Case Report

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Potential Role of Ayurveda Interventions in the Management of Grade II Non Alcoholic Fatty Liver Disease: A Case Report

Ayurveda Section

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ABSTRACT

Non Alcoholic Fatty Liver Disease (NAFLD) represents a growing global health concern, particularly driven by rising obesity rates, with prevalence ranging from 11.2 to 37.2% in the general population. Ayurveda classifies NAFLD under *Yakrit Roga* (liver disease) and *Medoroga* (obesity), with traditional texts attributing its development to lifestyle factors that lead to imbalances in *tridosha*. Hereby, the authors present a unique case of 59-year-old male that highlights the therapeutic effects of Ayurveda interventions in managing grade II NAFLD, adding valuable insights to the scientific literature by demonstrating effective treatment in the absence of a standard care protocol. The patient presented with symptoms of indigestion and liver enlargement consistent with grade II NAFLD, confirmed through ultrasonography evaluation. Clinical findings included liver steatosis and mild hepatomegaly. The intervention involved Ayurveda-based therapies tailored to the patient's condition, focusing on balancing *Rakta-Kapha Dushti* and dietary modifications based on classical Ayurveda guidelines. Following treatment, the patient experienced complete relief from symptoms of indigestion, and follow-up ultrasonography showed significant improvement, as there was no NAFLD. The present case report illustrates the potential of *Chitrakadi Vati* and *Phaltrikadi Kashaya* ghan vati as effective management strategies for NAFLD, particularly in the absence of established standard care. The takeaway lesson is that individualised Ayurveda treatment may offer a viable therapeutic approach for NAFLD, highlighting the importance of integrating traditional medicine into the broader clinical context of liver disorders.

Keywords: *Chitrakadi vati*, *Phaltrikadi kashaya*, *Yakrit roga*

CASE REPORT

A 59-year-old married businessman with a sedentary lifestyle and a history of non alcoholic status sought Ayurveda treatment. His main complaints were fatigue, abdominal heaviness after meals, and incomplete bowel evacuation, ongoing for the past six months. He reported being relatively healthy a year ago, but in the last ten months, he experienced weight gain, abdominal heaviness, and constipation. The patient had a significant medical history of cholelithiasis, for which he underwent surgery three-year-ago. He was also diagnosed with type II Diabetes Mellitus, managed with 1 gram of metformin daily.

Before seeking Ayurveda intervention, he consulted a gastroenterologist and was prescribed H2 blockers and lactulose for abdominal distension and bowel issues. Despite ongoing conventional treatment, his symptoms persisted, prompting him to explore Ayurveda. According to his family history, his father passed away due to cardiac arrest in 2011, and his mother passed away at age 85 years from unknown causes. No other significant medical or psychological history was reported.

The patient intermittently used H2 blockers and laxatives over the past six months but did not experience sustained relief. On presentation, he was also using Ayurveda formulations, including *Phaltrikadi Kashaya Vati* and *Chitrakadi Vati*, targeting his digestive issues. Physical examination revealed fatigue. The patient was 6 feet 2 inches (185 cm) tall, weighed 110 kg, and had a Body Mass Index (BMI) of 32.14 kg/m^2, indicating obesity. His vitals were stable, with a pulse rate of 76/min, blood pressure of 140/82 mmHg, and respiratory rate of 19 breaths/min [Table/Fig-1]. He was alert and oriented, with normal bronchovesicular and cardiac sounds.

Abdominal examination revealed mild tenderness in the right hypochondrium and umbilical regions; the liver was palpable and enlarged. Four small surgical scars from the previous cholelithiasis surgery were present. Ayurveda assessment identified him as having *Vata-Kapha Prakriti* with poor digestive capacity (*Ahara Shakti*).

Parameters	At baseline	At 30th day	At 60th day	At 90th day
Height (cm)	185	-	-	-
Weight (kg)	110	106	102.8	102
Waist circumference (cm)	100	98 cm	90	90
BMI (kg/m^2)	32.14	30.9	30	29
Blood pressure (mmHg)	140/82	130/80	134/84	128/76
Pulse/min	94	92	86	82
Respiration rate/min	19/min	17/min	22/min	16/min

[Table/Fig-1]: Physical parameters of the patient.

The patient underwent a comprehensive evaluation, including a physical examination, laboratory tests (haemogram, lipid profile, liver function tests) [Table/Fig-2-4], and imaging studies. An abdominal ultrasound confirmed grade II fatty liver disease and Benign Prostatic Hyperplasia (BPH). The clinical findings were consistent with dyslipidemia and an elevated BMI. The primary diagnosis was grade II NAFLD with associated dyslipidemia and BPH. Key

Parameters	Investigations done on		
	21/11/2021 (baseline)	3/3/2022 (after 90 days)	9/7/2022 (after 180 days)
HB	16.3 gm/dL	14.50 gm/dL	14.80 gm/dL
PCV	43.50%	43.50%	44.70%
RBC	5.40 mill/mm^2	5.40 /mm^3	5.46/mm^3
MCV	81 fL	80.60 fL	81.60 fL
MCH	28.3 pg	26.80 pg	27 pg
TLC	7640/cu.mm/mm^3	10.30/mm^3	8.10/mm^3
Platelets	243 thou/mm^3	284 thou/mm^3	21284 thou/mm^3
ESR	Not done	2 mm/hr	2 mm/hr

[Table/Fig-2]: Complete haemogram.
HB: Haemoglobin; PCV: Packed cell volume; RBC: Red blood cells; MCV: Mean corpuscular volume; MCH: Mean corpuscular haemoglobin; TLC: Total leukocyte count; ESR: Erythrocyte sedimentation rate

Parameters	Investigations done on		
	21/11/2021 (baseline)	3/3/2022 (after 90 days)	9/7/2022 (after 180 days)
Liver function test			
SGOT	19 U/L	22 U/L	21 U/L
SGPT	35 U/L	26 U/L	26 U/L
Bilubin (indirect)	0.57 mg/dL	0.50 mg/dL	0.60 mg/dL
Bilubin (direct)	0.32 mg/dL	0.30 mg/dL	0.28 mg/dL
Total bilirubin	0.89 mg/dL	0.80 mg/dL	0.88 mg/dL
GGTP	27 U/L	28 U/L	27 U/L
ALK PO4	102 U/L	93 U/L	93 U/L
Total protein	6.7 gm/dL	7 gm/dL	7 gm/dL
A/G ratio	1.91	1.80	1.80
Albumin	4.4 gm/dL	4.50 gm/dL	4.50 gm/dL
Kidney function test			
Urea	9 mg/dL (BUN)	19.20 mg/dL	20 mg/dL
Creatnine	0.74 mg/dL	0.72 mg/dL	0.76 mg/dL
Uric acid	3.6 mg/dL	4 mg/dL	5 mg/dL

[Table/Fig-3]: Liver and kidney function test.
SGPT: Serum glutamic pyruvic transaminase; SGOT: Serum glutamic oxaloacetic transaminase; GGTP: Gamma glutamyl transpeptidase; ALK PO4: Alkaline phosphatase; A/G: Albumin/globulin; BUN: Blood urea nitrogen

Parameters	Investigations done on		
	21/11/2021 (baseline)	3/3/2022 (after 90 days)	9/7/2022 (after 180 days)
Total cholesterol	101 mg/dL	79 mg/dL	101 mg/dL
Trigycerides	218 mg/dL	110 mg/dL	152 mg/dL
HDL	33 mg/dL	25 mg/dL	29.30 mg/dL
LDL	44 mg/dL	31.70 mg/dL	41.30 mg/dL
VLDL	24 mg/dL	22.20 mg/dL	30.40 mg/dL

[Table/Fig-4]: Lipid profile of the patient.
HDL: High-density lipid; LDL: Low-density lipid; VLDL: Very low-density lipid

challenges included managing the patient's anxiety due to a previous lack of improvement with conventional treatments and ensuring adherence to Ayurveda-based therapies and lifestyle changes. Distinguishing the direct effects of Ayurvedic treatment from concurrent lifestyle modifications posed an additional challenge.

The patient received Ayurvedic pharmacologic treatment over 12 weeks and was advised to visit the hospital after three months, bringing the suggested investigations. Primarily, *Chitrakadi Vati* and *Phaltrikadi Kashaya* were advised to be taken as suggested. No specific dietary or exercise regimens were prescribed during the follow-up without medication. The Ayurvedic treatment included administering *Chitrakadi Vati*, two tablets before meals in the morning and evening, and *Phaltrikadi Kashaya*, two tablets after meals, twice daily. *Chitrakadi Vati* was initially prescribed for seven days to enhance *Agnidipana* (digestive fire). Due to the patient's reported appetite loss when not using *Chitrakadi Vati*, the regimen was extended before transitioning to *Phaltrikadi Kashaya* to better suit the patient's needs. This modification ensured ongoing support for digestion and symptom relief.

The treatment was adjusted based on the patient's feedback regarding appetite loss when *Chitrakadi Vati* (2 tablets before meals with normal water) was not included, leading to a sustained switch to *Phaltrikadi Kashaya* (2 tablets after meals with water) for the remainder of the 12-week period. This approach aimed to optimise therapeutic outcomes and address the patient's evolving needs. Weekly telephonic follow-ups monitored the patient's progress. Compliance was assessed through visual updates of medication containers and tablet counts. Key health metrics, including BMI and biochemical parameters, were evaluated at 3- and 6-month intervals, showing positive responses. The patient exhibited a favourable prognosis, with significant symptomatic and sonographic improvement following Ayurvedic intervention. Consistent adherence to dietary modifications and regular follow-ups suggested a sustained positive outcome, though occasional symptoms like constipation were reported.

As per the safety profile mentioned in [Table/Fig-3], the Ayurvedic formulation was found to be safe, as the liver enzymes remained within the normal limits. However, the patient's triglyceride level was significantly reduced from 218 mg/dL to 152 mg/dL [Table/Fig-4].

The patient was diagnosed with enteric fever during the first visit. His haemoglobin levels were reduced as he was undergoing medication for enteric fever during this period. He received conventional treatment from a family physician, which included Azithromycin 500 mg and Doxycycline 100 mg, along with Paracetamol and Pan 40 for 10 days. It was also observed that all blood parameters, such as lipid values and kidney function parameters had increased after six months, although they remained within the normal reference range. This rise in values may be attributed to the long-term use of antibiotics and antipyretics.

The 12-week Ayurvedic regimen resulted in significant improvements in the symptoms of *Yakrit Roga* (liver disease) and *Medo Roga* (obesity). Enhanced digestion, appetite, bowel regularity, and energy levels were observed, leading to an improved overall quality of life. The patient was managed on an outpatient basis, with a detailed intervention timeline provided in [Table/Fig-5].

Date	Event
November 12, 2021	The patient presented with fatigue, abdominal heaviness after meals, and incomplete bowel evacuation. A detailed systemic examination was conducted, and the patient was advised to undergo blood investigations and an abdominal ultrasound. Patient was advised to walk for 2 km/day and strict diet control was suggested, avoid fried and junk food items/street food.
November 21, 2021	On follow-up, the patient reported some symptomatic relief. Examination revealed dyslipidemia, grade II fatty liver**, and Benign Prostatic Hyperplasia (BPH) on ultrasonography. Vital signs and physical parameters were recorded. Treatment given: tab *Chitrakadi vati* 2BD before food and tab *Phaltrikadi vati* 2BD after food along with the advice to walk for 2 km/day and diet control advised as avoid fried food items and junk food [Table/Fig-1-3].
March 03, 2022	A follow-up visit involved a detailed clinical examination. The patient reported improvement in laboratory parameters and adherence to dietary and lifestyle recommendations. Ultrasound and blood investigations were repeated. Oral medications for NAFLD were discontinued, but the patient was advised to continue metformin [Table/Fig-1-3].
July 09, 2022	The patient was symptomatically better, with no new complaints except constipation. He was taking only metformin (500 mg twice daily). Ultrasound showed further improvement in liver condition [Table/Fig-1-3].

[Table/Fig-5]: Treatment timeline.

The liver function tests, lipid profiles, and blood glucose levels showed significant improvements within three months, while ultrasound imaging indicated a normalised liver echotexture and resolution of fatty changes over six months. The treatment was well tolerated, with no adverse or unanticipated events occurring during the treatment. Additionally, the patient experienced no negative reactions to the Ayurvedic formulations.

DISCUSSION

The case demonstrates the effectiveness of Ayurveda in managing NAFLD through personalised treatment tailored to the patient's unique constitution and symptoms. The individualised nature of the treatment, which focuses on enhancing digestion and liver health, is a notable strength. In the present case, the primary diagnosis was grade II NAFLD, with associated dyslipidaemia and BPH. Other potential causes of chronic liver disease were considered, but non alcoholic aetiologies were prioritised due to the absence of alcohol use. This approach aligns with the understanding that NAFLD can

progress to conditions such as diabetes mellitus, cardiovascular disease, or cirrhosis when not adequately addressed [1].

There is a dramatic rise in the prevalence of NAFLD and its more severe form, Non Alcoholic Steatohepatitis (NASH), driven by increasing rates of obesity, diabetes, and metabolic syndrome [2]. Similarly, in present case, NAFLD was diagnosed in the context of associated conditions such as dyslipidemia. NAFLD is a prevalent condition with the potential to progress to severe liver diseases. Conventional treatments emphasise weight management and glycaemic control, which are effective but often difficult for patients to adhere to consistently. Accordingly, regular follow-up for NAFLD patients is necessary to assess disease progression [3]. This aligns with the case study's approach of frequent follow-ups and monitoring of health metrics like BMI, liver enzymes, and sonographic findings to evaluate the effectiveness of Ayurvedic treatment. As per the standard guidelines for NASH management, lifestyle modifications such as weight loss and exercise are recommended as the first-line treatments for NAFLD and NASH [4]. However, the study also highlights the lack of approved pharmacological treatments for NASH, which resonates with the case study where an alternative Ayurvedic treatment was sought instead [4]. Early intervention is crucial in preventing the progression of NAFLD to more severe liver conditions, emphasising the importance of adherence to treatment and regular monitoring, both of which were prioritised in the case study.

The Ayurvedic interventions, such as *Agni Deepana* (digestive enhancement), *Ama Pachana* (toxin digestion), and *Virechana* [5] (therapeutic purgation), provide a holistic approach by addressing the root causes of liver dysfunction. *Agni* plays a vital role in liver disorders [6]. In Ayurvedic texts, *Phalatrikadi Kwath* is referenced in the treatment of *Pandu* (anaemia) and *Kamala* (chronic liver disorders), where *Kamala* is described as a chronic hepatic condition in *Chakradatta* (8/8), *Sharangdhar Samhita* (2/75), *Yoga Ratnakar*, and *Bhaisajya Ratnavali* (12/22).

Phalatrikadi Kashaya contains eight key herbs that are particularly beneficial in managing *Koshthashrit Kamala* [7,8] (hepatocellular jaundice), cirrhosis, alcoholic hepatitis, fatty liver, and various other liver disorders. *Phalatrikadi Kashaya* [9] is one of the most popular and effective formulations for treating liver disorders. It contains eight key herbs: *Haritaki*, *Vibhitaki*, *Amalaki*, *Amrita*, *Katuki*, *Nimba*, *Kirattika*, and *Vasa*. *Phalatrikadi Kashaya* has *Tridoshahara* properties, and nearly all of its ingredients possess anti-inflammatory and antioxidant effects.

Kutaki is primarily a *pitta virechaka* drug, and *Triphala* is also a well-known laxative formulation. *Chitrakadi Vati* [10] is selected in this case for its *Deepana*, *Pachana*, and *Rochana* properties, as it stimulates *Jatharagni*, which further stimulates *Dhatvagni* and *Bhatagni*, ultimately improving *Dhatu Poshana* and *Uttrottar Dhatu Nirmana*. The combination of *Agni Deepana* for *Ama Pachana* and *Mridu Virechana* by *Phalatrikadi Vati* manages the patient's weight and corrects the fat accumulation in the liver cells [11].

Sahu AK et al., have also highlighted the positive impact of Ayurvedic interventions in a patient with Grade II NAFLD, demonstrating significant clinical improvement without adverse effects. The present case study underscores the potential of Ayurveda to offer a personalised, holistic treatment alternative for NAFLD [11].

CONCLUSION(S)

The present case report supports the use of Ayurveda in managing NAFLD, demonstrating significant clinical and biochemical improvements in a patient who had limited success with conventional treatments. The therapies were tailored to the patient's constitution and symptoms, emphasising the importance of individualised care in Ayurveda. The findings suggest that Ayurveda could be a viable alternative for managing NAFLD, particularly in cases where standard care options are unsatisfactory or unavailable.

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