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Comprehensive *Ayurvedic* Management of Grade 3 Fatty Liver *(Yakrit Vikara)*: A Case Report

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Abstract

Non-alcoholic fatty liver disease (NAFLD), encompassing a range of liver conditions including Grade 3 fatty liver (severe hepatic steatosis), represents a significant global health issue exacerbated by rising obesity, diabetes and metabolic syndromes. Modern medical treatments largely focus on lifestyle changes with limited pharmacological interventions. This case study explores the effectiveness of a comprehensive *Ayurvedic* management strategy in treating a 68-year-old male with Grade 3 fatty liver. The personalized therapeutic regimen included *ayurvedic* medications, combined with *Panchakarma* detoxification therapies and specific dietary adjustments. Post-treatment evaluations demonstrated notable improvements: a reduction in liver size from 144mm to 127mm, normalization of liver echotexture, significant decrease in ALT levels and improved glycaemic control. These results highlight the potential of *Ayurvedic* treatments in managing advanced stages of NAFLD by restoring *Doshic* balance, enhancing metabolic processes and reducing systemic toxins. The findings suggest a viable complementary approach to conventional treatments, emphasizing the need for further research to integrate *Ayurveda* into global strategies battling NAFLD.

Keywords: *Ayurveda*, non-alcoholic fatty liver disease, Grade 3 fatty liver, *Ayurvedic* medicine, *YakritVikara.*

Introduction

Non-alcoholic fatty liver disease (NAFLD) is a spectrum of liver disorders characterized by excessive fat accumulation in hepatocytes, excluding alcohol consumption as a primary cause. Grade 3 fatty liver, also known as severe hepatic steatosis, represents an advanced stage of NAFLD, often associated with complications such as fibrosis, cirrhosis and an increased risk of hepatocellular carcinoma (HCC)[1,2]. The global prevalence of NAFLD is rising due to the increasing burden of obesity, diabetes mellitus and metabolic syndrome, making it a significant public health concern[3]. Despite advances in modern medicine, pharmacological management for NAFLD remains limited, with a strong emphasis on lifestyle modifications and control of metabolic risk factors[4]. In this context, *Ayurveda*, a traditional Indian system of medicine, offers a holistic approach to manage liver disorders through personalized therapeutic regimens involving *ayurvedic* medicines, detoxification therapies (*Panchakarma*) and dietary recommendations [5]. *Ayurvedic* interventions target the root causes of fatty liver, such as impaired digestion (*Agni*), toxin accumulation (*Ama*) and *dosha* imbalances, especially *Kapha and Pitta* [6]. This case study highlights the efficacy of *Ayurvedic* treatment in managing Grade 3 fatty liver by addressing its pathophysiology from an integrative perspective. It demonstrates the potential for improving liver health through a combination of *ayurvedic* medicines, *Panchakarma* therapy and lifestyle modifications, which align with the *Ayurvedic* principle of restoring homeostasis within the body[7].

Non-alcoholic fatty liver disease (NAFLD) is the most common chronic liver disease worldwide, affecting approximately 25-30% of the global population [8]. The prevalence of advanced stages, including Grade 3 fatty liver, is higher in individuals with metabolic syndrome, type 2 diabetes mellitus and obesity [9]. NAFLD is particularly prevalent in developed countries, with rates reaching up to 40% in the United States and the Middle East[10]. In India, the prevalence ranges between 9-32%, with increasing cases reported due to rapid urbanization, sedentary lifestyles and dietary changes [11].

NAFLD not only affects adults but is also a growing concern in paediatric populations, with an estimated 3-10% of children and up to 38% of obese children being affected[12]. The disease is a leading cause of liver-related morbidity and mortality, underscoring the need for effective prevention and treatment strategies[13].

Case Report:

Patient History and Information:

The patient, a 68-year-old male, had a history of inconsistent adherence to dietary modifications recommended for hypertension and fatty liver management. He had not shown a consistent engagement with either allopathic or *Ayurvedic* medications, and there had been no indication of him taking regular treatments from either approach.

Diet and Lifestyle History: The patient led a largely sedentary lifestyle characterized by minimal physical activity, mostly involving seated tasks and brief walks within his neighbourhood. His dietary habits included a high intake of carbohydrate-rich and unhealthy fats, with frequent consumption of

fried snacks and sugary desserts. Fresh fruits and vegetables are rarely included in his meals and he had a preference for sugary beverages.

Medicine History:

Sr. No.	Medicine Name	Dosage
1.	Ursodeoxycholic acid	OD

Surgical History: There were no reports of any surgical interventions.

Family History: Detailed family medical history not been provided, which could be relevant for understanding potential genetic predispositions to metabolic conditions.

Onset and Disease Progression:

The patient presented with discomfort in the right upper abdomen. He also reported poor appetite and occasional nausea. Patient also complained of coughing with sputum and lower back pain with Numbness in the lower extremities. Physical examination revealed obesity, with a body mass index (BMI) of around 29 kg/m². On abdominal examination, hepatomegaly was noted with mild tenderness in the right hypochondrium, but there were no signs of ascites or splenomegaly. Cardiovascular assessment showed blood pressure at 120/80 mmHg, consistent with his history of hypertension and a regular heart rate of 88 beats per minute. Further examination indicated mild pitting oedema in both ankles, but no signs of jaundice, spider angiomas or palmar erythema were observed. The patient's skin and sclera were normal, with no visible icterus. There was no evidence of hepatic encephalopathy or confusion, suggesting no advanced complications like liver failure. These clinical findings aligned with the diagnosis of advanced fatty liver disease compounded by his metabolic and hypertensive history.

Samprapti* of *Yakrit vikara

In *Ayurveda*, *Yakrit Vikara* refers to disorders related to the liver, primarily seen as an imbalance in the *Pitta dosha*, which the liver predominantly houses alongside some aspects of *Kapha*. The *Samprapti* (pathogenesis) typically begins with the aggravation of *Pitta* due to factors such as improper diet, excessive intake of alcohol, or emotional stress. This aggravated *Pitta* then combines with *ama* (toxins resulting from improper digestion) and spreads to the *yakrit* (liver), impairing its ability to purify blood and metabolize fats efficiently. The disruption can lead to a variety of liver issues such as inflammation, jaundice, or fatty liver disease. In many cases, disturbed *Kapha* may accumulate, further complicating the condition by obstructing liver channels and impairing its function.

Initial Factors (Poor diet, lifestyle habits, excessive alcohol, etc.)
↓
Aggravation of *Pitta* (and possibly *Kapha* or *Vata*)
↓
Formation of *Ama* (toxins)
↓
Ama* with *Pitta* affects the liver *(Yakrit)
↓
Disturbance in *Ranjaka Pitta* (responsible for bile production)
↓
Leads to disturbance in liver functions
↓
Manifestation of Symptoms (jaundice, fatigue, etc.)
↓
***Yakrit Vikara* (Liver Disorder)**

Vital Parameters:

- **Body Mass Index (BMI):** The patient presents with a BMI of approximately 29 kg/m², categorizing him as overweight.
- **Blood pressure :** 120/80 mmHg
- **Heart Rate:** Regular, at 88 beats per minute.

***Ayurvedic* Examination:**

Table No. 1. *Ashtavidha Pariksha* (Eight-fold Examination) .

S. No	Examination	Findings
1.	***Nadi* (Pulse)**	*Vata-Pittaj*
2.	***Mutra* (Urine)**	*Avikrita*
3.	***Mala* (Stool)**	*Avikrita*
4.	***Jihva* (Tongue)**	*Saam*
5.	***Shabda* (Voice)**	*Spashta*
6.	***Sparsha* (Touch)**	*Anushna Sheeta*, tenderness in the right hypochondrium upon palpation.
7.	***Drika* (Eyes)**	*Avikrita*
8.	***Akriti* (Appearance)**	*Madhyam*

Table No. 2. *DashavidhaPariksha* (Ten-fold Examination)

Sr. No	Examination	Findings
1.	***Prakriti* (Constitution):**	*VataPittaj*
2.	***Vikriti* (Imbalance)**:	*Pittaj*
3.	***Sara* (Tissue Excellence)**:	*Madhyam*
4.	***Samhanana* (Body Build)**:	Moderate
5.	***Pramana* (Body Proportions)**:	Within normal limits.
6.	***Satmya* (Adaptability)**:	*Avar*
7.	***Satva* (Psychological Strength)**:	*Madhyam*
8.	***Ahara Shakti* (Digestive Strength)**:	*Madhyam*
9.	***Vyayama Shakti* (Exercise Capacity)**:	*Madhyam*
10.	***Vaya* (Age)**:	68yr old, *Vriddha*

Diagnostic Assessment :

Laboratory Results:

1. **Liver Function Tests: Within Normal Limits**

Imaging Results:

1. **Ultrasound**: done on 27/04.2024 suggested the
   - Findings indicate liver measure ~144mm, Granular in echo texture consistent with Liver Parenchymal Disease (grade 3 fatty liver disease).
2. **Fibro Scan**: done on 2/5/2024
   - Measured liver stiffness of 5.5kPa, suggesting significant fibrosis possibly on border of early cirrhosis.
   - CAP (Controlled Attenuation Parameter) score was 337 indicative of significant grade 3 fatty liver disease

***Ayurvedic* Diagnosis:**

In *Ayurveda*, liver disorders are frequently linked to imbalances in *Pitta dosha*, which governs metabolism and transformation. *Kapha dosha*, responsible for structure and lubrication, can also be involved, especially in later stages or specific conditions. In grade 3 liver disease, the pathology may involve a more profound *Pitta* aggravation, leading to severe inflammation and damage. There may also be *Kapha* involvement, which can manifest as structural changes like fibrosis or cirrhosis.

Treatment Plan :

***Ayurvedic* Diet Plan:**[14]

The dietary guidelines provided by Jeena Sikho Lifecare Limited Hospital include the following key commendations:

a. Foods to be avoided:

- Do not consume wheat, refined food, milk and milk products, coffee and tea and packed food.
- Avoid eating after 8 PM.
- During solid consume as small bite and chew 32 times.

b. Hydration:

- During water intake, take sip by sip and drink slowly to ensure the amount of water intake each time.
- Drink about 1 liter of alkaline water 3 to 4 times throughout the day.
- Include herbal tea, living water and turmeric-infused water part of daily routine.

c. Millet Intake:

- Incorporate five types of millet into your diet: Foxtail (*Setariaitalica*), Barnyard (*Echinochloaesculenta*), Little (*Panicumsumatrense*), Kodo (*Paspalumscrobiculatum*) and Browntop (*Urochloa ramose*).
- Use only steel cook wares for preparing the millets
- Cook the millets only using mustard oil.

d. Meal Timing and Meal Structure:

1. Early Morning (5:45 AM): Herbal tea, curry leaves (1 leaf-1 min/5 leaves-5 min) along with raw ginger and turmeric.
2. Breakfast (9:00-10:00 AM): The patient had given steamed fruits (Seasonal), steamed sprouts (according to the season) and a fermented millet shake (4-5 types).
3. Morning Snacks (11:00AM): The patient had given Red juice (150 ml) and soaked almonds.
4. Lunch (12:30 PM - 2:00 PM): The patient had received Plate 1 and Plate 2. Plate 1 will include a steamed salad, while Plate 2 with cooked millet-based dish.
5. Evening Snacks (4:00 – 4:20 PM): Green juice (100-150 ml) along with 4-5 almonds.
6. Dinner (6:15-7:30 PM): The patient had served a steamed salad, chutney, and soup, as Plate 1, along with millet khichdi as Plate 2.

"यवाः कषायाः स्वाद्यास्ते,
लघवो ग्राहिणो हिताः।
श्लेष्मलवणमांसस्थैर्य
बलमेधाग्निवर्धनाः॥"

Bhavaprakasha Nighantu, Dhanyavarga, Verse on Yava (Barley)[15]

e. Fasting:

- It is advised to observe one-day fasting.

f. Special Instructions:

- Express gratitude to the divine before consuming foods or drinks.
- Sit in *Vajrasana* (a yoga posture) after each meal.
- 10 minutes slow walk after every meal.

g. Diet Types:

- The diet comprises salt-less solid, semi-solid and smoothie options.
- Suggested foods include herbal tea, red juice, green juice, a variety of steamed fruits, fermented millet shakes, soaked almonds and steamed salads.

II. Lifestyle Recommendations were-

(i) Include meditation for relaxation.

(ii) Practice barefoot brisk walk for 30 minutes.

(iii) Ensure 6-8 hours of quality sleep each night.

(iv) Adhere to a structured daily routine.

1. *Ayurvedic* Treatment Protocol:

Table No. 3 – *Ayurveda* Treatment Protocol

Date	*Ayurveda* Treatment
16/05/2024	Medh Cap 1BD *(Adhobhakta with KoshnaJala)*
	Asthiposhaka Vati 2 BD *(Adhobhakta with KoshnaJala)*
	Lipi Cap 1 BD *(Adhobhakta with KoshnaJala)*
	Dr Immune Tab 1 tab BD *(Adhobhakta with KoshnaJala)*
	Orthonil Syrup 15ml BD *(Adhobhaktaa with samamatra KoshnaJala)*
	DS powder ½ Tsp HS *(Nishikala with KoshnaJala)*

Date	*Ayurveda* Treatment
11/07/2024	Asthiposhaka Vati 2 BD *(Adhobhakta with KoshnaJala)*
	Lipi Cap 1 BD *(Adhobhakta with KoshnaJala)*
	Ciro Cap 1 BD *(Adhobhakta with KoshnaJala)*
	SypLivforte 15ml BD *(Adhobhaktaa with samamatraKoshnaJala)*

Date	*Ayurveda* Treatment
16/08/2024	Asthiposhaka Vati 2 BD *(Adhobhakta with KoshnaJala)*
	Lipi Cap 1 BD *(Adhobhakta with KoshnaJala)*
	Orthonil Syrup 15ml BD *(Adhobhaktaa with samamatraKoshnaJala)*
	Dr Immune Tab 1 tab BD *(Adhobhakta with KoshnaJala)*

Date	*Ayurveda* Treatment
30/09/2024	Medh Cap 1BD *(Adhobhakta with KoshnaJala)*
	Cough har churna 1/2tsp TDS *(Adhobhakta with KoshnaJala)*
	Syp Jeevan amrita 20ml BD *(Pragbhakta with samamatra Koshna Jala)*
	Liv DS Cap 1 capsule BD *(Adhobhakta with KoshnaJala)*
	SypBroncho 15ml BD *(Adhobhaktaa with samamatra KoshnaJala)*
	DS powder ½ Tsp HS *(Nishikala with KoshnaJala)*
	AarogyaVati 1BD *(Adhobhakta with KoshnaJala)*

Date	*Ayurveda* Treatment
11/11/2024	AarogyaVati 1BD *(Adhobhakta with KoshnaJala)*
	SamaVati 1 tab BD *(Adhobhakta with KoshnaJala)*
	Dr Liv Shuddhi Tab 1 tab BD *(Adhobhakta with KoshnaJala)*
	Syp Jeevan amrita 20ml BD *(Pragbhakta with samamatra KoshnaJala)*

Follow-Up and Outcomes

After 6 months of *Ayurvedic* treatment, the results that were seen are

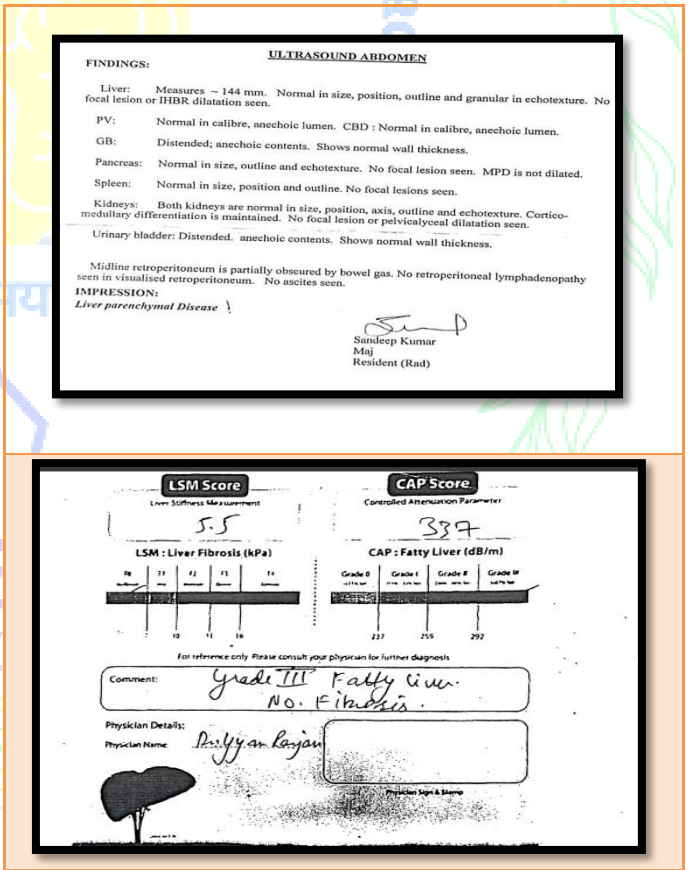
Table No. 4 – Outcomes – Objective Parameters

Parameters	Pre-Treatment	Post-Treatment
Alanine Aminotransferase (ALT):	95 U/L (indicative of liver stress/damage)	45 U/L (within normal range, indicating improved liver health)
CAP	337(Db/m)	238(Db/m)
FibroScan (Liver Stiffness):	5.5 kPa (not suggestive of notable fibrosis)	5 kPa (Slightly improved)
Fasting Blood Glucose:	150 mg/dL (indicative of poorly controlled diabetes)	120 mg/dL (improved but still above normal, reflecting better but not ideal glycaemic control)
USG Parameter Values	liver measure ~144mm, Granular in echotexture consistent with Liver Parenchymal Disease (grade 3 fatty liver disease).	~127mm, Normal echotexture suggestive of a normal scan.

The changes in the subjective parameters that was observed are

Table No. 5- Outcomes – Subjective Parameters

Parameters	Pre-Treatment	Post-Treatment
Fatigue Levels:	The patient reported significant fatigue, impacting daily activities.	The patient experienced considerably less fatigue, enhancing quality of life and activity levels.
Right Upper Quadrant Pain:	The patient frequently experienced discomfort and dull pain in the right upper abdominal area.	The patient reported a significant reduction in abdominal discomfort, only occasionally feeling mild pain.
Appetite Changes:	The patient noted a poor appetite, often felt nauseous after eating.	The patient's appetite was improved substantially, with nausea greatly diminished.


ULTRASOUND ABDOMEN

FINDINGS:

Liver: Measures ~ 144 mm. Normal in size, position, outline and granular in echotexture. No focal lesion or IHBR dilatation seen.

PV: Normal in calibre, anechoic lumen. CBD : Normal in calibre, anechoic lumen.

GB: Distended; anechoic contents. Shows normal wall thickness.

Pancreas: Normal in size, outline and echotexture. No focal lesion seen. MPD is not dilated.

Spleen: Normal in size, position and outline. No focal lesions seen.

Kidneys: Both kidneys are normal in size, position, axis, outline and echotexture. Cortico-medullary differentiation is maintained. No focal lesion or pelvicalyceal dilatation seen.

Urinary bladder: Distended. anechoic contents. Shows normal wall thickness.

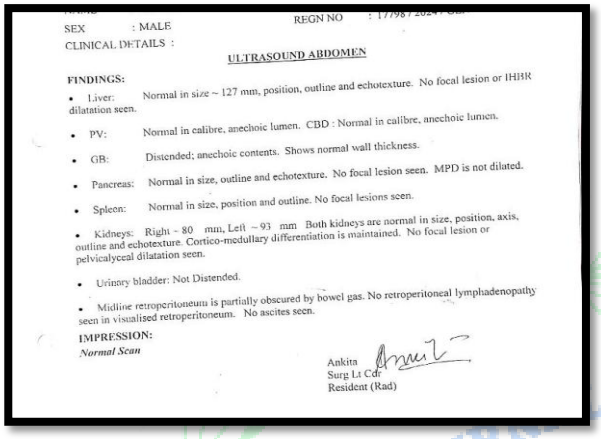
Midline retroperitoneum is partially obscured by bowel gas. No retroperitoneal lymphadenopathy seen in visualised retroperitoneum. No ascites seen.

IMPRESSION:

Liver parenchymal Disease

Sandeep Kumar
Maj
Resident (Rad)

Image 1: USG Before Treatment



SEX : MALE REGN NO :
CLINICAL DETAILS :

ULTRASOUND ABDOMEN

FINDINGS:

- Liver: Normal in size ~ 127 mm, position, outline and echotexture. No focal lesion or IHBR dilatation seen.
- PV: Normal in calibre, anechoic lumen. CBD : Normal in calibre, anechoic lumen.
- GB: Distended; anechoic contents. Shows normal wall thickness.
- Pancreas: Normal in size, outline and echotexture. No focal lesion seen. MPD is not dilated.
- Spleen: Normal in size, position and outline. No focal lesions seen.
- Kidneys: Right ~ 80 mm, Left ~ 93 mm Both kidneys are normal in size, position, axis, outline and echotexture. Cortico-medullary differentiation is maintained. No focal lesion or pelvicalyceal dilatation seen.
- Urinary bladder: Not Distended.
- Midline retroperitoneum is partially obscured by bowel gas. No retroperitoneal lymphadenopathy seen in visualised retroperitoneum. No ascites seen.

IMPRESSION:
Normal Scan

Ankita
Surg Lt Cdr
Resident (Rad)

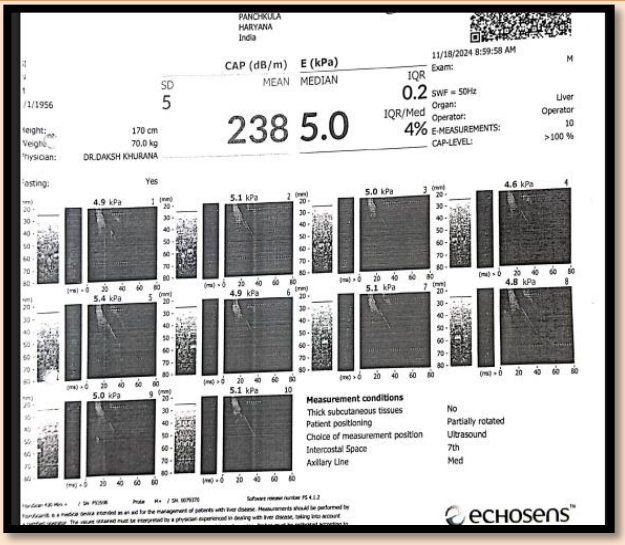


Image 2: USG After Treatment

Mechanism of Action of the medicines

1. **AsthiposhakVati -** "AsthiPoshakVati" is an *Ayurvedic* formulation specifically designed to support bone health and tissue regeneration. This *ayurvedic* compound includes elements like *Godanti* (Gypsum), which is known for its high calcium content and helps in bone fortification. *ShudhShilajit* is rich in minerals and aids in enhancing the bioavailability of other nutrients essential for bone metabolism and overall rejuvenation. *Ashwagandha* serves as a stress reliever and has anti-inflammatory properties, which are crucial in maintaining overall bone and joint health. *Hadjorh* (*Cissus quadrangularis*), the star ingredient, is widely recognized for accelerating bone healing, enhancing calcium absorption and generally strengthening the skeletal system. *Tabaqsheer* (*Bambusa arundinacea*) and *Pippali* (*Long pepper)* improves nutrient assimilation and boosts overall digestive and respiratory health, indirectly supporting bone health. *AmbaHaldi* (*Curcuma amada)* contributes anti-inflammatory and antioxidant properties, protecting tissues including bones from oxidative stress and inflammatory damage. Together, these ingredients make AsthiPoshakVati a comprehensive bone health supplement that not only strengthens bones but also enhances joint mobility and helps in the repair and regeneration of damaged tissues.
2. **Lipi Cap -** "Lipi Capsules" are formulated with a comprehensive blend of *Ayurvedic* herbs and minerals targeted at enhancing lipid metabolism and supporting cardiovascular health. Key ingredients include *Arjuna*, known for its cardioprotective properties, and *Guggulu*, which is effective in managing cholesterol levels. *Haridra* (turmeric) and *Amla* (Indian gooseberry) provide potent anti-inflammatory and antioxidant benefits, helping to reduce oxidative stress and improve overall heart health. *Bhumiamla* and *Guduchi* strengthen liver function, crucial for effective lipid metabolism.

Ingredients like *Sunthi* (ginger), *Kali Mirch* (black pepper) and *Pippali* (long pepper)

3. improves digestion and absorption of nutrients, enhancing the efficacy of other ingredients. *Mulethi* (licorice) and *Jatamansi* have stress-reducing properties, while *Punarnava* supports kidney function and fluid balance. The mineral components like *MuktaPishti* (pearl calcium), *AbhrakBhasma* and *ShankhaBhasma* aids in calming the mind and improving overall mineral balance in the body. Altogether, Lipi Capsules offers a holistic approach to manage lipid levels and enhance cardiovascular health.
4. **Ciro Cap** - Ciro Cap, a formulated *Ayurvedic* supplement, is specifically designed to support liver health and digestive functioning. Its diverse ingredient works synergistically to enhance liver detoxification, manage inflammation and to promote overall liver rejuvenation. *Kutki* and *Punarnava* are well-known for their hepatoprotective properties, enhancing liver function and aiding in the detox process. *Gokhru* and *Arjuna* improves urinary tract health and cardiovascular functions, respectively, supporting the body's natural cleansing systems. *Pudina* and *Sounf* offers relief from digestive discomfort, enhancing digestion and soothing the stomach. *ShankhBhasma*, a mineral-based component, aids in balancing acidity and improving gastrointestinal health. Together, these ingredients make Ciro Care a comprehensive formulation aimed at strengthening liver function, supporting detoxification processes and maintaining efficient digestive health.
5. **AarogyaVati** - ArogyaVati effectively enhances overall health and immunity through its multi-ingredient formulation. The mixture of *ayurvedic* proprietary herbs like *Triphala (Amalaki, Haritaki and Vibhitak)* promotes detoxification and rejuvenates all body tissues. Minerals like *LohBhasma, AbhrakBhasma* and *TamraBhasma* contributes to improve haemoglobin levels, cellular health and potent anti-inflammatory effects. *Chitrak* and *Kutki* bolsters the digestive health and liver functions, enhancing metabolic processes and toxin removal. *NimbaPatra* offers antimicrobial and detoxifying capabilities, helps to purify the blood and maintain skin health. This synergistic action makes ArogyaVati an effective medication for boosting vitality and fortifying the body's defences.
6. **Syp Jeevan Amrit-** "JeevanAmrit Syrup" is a nourishing *Ayurvedic* tonic designed to enhance overall health and vitality. The formulation combines several potent herbs known for their rejuvenative properties. *Harad* (*Terminalia chebula*) is a key ingredient renowned for its detoxifying effects, helps to cleanse the digestive system and improve its function. *Amla* (*Emblica officinalis*) is exceptionally high

in vitamin C and acts as a powerful antioxidant, which supports immune functions and promotes skin health. *Tulsi* (*Holy Basil*) is included for its adaptogenic properties, enhancing the body's ability to resist stress and providing support for respiratory health. *Baheda* (*Terminalia bellirica*) works synergistically with *Harad* and *Amla* to enhance digestive health and also contributes to respiratory well-being. *Pudina* (Mint) is added for its cooling and soothing effects on the stomach, aiding in digestion and offering relief from inflammation. Together, these ingredients make JeevanAmrit Syrup a versatile tonic that supports digestive health, bolsters the immune system and enhances overall vitality.

7. **Liv DS cap** - "LIV-DS Capsules" are crafted to support liver health and for detoxification, formulated with a blend of potent *Ayurvedic* proprietary herbs known for their hepatoprotective properties. *Bhumiamla* (*Phyllanthus niruri*) and *Kasani* (Chicory) are central to the formula, widely recognized for their effectiveness in liver detox and repair. *Himsra* (*Capparis spinosa*) and *Punarnava* (*Boerhavia diffusa*) are known to promote reduction of liver inflammation and managing fluid retention, respectively. *Guduchi* (*Tinospora cordifolia*) strengthens immune functions and combats liver toxins. *Kakamachi* (black nightshade) is another critical component, known for supporting liver function and protecting against hepatotoxicity. *Arjuna* (*Terminalia arjuna*) adds cardiovascular support, vital for overall systemic health. Other ingredients . like *Chitraka* (*Plumbago zeylanica*) and *Kutki* (*Picrorhiza kurroa*) enhance digestion and metabolism, supporting the liver's natural processing capabilities. Together, these components make LIV-DS an effective medicine for maintaining liver health, optimizing liver function, and promoting detoxification. As always, it's recommended to consult with a healthcare provider before starting new health supplements, especially when dealing with liver-related health issues.

8. **SamaVati** - "SamaVati" is an *Ayurvedic* formulation composed of various *ayurvedic* proprietary herbs and minerals that works synergistically to enhance overall health and vitality. The composition includes *Gokshura* and *Talmakhana*, which supports urinary and reproductive health, respectively, while *Kaunch* and *Musli* serves as potent aphrodisiacs and vitality boosters. *Shatavari* and *Vidarikand* provide nourishing properties, particularly beneficial for the reproductive system and general bodily strength. *Ashwagandha* and *ShilajitShudh* are known for their adaptogenic and rejuvenating effects, helping the body to cope up with stress and bolstering general wellness. Additional components like *Amalaki* and *Jaiphal* boosts immunity and aids digestion, respectively, while *Sonth* and *Beejband*

offer anti-inflammatory benefits. This combination not only supports reproductive and hormonal health but also enhances immune functions, promotes liver health and improves overall energy levels. Always consult a healthcare provider before starting any new treatment to ensure its appropriateness for specific health conditions.

9. **Dr Liv Shuddhi cap**- Dr. Liv Shuddhi Cap is an *Ayurvedic* formulation designed to detoxify and rejuvenate the body's internal systems. Key ingredients such as *Aamlaki* and *Haritaki* contributes powerful antioxidant properties that aids in cellular protection and detoxification. *Kutki, Kalmegha* and *Punarnava* are known for their hepatoprotective effects, enhancing liver function and promoting the removal of toxins. *Guduchi* strengthens the immune system, while *Tulsi* provides anti-inflammatory and antimicrobial benefits, further supporting the body's defence mechanisms. *Chitrak* and *Vidang*stimulates digestion, assisting in efficient nutrients absorption and metabolism. *Arjuna* adds cardiovascular support by improving heart health. This combination of detoxifying herbs supports overall wellness by cleansing the body, promoting better organ function and strengthening immune response, crucial for maintaining health and preventing disease.

10. **Orthonil syp** - Orthonil syrup is an *Ayurvedic* tonic formulated primarily to address joint pain and inflammation, enhancing overall musculoskeletal health. The comprehensive mixture includes anti-inflammatory herbs such as *RasnaPatra, Devdaru* and *Peepal* which helps to reduce joint and muscle inflammation. *Ashwagandha* and *Gokhru* supports muscle strength and endurance, while *Punarnava* aids in reducing swelling and fluid retention around joint areas. *Sonth* (dry ginger) and *Nagarmotha* enhances circulation and metabolic heat, which can help to alleviate pain. *Giloy* is known for its immunomodulatory effects, enhancing overall body resilience against chronic pain conditions. Honey acts as a natural sweetener and carrier, helps to improve the taste and bioavailability of *ayurvedic* constituents. This blend targets the root causes of joint discomfort, promoting joint mobility, reducing pain and enhancing the body's natural healing processes

Discussion :

This case study highlights the potential of *Ayurvedic* medicine in managing advanced fatty liver disease (Grade 3 NAFLD), a condition with limited pharmacological interventions in modern medicine. The significant improvements in the patient's biochemical parameters, imaging findings and clinical symptoms underscore the efficacy of a comprehensive *Ayurvedic* treatment protocol targeting the pathophysiology of NAFLD.

NAFLD, particularly its advanced stages, are closely linked with metabolic syndrome, obesity and insulin resistance. In this case, the patient's sedentary lifestyle, poor dietary habits and metabolic comorbidities compounded the progression of fatty liver disease. Modern interventions often emphasize on lifestyle modifications, including dietary changes, weight reduction and glycaemic control, but fails to address deeper systemic imbalances. In this case study, the *Samprapti* or pathogenesis, of liver disease and related metabolic dysfunctions was effectively broken using a holistic *Ayurvedic* treatment protocol. The regimen included *ayurvedic* formulations like Nervine Cap, AsthiposhakaVati and Lipi Cap that targeted *Kapha-Pitta* imbalance and rejuvenated *Agni* (digestive fire), essential for lipid metabolism and enhancing hepatoprotective actions. *Panchakarma* therapies played a crucial role in detoxifying the body, eliminating *Ama* (toxins), thus facilitating liver regeneration and restoring metabolic balance. Dietary modifications further supported the normalization of physiological processes. Collectively, these interventions restored the *doshic* balance, enhanced liver structure and functions, reduced systemic inflammation and improved overall metabolic health, effectively breaking the cycle of disease. The *Ayurvedic* treatment protocol included a combination of *ayurvedic* formulations, *Panchakarma* therapies and dietary recommendations, specifically targeting *Kapha-Pitta dosha* imbalances and impaired *Agni* (digestive fire). Formulations such as **Medh Cap, AsthiposhakaVati and Lipi Cap** likely contributed to lipid metabolism regulation and hepatoprotection through their active phytochemical constituents. Studies suggests that herbs like ***Haritaki***, ***Amalaki*** and ***ShankhBhasma*** exhibits antioxidant, anti-inflammatory and hepatoprotective properties, which are beneficial in NAFLD management[16,17,18]. *Panchakarma* therapies, known for their detoxifying effects, were pivotal in eliminating systemic toxins (*Ama*), further supporting liver regeneration and metabolic balance[19]. The reduction in the liver size on USG (from 144mm to 127mm) and normalization of echotexture post-treatment reflects structural and functional restoration of the liver. Additionally, the improvement in liver enzymes (ALT reduction from 95 U/L to 45 U/L) indicates reduced hepatocyte injury. FibroScan findings (liver stiffness reduced to 5 kPa) supports mild fibrosis reversal, consistent with previous research on the regenerative potential of *Ayurvedic* interventions in hepatic disorders[20,21].

The reduction in fasting glucose levels (from 150 mg/dL to 120 mg/dL) and subjective improvements, such as alleviated fatigue and abdominal discomfort, further highlights the systemic benefits of *Ayurvedic* treatment. The incorporation of **Cough Har Churna, AarogyaVati, and SamaVati**, known for their metabolic and anti-inflammatory properties, likely contributed to these outcomes[22].

This case aligns with studies exploring the impact of *Ayurvedic* herbs and formulations on NAFLD. Research by Gupta et al. demonstrated the hepatoprotective effects of **Phyllanthusemblica *(Amalaki)*** in reducing hepatic steatosis[23]. Another study by Sharma et al. highlighted the

lipid-lowering and antioxidant potential of **Terminaliachebula *(Haritaki)*** and **Terminaliabellirica *(Vibhitaki)*** in animal models of NAFLD[24].Although promising, these findings necessitates further research, including randomized controlled trials, to substantiate the role of *Ayurveda* in advanced NAFLD management. The *Ayurveda* with modern diagnostic tools and lifestyle interventions could offer a comprehensive strategy for addressing the growing burden of NAFLD worldwide.

Need for further research

While the results of this case study indicate promising outcomes in managing NAFLD using *Ayurvedic* approaches, further research is needed to strengthen the evidence base. Comprehensive, controlled clinical trials with larger sample sizes are essential to validate the efficacy and safety of the specific *ayurvedic* formulations and *Panchakarma* therapies used. Additionally, deeper investigations into the molecular mechanisms of how these treatments affects liver pathology and metabolism would provide valuable insights. It is also crucial to examine the long-term impacts of such treatments on liver health and overall metabolic functions to ensure sustainable and scalable application in broader patient populations.

Conclusion :

In conclusion, this case study highlights the successful management of Grade 3 non-alcoholic fatty liver disease (NAFLD) in a 68-year-old male using a comprehensive *Ayurvedic* approach. Initially presented with concerning vital signs such as a BMI of 29 kg/m² and blood pressure of 120/80 mmHg, the patient also exhibited symptoms indicative of advanced liver disease, including right upper abdominal discomfort, fatigue and mild hepatomegaly. The integrative treatment plan employed not only targeted these symptoms but also addressed the underlying pathophysiological aspects of NAFLD. Following a regimen of tailored *Ayurvedic* medications, along with specific *Panchakarma* therapies and dietary modifications, substantial improvements were observed. Key investigational findings supported these clinical improvements, with Ultrasound report suggests of Normal scan after 7 months of treatment and FibroScan results showing a reduction in liver size and stiffness CAP values reduced from 337(Db/m) to 238(Db/m) and E kPa values reduced from 5.5 kPa to 5 kPa, and biochemical profiles indicating normalized liver function and improved glycaemic control.

This case underscores the potential of *Ayurvedic* medicines in treating complex chronic diseases like NAFLD by holistically optimizing body functions and addressing the root causes of the disease. This integrative approach, combining personalized treatment regimens with conventional diagnostic tools, offers a promising pathway for enhancing patient outcomes in liver diseases and potentially other related metabolic disorders.

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