



Case Study

EFFECT OF AYURVEDIC INTERVENTIONS ON METABOLIC DYSFUNCTION-ASSOCIATED STEATOTIC LIVER DISEASE (YAKRIT VIKARA)

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Article info

Article History:

Received: 23-07-2026

Accepted: 20-08-2026

Published: 10-09-2026

KEYWORDS:

Ayurveda, Case Report, MASLD, NAFLD, Yakrit.

ABSTRACT

Non-alcoholic fatty liver disease (NAFLD), recently termed metabolic dysfunction-associated steatotic liver disease (MASLD), is a common metabolic liver disorder characterized by excessive hepatic fat accumulation and frequently associated with obesity, insulin resistance and dyslipidemia. Ayurveda offers an individualized approach to metabolic disorders through assessment of *Agni*, *Dosha*, *Meda Dhatu* and *Srotas*. In the present case study, a 50-year-old male patient presented with abdominal pain, irregular bowel movement and heaviness in abdomen and was diagnosed with metabolic dysfunction-associated steatotic liver disease based on clinical evaluation, biochemical investigations and ultrasonography. Fibroscan revealed moderate fibrosis. Ayurvedic assessment revealed *Agnimandya*, *Meda Dushti* and features suggestive of *Medovaha Srotodushti*. The patient was treated with an individualized Ayurvedic regimen comprising *Aarogyavardhini vati*, *Gokshuradi guggulu*, *Punarnava* formulations for four months. Following completion of treatment, there was improvement in clinical, biochemical and liver stiffness parameters. No adverse events were reported during the treatment period. This case highlights the potential role of an individualized Ayurvedic approach in the management of NAFLD/MASLD, integrating *Agni* and *Meda* assessment with pharmacological interventions.

INTRODUCTION

Affecting more than 30% of the global population, Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD), formerly known as nonalcoholic fatty liver disease (NAFLD) is a worldwide prevalent chronic liver disease associated with various cardiometabolic and environmental risk factors.^[1,2] It is caused by chronic fat accumulation in the liver and complex interactions involving metabolic dysregulation and insulin resistance. Diagnosis involves liver biopsy (gold standard), imaging tests like transient elastography or vibration-controlled transient elastography (Fibroscan), Ultrasound, and at least one of the cardiometabolic criteria.^[3]

MASLD is found to be associated with liver failure, cirrhosis, liver cancer and various metabolic dysfunction making early prevention a critical global priority.^[4] The main line of treatment is lifestyle modifications, weight loss and management of comorbid conditions.^[1]

In classical Ayurvedic texts, the condition of fatty liver may be correlated with *Santarpanjanya vikara*, *Medodushti*, *Medoroga* or *Yakrit vikara*. The main pathological event results from overnutrition and *Kapha-Meda* (adipose tissue) vitiation, accompanied by impaired *Agni* (digestive-metabolic fire) and *Srotodushti* (obstruction of bodily channels). The ancient text of *Yogratnakara* describes *Rakta-Kapha Dushti* leading to *Yakritodara* (enlargement of the liver). Management according to Ayurveda principles involve *Aptarpana chikitsa* and disrupting the disease's pathogenesis. The treatment aims to correct *Agni* (digestive fire), digest *Ama* (toxins), alleviate *Kapha*, and perform *Lekhana* (scraping) of accumulated *Medas* (fat).^[5]

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<https://doi.org/10.47070/ayushdharma.v13i4.2954>

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The present case highlights the effective Ayurveda treatment in a patient with grade 2 fatty liver.

Patient Information

A 50-year-old male patient, non-smoker, non-alcoholic presented with complaints of generalized body weakness, pedal edema, abdominal pain, irregular bowel movement and heaviness in abdomen after eating for 5 months. Abdominal ultrasonography findings revealed grade 2 fatty liver. Subsequent fibroscan confirmed the diagnosis. He was newly diagnosed with hypertension and dyslipidaemia but he was not taking any medication. The patient had vegetarian diet and sedentary lifestyle. He appeared fatigued and less energetic.

Timeline

Table 1: Timeline of the present case study

Date	Event	Findings
8 April 2026	Underwent ultrasonography of abdomen due to abdominal complaints after consulting a physician.	Grade 2 fatty liver
7 May 2026	First Liver vibration-controlled transient elastography (fibroscan).	Stiffness (kPa) - 9.4 UAP (Db/M) - 328 Suggesting moderate fibrosis.
8 May 2026	First visit at Ch. Brahm Prakash Ayurved Charak Sansthan.	Abdominal pain, irregular bowel movement and heaviness in abdomen after eating.
8 May to 25 August 2026	Treatment continued with 15 days follow up.	Significant improvement in abdominal pain, irregular bowel movement and heaviness in abdomen after eating.
25 August 2026	Fibroscan repeated	Improvement in the parameters

Diagnostic Assessment

The patient underwent abdominal ultrasonography revealing grade 2 fatty liver. Liver transient elastography (Fibroscan) reported stiffness (kPa) 9.4, UAP (dB/M) 328 suggesting moderate fibrosis. Laboratory findings revealed deranged lipid profile and elevated Serum Glutamic Pyruvic Transaminase and Serum Glutamic Oxaloacetic Transaminase levels.

The case was also assessed using classical Ayurvedic parameters. The main pathological event involved *Agnivikruti* (impaired digestive power), leading to *Dushta Meda* (fat) deposition in the liver confirming the Ayurvedic diagnosis of *Yakrit Vikara* (liver disease).

Clinical Findings

At the time of assessment, the patient's pulse rate was 82/min, blood pressure was 130/80 mmHg, and respiratory rate was 15/min. The body temperature was normal. No abnormal clinical finding for cardiovascular and respiratory systems was observed on examination. Height was 160cm and weight 82kg constituting a BMI 32.03kg/m². On abdominal examination, the abdomen appeared distended, mild tenderness was present in the epigastric region and the abdomen was firm on palpation on right hypochondrium. Bowel sounds were normal on auscultation. No significant clinical finding for neurological system was observed on examination.

Differential diagnosis – Alcoholic Liver Disease was ruled out after negative history regarding intake of alcohol and confirmation from family members. There was no history of chronic or recent use of hepatotoxic drugs, Viral markers for hepatitis were also negative.

Therapeutic Interventions

Initially *Deepana Pachana* was advised to overcome the *Sama awastha* (toxic metabolic by products) associated with the *Doshas*. Choice of drugs was made keeping emphasis on *Deepana*, *Pachana*, *Srotoshodhana* (cleaning of body channels), *Vatanulomana* (Vata-regulating), and *Yakritprasadana* (liver-rejuvenating).

Table 2: Therapeutic Interventions

Date	Drug	Dose and frequency	Duration	Route of administration
8/5/26	<i>Aarogyavardhini Vati</i> <i>Gokshuradi Guggulu</i> <i>Punarnavasava</i>	250 mg twice a day 250 mg twice a day 15 ml twice a day with equal water	15 days	Oral

	<i>Panchnimba Churna</i>	2 gm once at night		
19/6/26	<i>Aarogyavardhini Vati</i> <i>Punarnava Mandoor</i> <i>Punarnavasava</i> <i>Haritaki Churna</i>	250 mg twice a day 250 mg twice a day 15 ml twice a day with equal water 5 gm once at night	15 days	Oral
25/7/26	<i>Aarogyavardhini Vati</i> <i>Gokshuradi Guggulu</i> <i>Punarnavashtak Kwatha</i> <i>Kamdudha Ras</i>	250 mg twice a day 250 mg twice a day 40 ml twice a day 125 mg twice a day	15 days	Oral
25/8/26	<i>Aarogyavardhini Vati</i> <i>Gokshuradi Guggulu</i> <i>Punarnavashtak Kwatha</i> <i>Lahsunadi Vati</i>	250 mg twice a day 250 mg twice a day 40 ml twice a day 250 mg twice a day	15 days	Oral

Follow Up and Outcomes

Table 3: Changes in *Yakrit roga* signs and symptoms

Subjective Parameters	Before treatment	After treatment
<i>Udarshoola</i> (pain in the abdomen)	Moderate	None
<i>Utkleśha</i> (feeling of nausea and vomiting)	Mild	None
<i>Aruchi</i> (loss of appetite)	None	None
<i>Hṛitkaṇṭahadāha</i> (heartburn)	Mild	None

Table 4: Obesity related parameters

Parameter	Before treatment	After treatment
<i>Ayusho Hrasa</i> (deficient in longevity)	Moderate	None
<i>Javoparadha</i> (Slow in movement)	Moderate	None
<i>Krichchavyavaya</i> (difficult to indulge in sexual intercourse)	Severe	Mild
<i>Daurbalyam</i> (weak)	Moderate	None
<i>Daurgandhya</i> (Bad smell)	Severe	Mild
<i>Swedabadha</i> (much sweating)	Severe	None
<i>Ati Kshudha</i> (excessive hunger)	Moderate	None
<i>Ati Pipasa</i> (excessive thirst)	Moderate	None

Table 5: Objective criteria

Parameter	Before treatment	After treatment
Aspartate aminotransferase (U/L)	47	28
Alanine transaminase (U/L)	60	27
Fasting blood glucose (mg/dl)	91.4	
Postprandial blood glucose (mg/dl)	160.6	128
Total cholesterol (mg/dl)	331.9	220
Triglycerides (mg/dl)	207.7	127.3
Low-Density Lipoprotein (mg/dL)	249	201
High-Density Lipoprotein (mg/dL)	41	43
Fibroscan	Stiffness (kPa) 9.4, UAP (dB/M) 328	Stiffness (kPa) 7.3, UAP (dB/M) 276

Table 6: Anthropometric parameters

	Before treatment	After treatment
Height (cm)	160	160
Weight (kg)	82	75
BMI	32.03	29.29

DISCUSSION

The present case provides an opportunity to examine MASLD through both contemporary hepatological and Ayurvedic frameworks. From modern medicine, MASLD is understood as a metabolic liver disorder associated with hepatic steatosis and cardiometabolic risk. The condition progresses through several mechanisms, including increased mobilization of fatty acids from peripheral adipose tissue, reduced hepatic utilization of fatty acids, enhanced hepatic fatty acid synthesis, impaired secretion of fats from the liver, and elevated esterification of fatty acids into triglycerides. Furthermore, fatty liver is a common cause of liver dysfunction and may lead to serious complications if not acted upon early.^[6]

In accordance with Ayurveda, the patient's clinical phenotype may be interpreted through *Agni*, *Meda*, *Kapha*, *Ama* and *Medovaha Srotas*. The classical texts identify *Santarpana* (overeating and sedentary lifestyle) as main etiological factor. The concept of *Agni* impairment is particularly relevant to construct the therapeutic strategy since *Agni* is related with abnormal transformation of *Ama*. Similarly, *Meda Dhatu* and *Medovaha Srotas* provide a conceptual framework for understanding excessive adiposity and altered lipid metabolism.

The observed clinical improvement in biochemical, clinical and radiological parameters can be attributed to the combined effect of Ayurveda interventions.

Arogyavardhini vati was included as the principal hepatoprotective formulation. It consists of *Katuki*, *Nimba*, *Triphala*, *Guggulu*, *Shilajatu* and other mineral components which possess *Deepana*, *Pachana*, *Anulomana*, *Pittavirechana* and *Rasayana* properties. In a prospective cohort study involving dyslipidaemic patients, *Arogyavardhini Vati* administration was associated with significant reductions in total cholesterol, LDL cholesterol, triglycerides, C-reactive protein and blood glucose, without significant deterioration in measured hepatic or renal safety parameters.^[7] Similarly, a randomized controlled clinical trial reported that *Arogyavardhini* therapy combined with lifestyle modification produced greater improvement in several metabolic parameters, particularly serum triglycerides and waist circumference, than lifestyle modification alone.^[8]

Gokshuradi guggulu was primarily used for its *Kapha Vata Shamak*, *Mutrala*, *Shothahara* and *Srotoshodhana* properties. The formulation contains *Gokshura*, *Guggulu*, *Triphala*, *Trikatu* and *Musta* which exhibit antioxidant, anti-inflammatory and lipid-modulating effects constituting it relevant to metabolic disorders. The Central Council for Research in Ayurvedic Sciences and the Ministry of Ayush have also included *Gokshuradi Guggulu* among Ayurvedic formulations used in the context of metabolic disorders.^[9]

Punarnavashtak kwatha is traditionally regarded as *Shothahara* and *Mutrala*. The combination of ingredients possesses *Deepana*, *Pachana*, *Shothahara*, *Mutrala* and *Rasayana* properties. Experimental and clinical literature on *Punarnava* and its constituents has suggested hepatoprotective, antioxidant and anti-inflammatory potential.

Panchanimba Churna was used as an additional *Tikta*, *Pachana* and *Pitta-Kapha shamaka* formulation. *Panchanimba Churna* is predominantly composed of *Nimba*-based ingredients and is traditionally indicated in *Kushtha* and *Raktadushti*.^[10] *Yakrit* is considered to be one of the *Moolshtana* of *Raktasvaha srotas*. This provides a conceptual rationale for its use as liver (*Yakrit*) has a close relationship with *Rakta* and *Pitta* in Ayurvedic physiology.

An important strength of the present case is the use of objective parameters such as liver function tests, metabolic investigations and ultrasonography to document treatment response. However, the interpretation is limited by the inherent limitations of a single-case report, absence of a comparator, inability to separate the effects of individual formulations, and potential influence of dietary and lifestyle modification. Nevertheless, the findings should be considered hypothesis-generating rather than confirmatory. Well-designed randomized controlled trials with adequate sample sizes, standardized formulations, objective assessment of hepatic steatosis and fibrosis, and long-term safety monitoring are required to establish the efficacy and safety of this combined regimen.

CONCLUSION

The case report demonstrates significant effect of Ayurvedic interventions on clinical symptoms, liver biochemical parameters and hepatic steatosis on

follow-up assessment, with no reported adverse events. The results obtained from treatment strategy are encouraging, however, evidence from a single case study cannot establish treatment efficacy. Further well-designed clinical trials may be carried out to test the efficacy of these interventions in similar conditions.

Patient Perspective

Patient was satisfied to get remission from the complaint. He said "After completing the Ayurvedic treatment, I experienced significant improvement in my overall health and digestive symptoms. My energy levels increased, and I felt less heaviness and discomfort. Follow-up investigations showed improvement in liver parameters and fatty liver. I am satisfied with the treatment and motivated to maintain dietary and lifestyle changes."

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Cite this article as:

Shubhi Gupta, Rajendra Kumar Soni, Akshita Gupta. Effect of Ayurvedic Interventions on Metabolic Dysfunction-Associated Steatotic Liver Disease (Yakrit Vikara). *AYUSHDHARA*, 2026;13(4):300-304.

<https://doi.org/10.47070/ayushdhara.v13i4.2954>

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

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