrome, and sedentary lifestyles[11].
The disease is rapidly rising in both developed and developing countries, including India, owing to urbanization and lifestyle changes[12]. In India, NAFLD is strongly associated with obesity, diabetes, and metabolic syndrome and is increasingly seen in younger adults[13]. It is now considered a systemic metabolic disorder because of its close association with insulin resistance and cardiovascular disease[14].

Risk Factors
The development of NAFLD is influenced by multiple metabolic and lifestyle factors. Obesity, particularly visceral obesity, promotes hepatic fat accumulation and insulin resistance. Insulin resistance and type 2 diabetes mellitus play a central role by increasing the delivery of free fatty acids to the liver. Dyslipidemia, characterized by elevated triglycerides and LDL with reduced HDL, further contributes to hepatic steatosis[15].
NAFLD is closely associated with metabolic syndrome, including obesity, hypertension, hyperglycemia, and dyslipidemia. In addition, sedentary lifestyle, high-calorie and processed food intake, excessive refined carbohydrates, and sleep disturbances significantly increase the risk of disease development and progression.

Pathogenesis of NAFLD
Pathogenesis
The pathogenesis of NAFLD is multifactorial, involving insulin resistance, hepatic lipid accumulation, oxidative stress, mitochondrial dysfunction, inflammation, and alterations in the gut–liver axis[16].
Insulin resistance increases free fatty acid delivery to the liver, leading to excessive triglyceride accumulation and hepatic steatosis. Disturbance in lipid metabolism further promotes fat deposition in hepatocytes[17]. Excess lipid accumulation generates oxidative stress and mitochondrial dysfunction, resulting in hepatocellular injury[18]. Chronic inflammation mediated by cytokines, including TNF-α and interleukins, contributes to the progression from simple steatosis to NASH and fibrosis[19]. Additionally, alterations in the gut–liver axis and intestinal microbiota promote hepatic inflammation and metabolic dysfunction[20].

Clinical Features of NAFLD
NAFLD is often asymptomatic, particularly during the early stages of the disease, and many patients are diagnosed incidentally during routine health examinations or imaging studies.Some patients may present with nonspecific symptoms such as fatigue, general weakness, reduced physical endurance, mild discomfort in the right upper abdomen, and abdominal heaviness.[21] Hepatomegaly may be observed in some individuals due to hepatic fat accumulation.[22] With progression to advanced fibrosis or cirrhosis, patients may develop features of chronic liver disease, including ascites, jaundice, portal hypertension,

and impaired liver function.[23]

Diagnosis and Complications

The diagnosis of NAFLD is based on a combination of clinical evaluation, biochemical investigations, and imaging modalities to confirm hepatic steatosis and assess disease severity. Liver function tests may demonstrate mild elevations in ALT, AST, and GGT; however, normal enzyme levels do not rule out NAFLD.[24] Abdominal ultrasonography is the commonly used first-line imaging technique for detecting hepatic fat accumulation, whereas FibroScan (transient elastography) provides a non-invasive assessment of liver stiffness and fibrosis risk.[25,26] Liver biopsy remains the gold standard for differentiating simple steatosis from NASH and evaluating inflammation, hepatocellular injury, and fibrosis, although its invasive nature limits routine application.[27]

NAFLD has a progressive disease spectrum, ranging from simple steatosis to NASH, fibrosis, cirrhosis, and hepatocellular carcinoma[28–30]. Persistent inflammation and fibrosis increase the risk of advanced liver complications. Additionally, NAFLD is closely associated with cardiovascular disease, type 2 diabetes mellitus, and metabolic syndrome, emphasizing its role as a systemic metabolic disorder rather than merely a liver-specific condition[31].

Ayurvedic Perspective of Fatty Liver Disease (NAFLD)

Although the term Non-Alcoholic Fatty Liver Disease (NAFLD) is not directly mentioned in classical Ayurvedic texts, the pathological changes associated with fatty liver can be understood through Ayurvedic concepts such as Agnimandya (impaired metabolic function), Ama formation, Meda Dhatu Dushti (disturbance of fat metabolism), and Kapha Dosha aggravation. The concept of impaired Agni leading to improper metabolism and accumulation of abnormal metabolites is described in Charaka Samhita.[32]

Ayurveda explains disease development through the imbalance of Dosha, Dhatu, Agni, and Srotas, resulting in disturbance of tissue metabolism and physiological functions. The concepts of Dhatu Dushti and Srotodushti described in classical texts can be correlated with metabolic disturbances observed in NAFLD.[33]

The role of Yakrit (liver) in metabolic transformation and the functions of Pitta, particularly Ranjaka Pitta, are described in Ayurvedic literature and may be correlated with hepatic metabolic functions.[34]

Concept of Yakrit (Liver) in Ayurveda

In Ayurveda, Yakrit (liver) is considered a vital organ involved in metabolism and Rakta Dhatu formation through Ranjaka Pitta.[35] The balance of Agni, Dosha, Dhatu, and Srotas maintains normal physiology, while their disturbance leads to disease.[36] Liver disorders are described under Yakrit Vikara, and NAFLD can be correlated with Agnimandya, Meda Dhatu Dushti, Kapha predominance, and impaired hepatic metabolism.[37,38].

Ayurvedic Understanding of Metabolic Disturbances in NAFLD

In Ayurveda, Yakrit (liver) is associated with metabolic transformation and the function of Ranjaka Pitta, which plays an important role in Rakta Dhatu formation[39]. Impairment of Agni (Agnimandya) results in improper metabolism and Ama formation, leading to disturbance of tissue functions and Srotas[40,41].

The pathogenesis of NAFLD can be conceptually correlated with Agnimandya, Ama accumulation, Kapha predominance, and Meda Dhatu Dushti. Excessive intake of Guru, Snigdha, Madhura Ahara and sedentary

lifestyle contribute to impaired metabolism and abnormal fat accumulation. Disturbed Meda metabolism and Srotorodha may correspond with hepatic lipid deposition and metabolic dysfunction observed in NAFLD.

From an Ayurvedic perspective, NAFLD may be understood through related concepts such as Medoroga, Sthaulya, and Yakrit Vikara, involving derangement of fat metabolism and hepatic function. This provides a basis for evaluating formulations like Arogyavardhini Vati in metabolic liver disorders.

Samprapti (Pathogenesis) of Fatty Liver Disease According to Ayurveda[42]

Nidana Sevana (etiological factors)

↓

Excessive Guru, Snigdha, Madhura Ahara + sedentary lifestyle

↓

Agnimandya (impaired metabolism)

↓

Ama formation

↓

Kapha Dosha aggravation

↓

Meda Dhatu Dushti

↓

Srotorodha (channel obstruction)

↓

Accumulation of fat and metabolic disturbance in Yakrit

↓

Yakrit Vikara (fatty liver condition)

Samprapti Ghataka

Dosha	Kapha predominant with involvement of Pitta
Dushya	Meda Dhatu, Rakta Dhatu
Agni	Mandagni
Ama	Present
Srotas	Medovaha, Rasavaha, Raktavaha
Srotodushti	Sanga (obstruction)
Adhisthana	Yakrit (liver)
Roga Marga	Abhyantara Marga

Ayurvedic Rationale of Arogyavardhini Vati in NAFLD

Arogyavardhini Vati is considered beneficial in metabolic and hepatic disorders due to its classical properties:

- **Deepana:** Improves digestive strength
- **Pachana:** Helps in metabolism of Ama
- **Lekhana:** Helps reduce excessive accumulation of Meda
- **Medohara:** Supports healthy fat metabolism

- **Yakrit supportive action:** Helps maintain liver function

Thus, from an Ayurvedic perspective, Arogyavardhini Vati may act by correcting Agni dysfunction, reducing Ama accumulation, balancing Kapha-Meda pathology, and supporting Yakrit function.

Arogyavardhini Vati: Classical Review[43]

Arogyavardhini Vati is a classical Ayurvedic herbo-mineral (Rasaushadhi) formulation used for disorders related to metabolic impairment, liver dysfunction, digestive disturbances, and abnormal tissue accumulation. The term Arogyavardhini denotes, that which promotes health indicating its role in maintaining physiological balance.

Traditionally, it is indicated in conditions such as Kamala, Yakrit Vikara, Pandu, Medoroga, Kushtha, and Mandagni. Its therapeutic effects are attributed to the synergistic action of its herbal and mineral components, which support Agni, metabolism, hepatic function, and tissue homeostasis.

Composition of Arogyavardhini Vati:

S. No.	Ingredients	Botanical Name	Amount
1.	Shuddha Parad	-	1 Part
2.	Shuddha Gandhaka	-	1 Part
3.	Loha Bhasma	-	1 Part
4.	Abhraka Bhasma	-	1 Part
5.	Tamra Bhasma	-	1 Part
6.	Triphala • Haritaki- (Chebulic Myrobalan fruit rind) • Bibhitaki- (Belliric Myrobalan fruit rind) • Amalaki- (Indian gooseberry fruit)	 • Terminalia chebula • Terminalia bellirca • Emblica officinalis	2 Part
7.	Shilajatu (Minreral Pitch)	Asphaltum	3 Part
8.	Guggulu (Indian bedelium / gum resin)	Comiphora mukul	4 Part
9.	Chitramoola – (The root of indian led word)	Plumbago Zeylnica	4 Part
10.	Tikta – (Katuki)	Picrorhiza kurroa	4 Part
11.	Juice extract of Nimba Leaf - Neema	Azadirachta indica	Quantity as per need

Ayurvedic Pharmacodynamics and Therapeutic Significance of Arogyavardhini Vati

The pharmacological actions of Ayurvedic formulations are explained through the principles of Rasa, Guna, Virya, Vipaka, and Karma. Arogyavardhini Vati predominantly exhibits Tikta, Katu, and Kashaya Rasa along with Laghu, Ruksha, and Tikshna Guna, contributing to Deepana, Pachana, Lekhana, and Kapha-Medohara actions. Its Ushna Virya and Katu Vipaka enhance Agni, support metabolic transformation, and help regulate excessive Meda accumulation. These properties explain its traditional application in hepatic and metabolic disorders, including conditions associated with fatty liver.

Traditionally, Arogyavardhini Vati is indicated in Yakrit Vikara, Kamala, Pandu, Medoroga, Sthaulya, Kushtha, and Mandagni. Its Deepana-Pachana activity helps improve digestion and metabolism, while Lekhana and Medohara actions support the management of abnormal fat accumulation. The formulation's influence on Agni, Ama, Kapha, and Meda metabolism provides a conceptual basis for its role in NAFLD management.

The multi-component formulation may exert beneficial effects through correction of Agnimandya, Ama accumulation, Meda Dhatu Dushti, and metabolic imbalance. Additionally, ingredients such as Katuki (Picrorhiza kurroa) and Guggulu (Commiphora mukul) have demonstrated hepatoprotective, antioxidant, anti-inflammatory, and lipid-regulating activities, supporting the possible therapeutic relevance of Arogyavardhini Vati in metabolic liver disorders.

Pharmacological Properties of Individual Ingredients of Arogyavardhini Vati Relevant to NAFLD

Arogyavardhini Vati is a classical polyherbo-mineral formulation containing multiple bioactive components with hepatoprotective, antioxidant, anti-inflammatory, hypolipidemic, and metabolic regulatory properties. The synergistic actions of its ingredients provide a potential therapeutic basis for its use in metabolic liver disorders such as Non-Alcoholic Fatty Liver Disease (NAFLD).

Katuki (Picrorhiza kurroa) is an important Ayurvedic hepatoprotective drug traditionally indicated in Kamala and Yakrit Vikara. It possesses Tikta Rasa, Laghu Guna, and Ushna Virya with Deepana, Pachana, Bhedana, and hepatoprotective actions. Its active constituents, mainly picroside-I and picroside-II, exhibit antioxidant and anti-inflammatory effects, reduce oxidative stress, protect hepatocytes, and improve liver function parameters[44]. Its role in regulating lipid metabolism supports its relevance in NAFLD management.

Guggulu (Commiphora mukul) is traditionally used in conditions associated with Meda Dushti, obesity, and lipid imbalance due to its Lekhana, Medohara, and Kapha Shamaka properties. The active compounds, particularly guggulsterones, demonstrate lipid-lowering, antioxidant, and anti-inflammatory activities by improving lipid profiles and reducing inflammatory mediators involved in NAFLD progression[45].

Triphala, comprising Haritaki (Terminalia chebula), Bibhitaki (Terminalia bellirica), and Amalaki (Phyllanthus emblica), possesses antioxidant, anti-inflammatory, digestive, and metabolic regulatory effects. Its rich polyphenolic content helps reduce oxidative stress, enhance antioxidant defense, and support hepatic function[46], which may be beneficial in preventing progression from steatosis to NASH.

Nimb (Azadirachta indica) possesses Tikta Rasa, detoxifying, anti-inflammatory, and metabolic balancing properties. Modern studies have demonstrated its antioxidant, hepatoprotective, and glucose-regulating effects[47], which may help reduce oxidative damage and metabolic abnormalities associated with NAFLD.

Chitraka (Plumbago zeylanica) is a potent Deepana-Pachana drug traditionally used to improve digestion and metabolism. Its active constituent plumbagin exhibits antioxidant and anti-inflammatory activities, supporting correction of Agnimandya and metabolic dysfunction associated with fatty liver[48].

Shilajit (Asphaltum) is a mineral-origin Rasayana drug containing fulvic acid and bioactive compounds. It exhibits antioxidant, anti-inflammatory, adaptogenic, and mitochondrial-supportive properties. Since mitochondrial dysfunction contributes to NAFLD progression, Shilajit may support hepatic energy metabolism and cellular function[49].

The mineral components Loha Bhasma, Tamra Bhasma, and Abhraka Bhasma[50–52] undergo classical Shodhana and Marana processes to enhance their therapeutic properties. Loha Bhasma is traditionally associated with tissue metabolism, Tamra Bhasma with digestive and metabolic functions, and Abhraka Bhasma with rejuvenative effects. However, proper preparation, standardization, and quality control are essential to ensure safety and therapeutic efficacy.

Overall, the diverse pharmacological actions of Arogyavardhini Vati ingredients suggest a multi-target approach involving regulation of lipid metabolism, reduction of oxidative stress, modulation of inflammation, and improvement of hepatic function, supporting its potential role in NAFLD management.

Experimental and Clinical Evidence of Arogyavardhini Vati

Experimental studies on individual ingredients of Arogyavardhini Vati, including Katuki, Guggulu, Triphala, and Nimb, have demonstrated hepatoprotective, antioxidant, anti-inflammatory, and lipid-regulating effects. Animal and laboratory studies have reported reduction in liver enzyme elevation, protection against hepatic injury, improvement in antioxidant defense, reduction of lipid peroxidation, and regulation of lipid metabolism[53]. However, direct experimental evaluation of the complete formulation in NAFLD models remains limited.

Clinical use of Arogyavardhini Vati in hepatic and metabolic disorders has shown potential improvement in liver function parameters, digestive symptoms, lipid abnormalities, and metabolic status. Nevertheless, evidence specifically supporting its efficacy in NAFLD is insufficient, and further well-designed clinical trials with standardized formulations and objective outcome measures are required.

Safety and Toxicological Considerations

As Arogyavardhini Vati contains processed mineral components, its safety depends on proper pharmaceutical preparation and quality control. Classical Ayurvedic procedures such as Shodhana (purification) and Marana (incineration) are essential to ensure the safety and therapeutic efficacy of mineral ingredients. Standardization of the formulation, assessment of heavy metal content, appropriate dosage, and monitoring during long-term use are important considerations for clinical practice. Formulations prepared according to classical Ayurvedic guidelines and good manufacturing practices are considered safer than improperly manufactured products, highlighting the need for rigorous quality assurance and standardization.

Limitations and Future Perspectives

Despite its promising therapeutic potential in NAFLD, the current evidence on Arogyavardhini Vati remains limited. Available studies are few in number, with a lack of large-scale randomized controlled trials and standardized formulations. In addition, limited evidence exists regarding its molecular mechanisms of action and long-term safety. These limitations underscore the need for well-designed experimental and clinical studies to establish its efficacy, safety, and therapeutic role in the management of NAFLD.

Future Research Perspectives

Future research should focus on well-designed randomized controlled trials to evaluate the efficacy of Arogyavardhini Vati in NAFLD. Emphasis should also be placed on formulation standardization, quality control, pharmacokinetic and pharmacodynamic studies, elucidation of molecular mechanisms, and long-term safety evaluation. Comparative studies with conventional therapies may further clarify its clinical utility. Integrating classical Ayurvedic principles with modern scientific research will help strengthen the evidence base and facilitate the rational use of Arogyavardhini Vati in the management of metabolic liver disorders.

Discussion

Non-Alcoholic Fatty Liver Disease (NAFLD) is a major global metabolic disorder closely associated with obesity, insulin resistance, diabetes mellitus, dyslipidemia, and sedentary lifestyle. Its pathogenesis involves excessive hepatic lipid accumulation, oxidative stress, mitochondrial dysfunction, inflammation,

and fibrosis. Although lifestyle modification remains the cornerstone of management, poor long-term adherence and the absence of approved pharmacological therapies have increased interest in safe and holistic treatment approaches.

From an Ayurvedic perspective, NAFLD can be correlated with Agnimandya, Ama formation, Meda Dhatu Dushti, Kapha predominance, and Yakrit Vikara. These concepts reflect impaired metabolism, abnormal tissue transformation, and disturbed physiological pathways, which closely parallel the modern understanding of metabolic dysfunction and hepatic steatosis. Arogyavardhini Vati, a classical polyherbo-mineral formulation, has traditionally been indicated for hepatic dysfunction, metabolic disorders, and digestive impairment.

The pharmacological potential of Arogyavardhini Vati is attributed to the synergistic actions of its ingredients. Katuki exhibits hepatoprotective and antioxidant effects, Guggulu possesses lipid-lowering and anti-inflammatory properties, while Triphala and Nimb provide antioxidant and metabolic regulatory activities. Together, these actions may help improve lipid metabolism, reduce oxidative stress and inflammation, and support hepatic function. From an Ayurvedic standpoint, its Deepana, Pachana, Lekhana, and Medohara properties further justify its potential role in metabolic liver disorders.

Despite these promising findings, the available evidence is limited, with most studies focusing on individual ingredients rather than the complete formulation. The lack of large-scale randomized controlled trials, standardized formulations, and long-term safety data limits definitive conclusions regarding its efficacy. Furthermore, the presence of mineral components necessitates proper Shodhana, standardization, quality control, and safety evaluation. Overall, Arogyavardhini Vati represents a promising multi-target Ayurvedic formulation for NAFLD. However, well-designed experimental and clinical studies are needed to establish its efficacy, safety, and evidence-based role in the management of NAFLD.

Conclusion

Non-Alcoholic Fatty Liver Disease is a rapidly increasing metabolic disorder characterized by hepatic fat accumulation, oxidative stress, inflammation, and risk of progressive liver damage. Ayurveda provides a holistic understanding of such metabolic disturbances through concepts related to impaired metabolism, tissue imbalance, and hepatic dysfunction.

Arogyavardhini Vati is a classical herbo-mineral formulation with potential hepatoprotective, antioxidant, anti-inflammatory, and lipid-regulating properties. The combined actions of its herbal and mineral constituents suggest its possible role in addressing multiple mechanisms involved in NAFLD progression. Although traditional use and available experimental evidence indicate promising therapeutic potential, current scientific evidence is insufficient to confirm its definitive clinical efficacy in NAFLD. Further studies involving standardized formulations, controlled clinical trials, molecular investigations, and long-term safety evaluation are necessary.

Arogyavardhini Vati may represent a valuable area of research in integrative approaches for metabolic liver disorders, where Ayurvedic principles and modern scientific methodologies can be combined to develop evidence-based therapeutic strategies.

References

1. 1.Ahmed A, Wong RJ, Harrison SA. Nonalcoholic fatty liver disease review: diagnosis, treatment, and outcomes. Clin Gastroenterol Hepatol. 2015;13(12):2062–2070. doi: 10.1016/j.cgh.2015.07.029.

2. 2.Machado MV, Diehl AM. Pathogenesis of nonalcoholic Steatohepatitis. Gastroenterology. 2016;150(8):1769–1777. doi: 10.1053/j.gastro.2016.02.066.
3. 3.Nasr P, Ignatova S, Kechagias S, Ekstedt M. Natural history of nonalcoholic fatty liver disease: a prospective follow-up study with serial biopsies. Hepatol Commun. 2018;2(2):199–210. doi: 10.1002/hep4.1134.
4. 4.Younossi Z, Anstee QM, Marietti M, Hardy T, Henry L, Eslam M, et al. Global burden of NAFLD and NASH: trends, predictions, risk factors and prevention. Nat Rev Gastroenterol Hepatol. 2018;15(1):11–20. doi: 10.1038/nrgastro.2017.109.
5. 5.Browning JD, Szczepaniak LS, Dobbins R, Nuremberg P, Horton JD, Cohen JC, et al. Prevalence of hepatic steatosis in an urban population in the United States: impact of ethnicity. Hepatology (Baltimore, Md) 2004;40(6):1387–1395. doi: 10.1002/hep.20466.
6. 6.Chalasani N, Younossi Z, Lavine JE, Diehl AM, Brunt EM, Cusi K, et al. The diagnosis and management of non-alcoholic fatty liver disease: practice guideline by the American Gastroenterological Association, American Association for the Study of Liver Diseases, and American College of Gastroenterology. Gastroenterology. 2012;142(7):1592–1609. doi: 10.1053/j.gastro.2012.04.001.
7. 7.Dixon JB, Bhathal PS, O'Brien PE. Nonalcoholic fatty liver disease: predictors of nonalcoholic steatohepatitis and liver fibrosis in the severely obese. Gastroenterology. 2001;121(1):91–100. doi: 10.1053/gast.2001.25540.
8. 8.Clark JM, Brancati FL, Diehl AM. The prevalence and etiology of elevated aminotransferase levels in the United States. Am J Gastroenterol. 2003;98(5):960–967. doi: 10.1111/j.1572-0241.2003.07486.x.
9. 9.Edmison J, McCullough AJ. Pathogenesis of non-alcoholic steatohepatitis: human data. Clin Liver Dis. 2007;11(1):75–104, ix. doi: 10.1016/j.cld.2007.02.011.
10. Roushan R, Moharana P. Ranjak pitta and its affiliates in modern perspective: A review. Journal of Advanced Scientific Research. 2019;10(3 Suppl 1):124-130.
11. Younossi ZM, Anstee QM, Marietti M, Hardy T, Henry L, Eslam M, et al. Global burden of NAFLD and NASH: trends, predictions, risk factors and prevention. Nat Rev Gastroenterol Hepatol. 2018;15(1):11-20.
12. Younossi ZM, Koenig AB, Abdelatif D, Fazel Y, Henry L, Wymer M. Global epidemiology of nonalcoholic fatty liver disease—Meta-analytic assessment of prevalence, incidence, and outcomes. Hepatology. 2016;64(1):73-84.
13. 13.Duseja A. Nonalcoholic fatty liver disease in India – A lot done, yet more required. Indian J Gastroenterol. 2010;29(6):217-225.
14. 14.Chalasani N, Younossi Z, Lavine JE, Charlton M, Cusi K, Rinella M, et al. The diagnosis and management of nonalcoholic fatty liver disease: Practice Guidance from the American Association for the Study of Liver Diseases. Hepatology. 2018;67(1):328-357.
15. Kumar G, Srivastava A, Sharma SK, Gupta YK. Safety and efficacy evaluation of Ayurvedic treatment (Arjuna powder and Arogyavardhini Vati) in dyslipidemia patients: A pilot prospective cohort clinical study. Ayu. 2012;33(2):197-201. doi:10.4103/0974-8520.105238. PMID:23559790; PMCID:PMC3611635.
16. Machado MV, Diehl AM. Pathogenesis of nonalcoholic steatohepatitis. Gastroenterology. 2016;150(8):1769-1777. doi:10.1053/j.gastro.2016.02.066.

17. 17.Tilg H, Moschen AR. Evolution of inflammation in nonalcoholic fatty liver disease: the multiple parallel hits hypothesis. Hepatology. 2010;52(5):1836-1846. doi:10.1002/hep.24001.
18. 18.Begriche K, Igoudjil A, Pessayre D, Fromenty B. Mitochondrial dysfunction in NASH: causes, consequences and possible means to prevent it. Mitochondrion. 2006;6(1):1-28. doi:10.1016/j.mito.2005.10.004.
19. 19.Friedman SL, Neuschwander-Tetri BA, Rinella M, Sanyal AJ. Mechanisms of NAFLD development and therapeutic strategies. Nat Med. 2018;24(7):908-922. doi:10.1038/s41591-018-0104-9.
20. 20.Aron-Wisnewsky J, Vigliotti C, Witjes J, Clément K. Gut microbiota and human NAFLD: disentangling microbial signatures from causality. Nat Rev Gastroenterol Hepatol. 2020;17:279-297. doi:10.1038/s41575-020-0269-9.
21. 21.Rinella ME. Nonalcoholic fatty liver disease: a systematic review. JAMA. 2015;313(22):2263-2273. doi:10.1001/jama.2015.5370.
22. 22.Ahmed A, Wong RJ, Harrison SA. Nonalcoholic fatty liver disease review: diagnosis, treatment, and outcomes. Clinical Gastroenterology and Hepatology. 2015;13(12):2062-2070. doi:10.1016/j.cgh.2015.07.029.
23. 23.Chalasani N, Younossi Z, Lavine JE, Charlton M, Cusi K, Rinella M, et al. The diagnosis and management of nonalcoholic fatty liver disease: Practice Guidance from the American Association for the Study of Liver Diseases. Hepatology. 2018;67(1):328-357. doi:10.1002/hep.29367.
24. Chalasani N, Younossi Z, Lavine JE, Charlton M, Cusi K, Rinella M, et al. The diagnosis and management of nonalcoholic fatty liver disease: Practice Guidance from the American Association for the Study of Liver Diseases. Hepatology. 2018;67(1):328-357.
25. 25.Rinella ME. Nonalcoholic fatty liver disease: a systematic review. JAMA. 2015;313(22):2263-2273.
26. 26.Castera L, Friedrich-Rust M, Loomba R. Noninvasive assessment of liver disease in patients with nonalcoholic fatty liver disease. Gastroenterology. 2019;156(5):1264-1281.
27. Kleiner DE, Brunt EM, Van Natta M, Behling C, Contos MJ, Cummings OW, et al. Design and validation of a histological scoring system for nonalcoholic fatty liver disease. Hepatology. 2005;41(6):1313-1321.
28. 28.Machado MV, Diehl AM. Pathogenesis of nonalcoholic steatohepatitis. Gastroenterology. 2016;150(8):1769-1777.
29. 29.Friedman SL, Neuschwander-Tetri BA, Rinella M, Sanyal AJ. Mechanisms of NAFLD development and therapeutic strategies. Nature Medicine. 2018;24(7):908-922.
30. Mittal S, El-Serag HB, Sada YH, Kanwal F, Duan Z, Temple S, et al. Hepatocellular carcinoma in patients with non-alcoholic fatty liver disease. Hepatology. 2016;63(3):848-857.
31. 31.Targher G, Byrne CD. NAFLD: a novel cardiometabolic risk factor for type 2 diabetes and cardiovascular disease. Diabetologia. 2013;56:1951-1959.
32. Agnivesha. Charaka Samhita. Revised by Charaka and Dridhabala with Ayurveda Dipika commentary of Chakrapani. Sutra Sthana, Chapter 28 (Vividha Ashitapitiya Adhyaya). Varanasi: Chaukhambha Prakashan.
33. Agnivesha. Charaka Samhita. Revised by Charaka and Dridhabala with Ayurveda Dipika commentary of Chakrapani. Vimana Sthana, Chapter 5 (Srotovimana Adhyaya). Varanasi: Chaukhambha Prakashan.

34. 33.Vagbhata. Ashtanga Hridaya. Sutra Sthana, Chapter 12 (Doshabhediya Adhyaya). Varanasi: Chaukhambha Sanskrit Sansthan.
35. 34.Vagbhata. Ashtanga Hridaya. Sutra Sthana, Chapter 12 (Doshabhediya Adhyaya). Varanasi: Chaukhambha Sanskrit Sansthan.
36. Agnivesha. Charaka Samhita. Revised by Charaka and Dridhabala, with Ayurveda Dipika commentary of Chakrapani. Sutra Sthana, Chapter 28 (Vividha Ashitapitiya Adhyaya). Varanasi: Chaukhambha Prakashan.
37. Agnivesha. Charaka Samhita. Revised by Charaka and Dridhabala, with Ayurveda Dipika commentary of Chakrapani. Vimana Sthana, Chapter 5 (Srotovimana Adhyaya). Varanasi: Chaukhambha Prakashan.
38. 37.Vagbhata. Ashtanga Hridaya. Nidana Sthana, Chapter 13 (Udara Nidana). Varanasi: Chaukhambha Sanskrit Sansthan.
39. 38.Agnivesha. Charaka Samhita. Revised by Charaka and Dridhabala, with Ayurveda Dipika commentary of Chakrapani. Sutra Sthana, Chapter 12 (Mahatigarbhavakranti Sharira/appropriate Pitta description depending on your edition) or Sutra Sthana, Chapter 20 (Maharoga Adhyaya). Varanasi: Chaukhambha Prakashan.
40. Roushan R, Moharana P. Ranjaka pitta and its affiliates in modern perspective: A review. J Adv Sci Res. 2019;10(3 Suppl 1):124-130. ISSN:0976-9595.
41. Shastri KB. Agnivesha, Charaka Samhita. Vol. 1. Varanasi: Chaukambha Bharti Academy; Sutra Sthana, Chapter 12, Verse 11.
42. Dwarikanath C., Introduction to Kayachikitsa, Chaukhanbha Orientalia, Varanasi, third edition, 1996; Page no. 69.
43. Agnivesha, Charaka, Dridhabala. Charaka Samhita. Edited by Yadavji Trikamji Acharya. Varanasi: Chaukhambha Surbharati Prakashan; 2011. Vimanasthana 5/3-8.
44. Govind Das Sen. Bhaishajya Ratnavali. Ambikadatta Shastri, editor. Varanasi: Chaukhambha Prakashan; 2014. Yakrit-Pliha Roga Chikitsa Adhyaya, Ch. 32, verses 25-33 (Arogyavardhini Vati).
45. Wajpeyi SM. Hepatoprotective and hypolipidemic effect of Kutaki (Picrorhiza kurroa Royle ex Benth.)-A review. International Journal of Research and Analytical Reviews. 2019;6(1):782-787.
46. Srivastava A, Marbate R. A review study on Navaka Guggulu and its probable mode of action in the management of Sthaulya. International Journal of AYUSH. 2020;9(3):439-450.
47. Rana S, Palatty PL, Benson R, Kochikuzhyil BM, Baliga MS. Evaluation of the anti-hyperlipidemic effects of Triphala in high fat diet fed rats: Studies with two combinations. Ayu. 2022;43(3):98-104. doi:10.4103/ayu.AYU_74_19. PMID:38075184; PMCID:PMC10710234.
48. Islas JF, Acosta E, Zuca G-Buentello R, Delgado-Gallegos JL, Moreno-Treviño MG, Escalante B, Moreno-Cuevas JE. An overview of Neem (Azadirachta indica) and its potential impact on health. J Funct Foods. 2020;74:104171. doi:10.1016/j.jff.2020.104171.
49. Shukla B, Saxena S, Usmani S, Kushwaha P. Phytochemistry and pharmacological studies of Plumbago zeylanica L.: a medicinal plant review. Clin Phytosci. 2021;7:34. doi:10.1186/s40816-021-00271-7.
50. Singh R, Kaushik S, Yadav P, Ruknuddin G, Prajapati PK. Research developments in immunomodulatory and antioxidant activities of Shilajatu. Indian Drugs. 2021;58(9):7-20. doi:10.53879/id.58.09.11977.

51. Anjali KV, Rajendra Prasad ML, Vasundhara S. Comprehensive study of Tamra Bhasma Pareeksha W.S.R. Nambhuri Phase Spot Test. J Chem Health Risks. 2025;15(5):2943-2953.
52. Anjali KV, Rajendra Prasad ML, Vasundhara S. Comprehensive study of Tamra Bhasma Pareeksha with special reference to Nambhuri Phase Spot Test. Journal of Chemical Health Risks. 2025;15(5):2943-2953.
53. Bajaj N, Mittal R, Antra. A review article on Abhrak Bhasma. World Journal of Pharmaceutical and Medical Research. 2025;11(4):221-224.
54. Kumar G, Srivastava A, Sharma SK, Gupta YK. Safety evaluation of an Ayurvedic medicine, Arogyavardhini vati on brain, liver and kidney in rats. J Ethnopharmacol. 2012 Mar 6;140(1):151-60. doi: 10.1016/j.jep.2012.01.004. Epub 2012 Jan 14. PMID: 22265750.