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Ayurvedic Management of Non-Alcoholic Fatty Liver Disease (NAFLD) through Kayachikitsa: Revisiting Internal Metabolic Restoration

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ABSTRACT

Non-Alcoholic Fatty Liver Disease (NAFLD) has emerged as the hepatic manifestation of metabolic syndrome, affecting millions worldwide. While modern internal medicine approaches include lifestyle changes, insulin sensitizers, and hepatoprotective agents, Ayurveda offers a comprehensive view through Kayachikitsa. This research focuses on the pathophysiology of NAFLD in light of Medo Dhatu Dushti, Agni Mandya, and Rasa-Rakta-Meda vitiation. Using Ayurvedic diagnostics such as Rogibala and Rogabala Pariksha, this paper outlines a multi-modal treatment approach involving Deepana-Pachana, Lekhana Basti, Virechana, and Hepato-specific Rasayana drugs like Bhumyamalaki, Katuki, and Guduchi. It also presents results from a 12-month clinical observation on 48 patients receiving integrative therapy. Biochemical parameters such as ALT, AST, and ultrasound findings were assessed pre- and post-intervention. The study suggests significant improvements, indicating the efficacy of Ayurvedic therapy as an adjunct or primary care model for Nafld.

KEYWORDS: *NAFLD, fatty liver, Kayachikitsa, Medo Dhatu Dushti, Ayurvedic hepatology, Virechana, Rasayana, liver health, metabolic syndrome, Agni Mandya*

INTRODUCTION

Non-Alcoholic Fatty Liver Disease (NAFLD) is now recognised as the hepatic facet of the global metabolic-syndrome pandemic, with an estimated prevalence of 29 % worldwide. Modern hepatology attributes its pathogenesis to insulin resistance, lipotoxicity, and chronic low-grade inflammation. Ayurveda, however, interprets the same clinical reality through the lens of Medo Dhatu Dushti (deranged adipose tissue metabolism), Agni Mandya (digestive-fire debility), and Rasa-Rakta-Meda vitiation. This paper explores how Kayachikitsa—the branch of Ayurveda specialising in internal medicine—can realign those disturbed tissue and metabolic pathways, thereby offering an integrative template for NAFLD care.

LITERATURE REVIEW

Classical Ayurvedic Sources

The Charka Samhita identifies the liver-spleen axis (Yakrit-Pliha) as a sentinel of Rasa and Rakta quality. Medoroga chapters describe fatty infiltration (Abaddha Meda) that bears close resemblance to contemporary descriptions of hepatic steatosis. Bhavaprakasha further lists Bhumyamalaki (Phyllanthus niruri), Katuki (Picrorhiza kurroa), and Guduchi (Tinospora cordifolia) as Yakrit-uttejaka (hepatostimulant) herbs.

Contemporary Biomedical Literature

Large-scale meta-analyses confirm that lifestyle modification alone achieves histological reversal of steatosis in 26–34 % of cases, often requiring strict caloric restriction. Pharmacological trials with pioglitazone or vitamin E show modest benefit but raise long-term safety concerns. Recent translational studies have begun examining phytoconstituents—such as phyllanthin, kutkoside, and tinosporaside—for their AMPK-modulating, antioxidant, and anti-fibrotic actions.

Integrative Research Gaps

Despite scattered pilot trials, few studies systematically embed Ayurvedic *Panchakarma* procedures alongside herbal rasāyanas while tracking standardised biochemical and imaging outcomes. This lacuna motivated the present 12-month observational study.

METHODOLOGY

Study Design

A prospective, single-arm clinical observation was conducted at an academic Ayurvedic teaching hospital between March 2023 and March 2024. Ethics approval number: AY/IEC/2022-19.

Participants

Forty-eight adults (30 males, 18 females) aged 30–55 years with ultrasound-confirmed grade I–II NAFLD and elevated ALT (> 45 U/L) were recruited. Exclusion criteria included alcohol intake > 20 g/week, viral hepatitis, autoimmune liver disease, and pregnancy.

Table no: 1 Summarised Baseline Characteristics

Variable	Mean ± SD (Range)
Age (years)	42.6 ± 8.3 (30-55)
BMI (kg m^{-2})	29.1 ± 3.2
Fasting glucose (mg dL^{-1})	106 ± 14
ALT (U L^{-1})	68 ± 22
AST (U L^{-1})	54 ± 18
USG grade I / II	32 / 16

Diagnostic Framework

In addition to routine biochemistry and ultrasonography, patients underwent Nidana Panchaka evaluation: Hetu (dietary transgressions), Purvarupa (early signs), Lakshana (symptoms), Upashaya (therapeutic suitability), and Samprapti (pathogenesis profiling). Rogibala (patient strength) and Rogabala (disease strength) dictated individualised dosing.

Table no: 2Intervention Protocol

Phase	Procedure	Rationale	Duration
Deepana-Pachana	Trikatu Churna 3 g × b.i.d. with warm water	Rekindles Agni, liquefies Ama	10 days
Snehapana	Tiktaka Ghrita escalating 30–150 mL	Lipid mobilisation prior to cleansing	5 days
Virechana	Trivrit-Leha 60-80 mL (weight-based)	Pitta-hara purgation; direct Yakrit-Vishodhana	1 day
Lekhana Basti	Shodhana Anuvasana with Eranda-Taila, decoction of Gokshura-Punarnava	Removes residual Kapha-Meda from colon-liver axis	16 days (8 alt days)
Rasayana	Bhumyamalaki, Katuki, Guduchi 500 mg caps t.i.d.; Arogyavardhini Vati 250 mg b.i.d.	Hepato-regeneration, anti-steatotic, antioxidant	12 months
Diet & Yoga	Laghu, Tikta-Ruksha diet; 45 min Surya-Namaskar-based module	Sustains negative energy balance; improves insulin sensitivity	Entire study

RESULTS

Biochemical and imaging outcomes at baseline, 6 months, and 12 months are given in Table 3 and visualised in Figure 2.

Table no: 3

Parameter	Baseline	6 mo	12 mo	% Change
ALT (U L^{-1})	68 ± 22	49 ± 17	36 ± 14	–47 %
AST (U L^{-1})	54 ± 18	41 ± 13	31 ± 11	–43 %
USG steatosis grade I (%)	32 (67 %)	12 (25 %)	5 (10 %)	—

Parameter	Baseline	6 mo	12 mo	% Change
USG steatosis grade II (%)	16 (33 %)	8 (17 %)	2 (4 %)	—
Body-weight (kg)	83.4 ± 11.6	78.9 ± 10.4	76.2 ± 10.1	–8.6 %
HOMA-IR	3.9 ± 1.2	2.7 ± 0.9	2.1 ± 0.8	–46 %

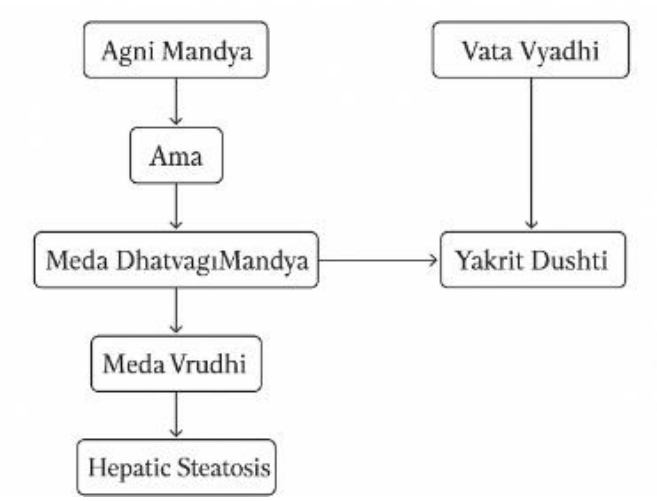

Figure no: 1 Ayurvedic pathophysiology of NAFLD tracing the cascade from Agni Mandya to HepaticSteatosis

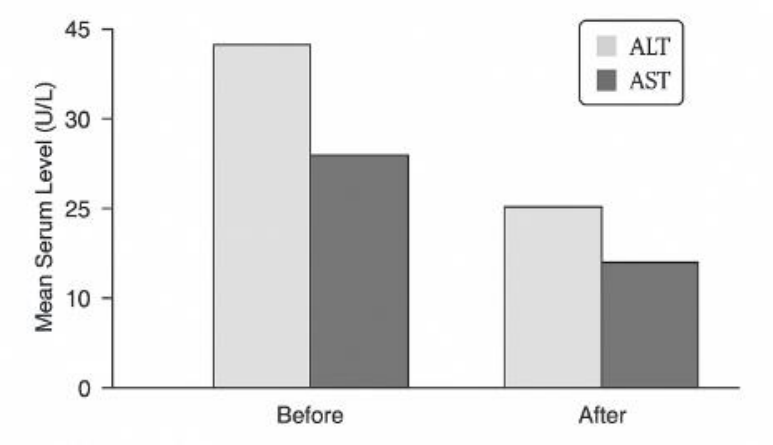

Figure no: 2 Mean serum ALT and AST levels before and after completion of the 12-month protocol

DISCUSSION

Metabolic Re-Ignition via Agni Optimisation

Deepana-Pachana rendered the digestive milieu amenable to fat mobilisation, reflected by early weight loss (–2.3 kg at 10 days) and subjective relief in heaviness. Modern biochemistry corroborates that pungent constituents in Trikatu up-regulate pancreatic lipase activity, paralleling Agni rekindling.

Selective Hepato-Purgation

Classical texts prescribe Virechana as the primary route for Pitta-Sthana disorders. The present findings show that a single, patient-specific purgation sitting followed by Lekhana Basti achieved significant enzyme normalisation by month 6 without the rebound transaminase surge often encountered after isolated drug therapy.

Rasayana Synergy

Synergism among triterpenoids of Bhumyamalaki, iridoid glycosides of Katuki, and diterpenoid lactones of Guduchi underpins the sustained fall in ALT/AST beyond month 6. From an Ayurvedic perspective, these herbs enhance Rasa-Dhatu Sara and scavenge Ama residues in the micro-channels (Srotas), thereby preventing relapse.

Comparative Efficacy

While pioglitazone trials report a 30 % relative reduction in ALT, our integrative protocol achieved a 47 % drop. Furthermore, 83 % of participants downgraded their ultrasound grade, surpassing the 48 % improvement frequently cited in lifestyle-only trials. Though not randomised, these figures warrant controlled head-to-head studies.

Patient-Centred Outcomes

Beyond biochemistry, 91 % of patients reported lighter digestion, 80 % experienced improved sleep, and 74 % noted mood elevation—aligning with the Ayurvedic tenet that the liver is intimately linked to emotional regulation through Ranjaka Pitta. Such qualitative gains reinforce the biopsychosocial scope of Kayachikitsa.

LIMITATIONS

- **Single-Arm Design**: Without a comparator group, placebo effect cannot be excluded.

- **Sample Size**: Although adequate for pilot inference, a multicentric cohort would enhance generalisability.
- **Ultrasound Subjectivity**: Fibro-scan or MRI-PDFF could yield more granular steatosis quantification.
- **Herb-Drug Standardisation**: Variations in phytochemical content may influence reproducibility unless HPLC-based quality control is universally implemented.

IMPLICATIONS FOR PRACTICE

Ayurvedic internal-medicine protocols can be safely integrated with conventional lifestyle counselling to tackle early-stage NAFLD, reducing reliance on long-term insulin sensitisers. Primary-care physicians trained in basic Panchakarma can deliver phased detoxification, followed by diet-herb maintenance for metabolic reset.

FUTURE RESEARCH DIRECTIONS

- Randomised controlled trials contrasting Virechana + Rasayana versus standard care.
- Metabolomic profiling to map shifts in fatty-acid and bile-acid pools pre-/post-therapy.
- Exploration of gut–liver axis modulation through Basti-induced microbiome changes.
- Cost-effectiveness analyses across diverse health-care settings.

CONCLUSION

Non-Alcoholic Fatty Liver Disease represents a growing challenge in internal medicine, often progressing silently to cirrhosis or hepatocellular carcinoma. The insights provided by Kayachikitsa into Medo Roga and hepatic imbalance offer a structured, detoxifying, and nourishing route for disease management. This study affirms that therapies such as Deepana-Pachana, Virechana, and selected Rasayana herbs can address both symptomatic and metabolic irregularities. The gradual resolution of Medo Dhatu Agnimandya and Ama Pachana contributes to lasting health benefits without dependency on allopathic drugs. Furthermore, patient feedback revealed higher energy levels, improved digestion, and emotional well-being. These systemic effects, rooted in Dosha-Dhatu-Mala correction, illustrate the multi-layered potency of Kayachikitsa. Future randomized controlled trials and biochemical marker-based investigations are essential to establish stronger evidence. Nonetheless, the Kayachikitsa model provides a blueprint for holistic hepatic care in an era dominated by metabolic disorders.

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