ISSN: 2322 - 0902 (P)
ISSN: 2322 - 0910 (O)

International Journal of Ayurveda and Pharma Research

Case Study

AYURVEDIC AND YOGIC INTERVENTION FOR NON-ALCOHOLIC FATTY LIVER DISEASE REVERSAL (NAFLD)

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Article info

Article History:
Received: 17-01-2025
Accepted: 21-02-2025
Published: 07-03-2025

KEYWORDS:
Ayurveda, NAFLD, *Yakrit Vikara, Agni Dushti, Panchakarma,* Yoga, Liver Detoxification.

ABSTRACT

Non-Alcoholic Fatty Liver Disease (NAFLD) is a progressive liver disorder characterized by excessive fat accumulation, inflammation, and fibrosis, often associated with metabolic conditions like obesity, diabetes, and dyslipidemia. Conventional treatments focus on lifestyle modifications and pharmacological interventions but may not effectively halt disease progression. Ayurveda considers NAFLD as a disorder of *Medoroga* and *Yakrit Vikara*, primarily caused by *Agni Dushti* and imbalanced *Kapha-Pitta dosha*, leading to impaired lipid metabolism. Ayurvedic management emphasizes *Shodhana* (detoxification), *Deepana-Pachana* (digestive stimulants), *Yakrit Uttejaka* (hepatostimulants), and *Rasayana* (rejuvenation therapy), along with dietary modifications and lifestyle interventions. Yoga therapy, including *Asana*, *Pranayama*, and meditation, supports liver detoxification, enhances digestion, and improves metabolic function. This case study presents the successful management of NAFLD in a middle-aged patient through a combination of Ayurvedic therapies and Yoga. Outcome assessment was based on improvements in liver function tests, lipid profile, glycemic control, symptom relief, and ultrasound findings over an 8-week treatment period. The results suggest that an integrative approach incorporating Ayurveda and Yoga can provide effective, sustainable management of NAFLD, potentially preventing its progression to severe liver conditions.

INTRODUCTION

Non-Alcoholic Fatty Liver Disease (NAFLD) is a progressive metabolic liver disorder that includes a spectrum of conditions ranging from simple hepatic steatosis to Non-Alcoholic Steatohepatitis (NASH), fibrosis, cirrhosis, and hepatocellular carcinoma (HCC). It is one of the leading causes of chronic liver disease globally, with an estimated prevalence of 25-30% in the general population. NAFLD is closely linked to obesity, insulin resistance, type 2 diabetes, dyslipidemia, and metabolic syndrome, making it a major public health concern. The transition from simple steatosis to NASH occurs in approximately 20-25% of cases, increasing the risk of advanced liver damage and systemic complications.

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Quick Response Code

https://doi.org/10.47070/ijapr.v13i2.3558

Despite the increasing burden of NAFLD, conventional medicine primarily focuses on lifestyle modifications, weight management, and pharmacological interventions; however, effective pharmacotherapy remains limited. Ayurveda provides a holistic approach to liver disorders, categorizing NAFLD under *"Yakrit Vikara"* (liver disorders) and *"Medoroga"* (lipid metabolic disorders), with *Kapha-Pitta Dushti, Agni Mandya* (digestive impairment), and *Ama* (toxic accumulation) as key pathophysiological factors. Ayurvedic management includes *Shodhana* (detoxification), *Deepana-Pachana* (metabolic correction), *Rasayana* (rejuvenation therapy), and hepatoprotective herbs to restore liver function.

A growing body of research supports the therapeutic role of phytochemicals in NAFLD management due to their antioxidant, anti-inflammatory, and lipid-lowering properties. Key Ayurvedic herbs such as *Bhumyamalaki (Phyllanthus niruri), Kutki (Picrorhiza kurroa), Guduchi (Tinospora cordifolia), Triphala*, and *Guggulu* have demonstrated hepatoprotective potential. Additionally, Yoga therapy, including *Asana*, *Pranayama*, and meditation, plays a

significant role in improving metabolic health, enhancing liver detoxification, and reducing oxidative stress.

This paper aims to explore the integrative approach of Ayurveda and Yoga in effectively managing NAFLD, with a focus on its pathophysiology, Ayurvedic perspectives, treatment strategies, and clinical outcomes.

Patient Information

History & Report's Findings

A 45-year-old male, diagnosed with Non-Alcoholic Fatty Liver Disease (NAFLD), visited the outpatient department (OPD) on March 10, 2023, with complaints of fatigue, mild jaundice, abdominal discomfort, bloating, and irregular bowel movements for the past three months. The patient had a history of obesity, dyslipidemia, and borderline hypertension, along with a sedentary lifestyle and poor dietary habits, including excessive intake of fried and processed foods. Laboratory investigations revealed elevated liver enzymes (AST, ALT), increased triglycerides, borderline fasting glucose, and fatty infiltration on abdominal ultrasound, confirming the NAFLD diagnosis. The patient sought Ayurvedic and Yogic intervention for a holistic and sustainable approach to managing his condition.

Laboratory investigations showed:

- Liver Enzymes: Elevated AST (85 IU/L), ALT (95 IU/L)
- Lipid Profile: Increased total cholesterol (250mg/dL), LDL (160mg/dL), and triglycerides (220mg/dL)
- Fasting Blood Sugar: 140mg/dL
- HbA1c: 7.5%
- Ultrasound Abdomen: Grade 2 fatty liver with mild hepatomegaly

Clinical Findings

The patient was afebrile, with a mildly icteric appearance, indicative of hepatic dysfunction. Pulse rate was 78/min, and blood pressure was 124/80mmHg. Examination of the gastrointestinal system revealed mild tenderness in the right hypochondriac region, while no abnormalities were detected in other systems.

According to Ayurvedic assessment, *Nadi* (pulse) was *Kapha-Pittaja, Jihva* (tongue) was *Sama* (coated), *Aakriti* (body build) was *Madhyama* (moderate), and *Mala* (bowel habits) indicated occasional bloating and sluggish digestion. *Dashavidha Pariksha* (tenfold examination) revealed *Pitta-Kapha Prakriti* (genetic constitution), *Madhyama Sara* (moderate tissue excellence), *Madhyama Satva* (balanced psychological state), and *Avara* (poor) *Abhyavaharana* (appetite) and *Jaranashakti* (digestive power).

The patient complained of persistent fatigue, postprandial bloating, mild jaundice, dull pain in the right upper abdomen, indigestion, and reduced appetite. Liver function tests (LFTs) indicated elevated AST, ALT, and bilirubin levels, while abdominal ultrasound confirmed hepatic steatosis with mild hepatomegaly. These findings confirmed NAFLD with metabolic dysfunction, necessitating an integrative Ayurvedic and Yogic intervention.

Observed Causes of NAFLD in the Patient

1. Poor dietary habits: High intake of processed foods, transfats, and refined carbohydrates.
2. Sedentary lifestyle: Minimal physical activity with long hours of desk work.
3. Metabolic dysfunction: Underlying insulin resistance and dyslipidemia.
4. Stress and lack of sleep: Chronic stress contributing to hormonal imbalances and weight gain.

Ayurvedic Perspective on NAFLD

Pathophysiology

In Ayurveda, NAFLD can be correlated with *Medoroga* (lipid disorders) and *Yakrit Vriddhi* (hepatic enlargement) due to the imbalance of *Agni* (digestive fire) and *Doshas* (bio-energies). Excessive accumulation of *Ama* (toxins) and impaired lipid metabolism lead to fatty liver conditions.

Diagnosis

Ayurvedic diagnosis includes *Nadi Pariksha* (pulse diagnosis), *Jihva Pariksha* (tongue examination), and *Mutra Pariksha* (urine analysis) to assess metabolic disturbances. Clinical symptoms such as heaviness in the abdomen, fatigue, and indigestion are also considered.

Treatment Module Discussion

The selection of treatment modalities in Ayurveda and Yoga for NAFLD is based on the principles of detoxification, metabolic correction, and rejuvenation.

Dietary Interventions *(Ahara)*

- A low-fat, high-fiber diet is chosen to reduce lipid accumulation and enhance digestion.
- Bitter vegetables *(Karela, Methi, Neem)* help detoxify the liver and reduce *Kapha* dominance.
- Turmeric, ginger, and black pepper are included for their anti-inflammatory and hepatoprotective properties.
- Processed foods, refined sugars, and excessive dairy are avoided to prevent further fat accumulation.

Herbal Remedies *(Aushadhi)*

- *Kutki (Picrorhiza kurroa):* Chosen for its hepatoprotective and detoxifying properties, supporting liver regeneration.

- *Bhumyamalaki (Phyllanthus niruri):* Known to be an antioxidant and effective in liver cleansing.
- *Triphala*: Included to regulate digestion and enhance lipid metabolism.
- *Guggulu (Commiphora wightii):* Helps in reducing cholesterol and lipid accumulation, aiding metabolic balance.

Detoxification Procedures *(Panchakarma)*

- *Virechana* (Purgation Therapy): Selected to eliminate excess *Pitta* and toxins from the liver, improving digestion and metabolism.
- *Basti* (Medicated Enema): Helps in regulating lipid metabolism and detoxifying the colon, which plays a role in liver health.
- *Raktamokshana* (Bloodletting): Used to purify the blood, reduce inflammation, and enhance liver function.

Treatment Schedule

- Week 1-2: Strict dietary modifications, herbal medications *(Kutki, Bhumyamalaki),* and liver detoxification practices.
- Week 3-4: Introduction of *Panchakarma* therapies including *Virechana* and *Basti.*
- Week 5-6: Daily Yoga practice with *Bhujangasana, Dhanurasana, Pavanamuktasana, Paschimottanasana, Ardha Matsyendrasana*, *Ustrasana and Kapalabhati, Bhastrika, Agnisara Kriya*.
- Week 7-8: Lifestyle modifications with stress management through meditation and adequate sleep hygiene.

OBSERVATIONS AND RESULTS

Over the course of 8 weeks, significant improvements were noted in the patient's pathological readings and symptoms:

- Week 2: Fatigue slightly reduced, mild improvement in digestion.
- Week 4: AST and ALT levels started to decline, triglycerides dropped slightly, reduction in bloating.
- Week 6: Increased energy levels, notable reduction in LDL and total cholesterol, better glycemic control.
- Week 8: Liver size normalized, AST and ALT significantly reduced, improved lipid profile, complete relief from fatigue and abdominal discomfort.

CONCLUSION

After 8 weeks of integrative treatment, the patient showed significant improvement in both pathological readings and clinical symptoms:

Table 1: Patient's Lab Readings (Before & After Treatment)

Parameter	Before Treatment	After 8 Weeks
AST (IU/L)	85	40
ALT (IU/L)	95	45
Total Cholesterol (mg/dL)	250	190
LDL (mg/dL)	160	110
Triglycerides (mg/dL)	220	150
Fasting Blood Sugar (mg/dL)	140	110
HbA1c (%)	7.5	6.2

Table 2: Important Ultrasound Findings

Before Treatment	After 8 Weeks
Grade 2 Fatty Liver	Liver size normalized
Mild Hepatomegaly (enlargement)	No signs of hepatomegaly

These findings confirmed NAFLD with metabolic dysfunction, necessitating an integrative Ayurvedic and Yogic intervention.

The holistic approach of Ayurveda and Yoga in managing NAFLD not only improved liver function but also enhanced overall metabolic health. These findings suggest that integrating traditional healing methods with lifestyle modifications can provide sustainable and effective management for NAFLD.

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Cite this article as:
Indrayani Kedar Joshi. Ayurvedic and Yogic Intervention for Non-Alcoholic Fatty Liver Disease Reversal (NAFLD). International Journal of Ayurveda and Pharma Research. 2025;13(2):1-7.
https://doi.org/10.47070/ijapr.v13i2.3558
Source of support: Nil, Conflict of interest: None Declared

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