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## EFFICACY OF POLYHERBAL UNANI INTERVENTION IN MANAGING METABOLIC DYSFUNCTION-ASSOCIATED STEATOTIC LIVER DISEASE (MASLD): A CASE REPORT

Sana<sup>1\*</sup>, Mohammad Akhtar Siddiqui<sup>2</sup>

<sup>1</sup>MD Scholar, Department of Tahaffuzi wa Samaji Tib (Community Medicine), School of Unani Medical Education and Research, Jamia Hamdard, New Delhi, India.

<sup>2</sup>MD Moalajat (Medicine), Senior Consultant Physician, Royale Kalindi Hospital, New Delhi, India.

**\*Corresponding Author: Sana**

Email ID: [kvsana47@gmail.com](mailto:kvsana47@gmail.com)

### Abstract

**Background:** MASLD is defined as the presence of excess triglyceride storage in the liver in the presence of at least one cardiometabolic risk factor. The term MASLD comprises different conditions, including isolated liver steatosis (metabolic dysfunction-associated steatotic liver, MASL), metabolic dysfunction-associated steatohepatitis (MASH), as well as fibrosis and cirrhosis. MASLD is the most common chronic liver disease worldwide, yet no FDA-approved pharmacotherapy exists for its management. Unani medicine, with its rich pharmacopoeia of hepatoprotective and metabolic-regulating herbs, offers a potential therapeutic avenue. This report presents a case study of MASLD with significant liver stiffness that responded favorably to a polyherbal Unani regimen. **Case Description:** A 40-year-old woman with Transient Elastography (Fibroscan) confirmed MASLD presented with right hypochondrial pain, anorexia, insomnia, paresthesia, and fatigue. She was treated with a polyherbal Unani formulation for eight months, alongside lifestyle advice. Post-treatment, she showed complete clinical recovery and a marked reduction in liver stiffness on repeat Fibroscan. Liver enzymes normalized, and no adverse events occurred.

**Conclusion:** This case suggests that polyherbal Unani therapy may reverse fibro-inflammatory changes in MASLD, potentially offering a safe and effective alternative. Rigorous clinical trials are warranted to confirm these observations and establish standardized protocols.

**Keywords:** MASLD, *Waram al-Kabid Balghami*, Unani medicine, Hepatoprotective drugs.

## INTRODUCTION

The most current term for steatotic liver disease connected to metabolic syndrome is metabolic dysfunction-associated steatotic liver disease (MASLD). MASLD has the highest rate of liver-related illness and mortality and is the most common cause of chronic liver disease. (1) Its development has been driven by lifestyle changes, overeating, and lack of exercise. MASLD is associated with metabolic disorders and is often associated with obesity. (2) T2DM acts as an independent risk factor for both advanced liver fibrosis and MASH. Though innovative anti-hyperglycemic drugs appear to offer benefits, no medication has yet received approval for treating MASLD, even though lifestyle changes remain the foundation of patient management. (1)

“According to the Unani medical system, MASLD can be researched under the terms *Su’ Mizaj-i-Kabid Barid* (altered cold temperament of liver) and *Waram al-Kabid Balghami* (phlegmatic hepatitis)”. The liver's temperament (*mizaj*) changes from hot and moist to cold (*barid*) due to the erratic eating habits and consumption of fatty foods. (3) Inadequate food digestion (*Fasad al-Hadm*) results in the development of aberrant humors (*Akhlat-e-Radia*), especially thick phlegm (*Balgham-e-Ghaleez*), which accumulates in the liver and causes fatty change (*tashahhum*). (4) This disorder impairs absorptive faculty (*Quwwat Jadhiba*) and digestive faculty *Quwwat Hadima*, resulting in the signs and symptoms of the sickness.(3)

Furthermore, *Waram al-Kabid Balghami*, an inflammatory disease that affects the liver and may cause liver tissue to enlarge, may be linked to the illness. If left untreated, this illness progresses into a complicated form that could be connected to MASLD. (3)

A crucial phase in the development of MASLD is metabolic dysfunction-associated steatohepatitis (MASH), which dramatically raises the risk of cirrhosis, hepatocellular carcinoma (HCC), and liver-related death. (5) Chronic liver inflammation causes cirrhosis, which ultimately results in liver failure. (6)

The symptoms of liver cirrhosis are mentioned under term *Salaba al-Kabid* in Unani literature. “*Waram al-Kabid Barid Sawdawi*” / “*Taleef-ul-Kabid*” are also mentioned in Unani literature, describing the numerous symptoms similar to liver cirrhosis. (7) To treat “*Salaba al-Kabid*,” many single and compound drugs are evident in Unani medicine. Such as *Zanjabeel*, *Kasni*. (8)

## Case description

A 40-year-old female with a confirmed diagnosis of MASLD, obesity, and obstructive sleep apnea presented to the Outpatient Department of Royale Kalindi Hospital, Delhi, seeking an alternative treatment option. Her medical history was significant for type 2 diabetes mellitus, for which she had been receiving insulin therapy for the past seven years (Insugen-R, 18 units three times a day). Additionally, she had been receiving levothyroxine (Thyronorm, 25 µg, once daily) for the past 10 years for hypothyroidism. The patient also had a history of fistulectomy performed one year prior to presentation. Her family history was not significant, nor was she addicted to smoking and alcoholism.

General physical examination revealed an obese individual weighing 91.5 kg, with a height of 158 cm and a calculated BMI of 36.8 kg/m<sup>2</sup>. Her vital parameters were stable, including a blood pressure of 130/90 mmHg, pulse rate of 80 beats per minute, respiratory rate of 16 breaths per minute, and a body temperature of 98°F.

## Diagnostic assessment

The preliminary laboratory investigations revealed hyperglycemia and elevated transaminase levels, with a total bilirubin of 0.6 mg/dL, alanine aminotransferase (ALT) of 62 U/L, and aspartate aminotransferase (AST) of 72 U/L. Triglyceride level was 254 mg/dL. Serological markers for hepatitis B (HBsAg) and hepatitis C (anti-HCV) were negative. Transient elastography (Fibroscan) showed a controlled attenuation parameter (CAP) of 301dB/m and a liver stiffness measurement of 13.2 kPa, indicating significant hepatic steatosis and advanced liver fibrosis. Her glycated hemoglobin (HbA1c) level was 10%, reflecting poor glycemic control. Abdominal computed tomography (CT) revealed changes consistent with chronic liver disease (CLD), including hepatosplenomegaly, hepatic steatosis, and features suggestive of mild portal hypertension.

## Consent

To be part of the study, informed consent was taken willingly from the patient.

## Lifestyle and Dietary Intervention

As part of the non-pharmacological intervention, the patient received structured lifestyle counselling. She was advised to engage in a daily 20-minute brisk morning walk and to gradually increase her overall physical activity levels while minimizing prolonged sitting. Dietary modifications included restriction of refined sugars and adoption of a calorie-restricted diet (*Taqlil-i-Ghidha*), emphasizing whole grains, green leafy vegetables, and legumes. Intake of red meat and high-fat animal products was reduced.

Inclusion of dried fruits such as *Anjeer* (*Ficus carica*) and *Maweez Munaqqa* (*Vitis vinifera*) was encouraged, as recommended in classical Unani texts. (9)

## Drug Intervention

The intervention was administered over 8 months, with monthly follow-up visits.

The compound Unani formulations mentioned in Classical Unani texts, are prescribed orally as Majoon Dabeed-ul-ward 10 grams, Sharbat-e-Deenar 20 ml, Habbe Ayarij (*Ayariz fiqra*) 3 tablets, (10) Arq Baranjasif 60 ml, (11) as shown in Table 1.

**Table 1: Compound Unani formulations with dose, duration and main ingredients**

| Drug                  | Dose              | Duration                 | Main Ingredient                                   |
|-----------------------|-------------------|--------------------------|---------------------------------------------------|
| Majoon Dabeed-ul-ward | 10 grams          | Twice daily              | <i>Gul-e-Surkh</i> ( <i>Rosa damascena</i> )      |
| Arq Baranjasif        | 60 ml             | Twice daily              | <i>Baranjasif</i> ( <i>Achillea millefolium</i> ) |
| Sharbat-e-Deenar      | 20 ml             | Twice daily              | <i>Tukhm-e-Kasoos</i> ( <i>Cuscuta reflexea</i> ) |
| Habbe Ayarij          | 3 tablets         | Once daily<br>At night   | <i>Ayariz faiqra</i> ( <i>Aloe vera</i> )         |
| Safoof Munzij         | 20 grams          | Once daily<br>At morning | Ingredients mentioned in Table 2                  |
| Zamad Jalinus         | Local application | Once daily<br>At night   | Ingredients mentioned in Table 3                  |

The Safoof Munzij containing drugs *Afsanteen*, *Gaozaban*, *Baranjasif* -5 grams each, *Bekh-e-kasni*, *Badiyan*, *Mako*, *Gul-e-Banafsha*-7grams each (12) shown in Table 2, are advised to immerse in 250 ml of water, the whole night. The following morning, the decoction (*Joshanda*) was prepared over low heat using standard methods. (12)(13) Once filtered, the patient was instructed to drink it once a day before breakfast for 30 days.

**Table 2: Ingredients of Safoof Munzij**

| Drug         | Botanical name                               | Action                                                                     |
|--------------|----------------------------------------------|----------------------------------------------------------------------------|
| Gaozaban     | <i>Borago officinalis</i> L.<br>(Borage)     | Anti-inflammatory, Antioxidant, Antispasmodic (14)                         |
| Bekh-e-kasni | <i>Cichorium intybus</i><br>(Chicory)        | Anti-inflammatory, Anti-oxidant (15)                                       |
| Afsanteen    | <i>Artemisia absinthium</i><br>(Wormwood)    | Hepatoprotective, Appetizer (16)                                           |
| Baranjasif   | <i>Achillea millefolium</i> Linn<br>(Yarrow) | Hepatoprotective, Anti-inflammatory, Anti-diabetic (17)                    |
| Mako         | <i>Solanum nigrum</i><br>(Black Nightshade)  | Anti-inflammatory, Anti-cancerous, Hepatoprotective, Immuno-stimulant (18) |
| Badiyan      | <i>Foeniculum vulgare</i><br>(Fennel Seeds)  | Anti diabetic, Anti-inflammatory, Anxiolytic (19)                          |
| Gul Banafsha | <i>Viola odorata</i><br>(Sweet Violet)       | Anti-inflammatory, for shortness of breath, Anti-dyslipidemic (20)         |

### Local application

Zamad Jalinus application on right hypochondrium at night is prescribed.

**Table 3: Ingredients of Zamad Jalinus**

| Drug                                         | Action                                                                         |
|----------------------------------------------|--------------------------------------------------------------------------------|
| Zanjabeel<br>( <i>Zingiber officinale</i> )  | Anti-inflammatory (21)                                                         |
| Jaosheer<br>( <i>Ferula galbaniflua</i> )    | Antioxidant, Antimicrobial, Anti-inflammatory (22)                             |
| Sibr Zard<br>( <i>Aloe barbadensis</i> )     | Purgative (Phlegm/Bile), Hepatotonic, and Anti-inflammatory (23)               |
| Ganda Behroza<br>( <i>Pinus longifolia</i> ) | Emollient, Anti-inflammatory, Wound healing (24)                               |
| Roghan Sosan<br>( <i>Iris ensata</i> )       | Relaxation and an emollient oil<br>Tissue soothing, Resolvent & Analgesic (25) |
| Mom<br>(Beeswax)                             | Antimicrobial (26) Anti- inflammatory, Sedative (27)                           |

## Outcome and follow up

Following a six-month follow-up period, the patient's right hypochondrial pain and bilateral paresthesias of the hands and feet had completely subsided. Subjective improvements were also noted in appetite, fatigue, and sleep quality.

At baseline, the patient exhibited elevated liver enzymes, poor glycemic control (HbA1c 10%), obesity (BMI 36.8 kg/m<sup>2</sup>), hepatosplenomegaly, fatty liver, and significant liver stiffness on Fibro Scan.

After eight months, Liver function tests normalized, with AST decreasing from 72 U/L to 34 U/L and ALT from 62 U/L to 42 U/L (Table 4). Transient elastography (Fibroscan) findings demonstrated a reduction in liver stiffness from 13.2 kPa to 8.7 kPa and CAP value from 301 to 281 (Table 5) (Figure 1), indicating improvement in hepatic fibrosis and steatosis. Additionally, glycemic control improved, with HbA1c declining from 10% to 7.8% (Figure 2), accompanied by reductions in fasting and postprandial blood glucose levels. (Table 6)

Weight reduction, a key therapeutic goal in MASLD management, was also achieved, with the patient's weight declining from 91.5 kg at baseline to 82 kg by the eight-month follow-up.

**Table 4: Liver Function Test**

| Test | Reference range (In U/L) | Base-line | 1st follow-up | Last follow-up |
|------|--------------------------|-----------|---------------|----------------|
| AST  | 10-40                    | 72        | 38            | 34             |
| ALT  | 7- 45                    | 62        | 69            | 42             |

**Table 5: Transient Elastography report**

| Parameter             | Pre-treatment | Post-treatment |
|-----------------------|---------------|----------------|
| Liver Stiffness (kPa) | 13.2          | 8.7            |
| CAP/UAP (dB/m)        | 301           | 281            |

**Table 6: Glycemic Profile**

| Investigation  | 1st Follow-up | Last Follow-up |
|----------------|---------------|----------------|
| HbA1C (%)      | 10.0          | 7.8            |
| BSL-PP (mg/dL) | 274           | 134            |
| BSL-F (mg/dL)  | 184           | 119            |

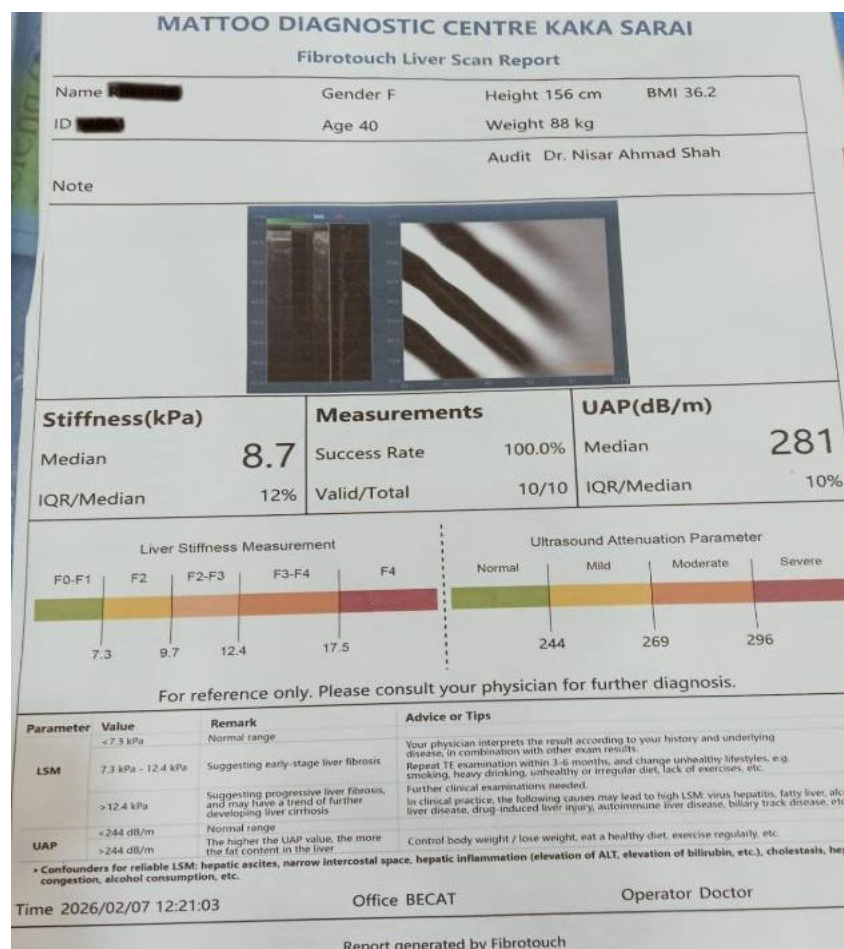


Figure 1: Transient Elastography reports pre and post treatment.

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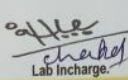
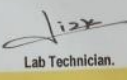
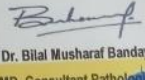
Reg. No: DHK/Reg/19/2012

Patient's Name : [REDACTED] Patient ID : [REDACTED]  
 Age / Gender : 40 Yrs. Female Collection Date : 19/03/2026 09:48 AM  
 Ref. By : SELF Received Date : 19/03/2026 09:46 AM  
 Patient's Adrs : ZEWAN Reporting Date : 19/03/2026 02:02 PM

| Test Name                              | Observed Value | Unit  | Reference Range                                                                                                                         |
|----------------------------------------|----------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <b>GLYCOSYLATED HEMOGLOBIN (HbA1c)</b> |                |       |                                                                                                                                         |
| HbA1c                                  | 7.8            | %     | Below 6.0% - Normal value                                                                                                               |
| Mean Blood Glucose                     | 177.16         | mg/dl | 90-120 - Excellent Control<br>121-150 - Good Control<br>151 - 180 - Average Control<br>181-210 - Action Suggested<br>>211 - Panic Value |

Method : TEST HAS BEEN PERFORMED ON FULLY AUTOMATIC BIOCHEMISTRY ANALYSER EM200

Glycosylated Haemoglobin is a accurate and true index of the "Mean Blood Glucose Level" in the body for the previous 2-3 months. HbA1c is an indicator of glycemic control. HbA1c represents average glycemia over the past six to eight weeks. Glycation of hemoglobin occurs over the entire 120 day life span of the red blood cell, but with in this 120 days. Recent glycemia has the largest influence on the HbA1c value. Clinical studies suggest that a patient in stable control will have 50% of their HbA1c formed in the month before sampling, 25% in the month before that, and the remaining 25% in months two to four.

 Lab Incharge.
  Lab Technician.
  Dr. Bilal Musharaf Bandy  
 MD, Consultant Pathologist

Gousia Shifakhana & Diagnostic Centre  
 Sarai Payeen Maharaja Bazar, Amira Kadal, Srinagar-190001  
 Reception No. : 0194-357 4671 E-mail: gshifakhana786@gmail.com

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**Figure 2: HbA1c result post-treatment**

## DISCUSSION

MASLD is a progressive liver disorder strongly associated with obesity, insulin resistance, type 2 diabetes mellitus, and other components of metabolic syndrome. The present case highlights the beneficial effects of a comprehensive Unani treatment regimen combined with lifestyle modification.

Following eight months of treatment, substantial clinical and biochemical improvements were observed.

From an Unani perspective, the prescribed formulations may have corrected the altered temperament (*Su' Mizaj-i-Kabid Barid Sawdawi*), improved hepatic function, and reduced inflammation.

The Unani drugs, such as *Afsanteen*, *Gauzaban*, *Baranjasif*, *Bekh-e-kasni*, *Badiyan*, *Mako*, *Gul-e-Banafsha*, have been reported to contain anti-inflammatory, immunomodulatory, hepatoprotective, anti-diabetic, anti-oxidant, hypolipidemic and analgesic properties in various animal studies. (14-20)

It is also mentioned in Unani Literature that *Salaba al-Kabid* that resemble Liver cirrhosis can be treated by *Badyan*, *Anisoon*, *Tukhm-e-Kasoos* and *Afsanteen* (12)

The compound Unani formulations have been used to treat liver disorders from ages.

**Majoon Dabeed-ul-ward** and **Sharbat-e-Deenar**: According to an in-vitro study, both formulations demonstrate their regenerative and protective qualities. (28)

**Sharbat-e- Deenar** has hepatoprotective and antioxidant properties against liver damage. (29) By elevating detrimental cytokines such as transforming growth factor - $\beta$  (TGF- $\beta$ ), interleukin-6 (IL-6), and tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ), oxidative stress promotes fibrogenesis. (30) In addition to preventing hepatocyte damage, antioxidants may potentially have direct antifibrogenic effects.(31)

**Habbe Ayarij**: Safoof Ayarij Faiqra, a powder blend primarily made of Aloe vera or *Aelwa*, is the main active ingredient of Habbe Ayarij.

*Ayarij Faiqra* a traditional Unani medication, along with a number of other active herbal and mineral components with strong therapeutic qualities, including *Mudammile Qurooh*, *Mujaffife Qurooh*, *Mohallil*, *Dafe ufoonat* , *Jaali*, and *jazib* such as *Sibr*, *Darcheeni*, *Asaarun*, *Balchhar*, and *Mustagee*(32)

Its purgative (*Mushil*) treatments are also employed as a systemic agent to remove waste humors from all bodily areas, including arteries and membranes. (33)

**Arq Baranjasif**: In vivo research on *Baranjasif* revealed that the methanolic extract of *Achillea millefolium* (*Baranjasif*) had a hepatoprotective impact on carbon tetrachloride-induced hepatotoxicity in rats. It also showed a notable reduction in liver enzymes and hepatic cell regeneration, most likely because it contained flavonoids. (34)

Following the initiation of the Unani intervention alongside her existing insulin therapy, the patient's glycemic control improved, as evidenced by a reduction in HbA1c from 10% at baseline to 7% at follow-up.

The Anti-diabetic and hypolipidemic qualities of medications like *Baranjasif* and *Badyan*, *Gul Banafsha*, *Ayarij* (17,19,20,33) may be the cause of the weight loss and hypoglycemia along with diet and lifestyle modification.

The patient lost approximately 9.5 kg during the study period, which is consistent with evidence suggesting that a weight loss of 7.8–10% can significantly improve hepatic steatosis and

metabolic parameters in MASLD (35). Lifestyle interventions, including dietary restriction and regular physical activity, likely contributed substantially to these benefits.

Zamad Jalinus, is an Unani ointment applied topically for its anti-inflammatory and wound healing properties for internal organs and joint. However, as this is a single case report, causal relationships cannot be definitively established. Larger controlled clinical studies are required to validate the efficacy and safety of these interventions in MASLD management.

## CONCLUSION

A challenging metabolic syndrome cluster is represented by the patient's co-occurring diabetes, obesity, OSA (Obstructive Sleep Apnea phenotype), and MASLD (Metabolic Dysfunction-Associated Steatotic Liver Disease). Within eight months, there was a noticeable change in Fibro Scan, representing Unani therapy may be a promising adjunctive option to counter the growing burden of MASLD, warranting further rigorous clinical trials.

**Conflict of interest:** None

**Source of support:** None

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