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Review Article

The Comprehensive Review of the Preventive facet of Fatty Liver Disease under the Paradigm of Unani Medicine

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Abstract

The liver, recognized as the largest and most vital organ, plays a central role in maintaining the body's *Hararat-e-Ghariziya* (innate heat) according to the Unani system of medicine, which has a rich tradition in diagnosing and treating liver disorders. Fatty Liver Disease (FLD), or hepatic steatosis, is a reversible condition characterized by the abnormal accumulation of triglycerides within liver cells, resulting from various causes such as excessive alcohol consumption, obesity, insulin resistance, and metabolic dysfunction. Both alcoholic and non-alcoholic forms of FLD share similar histopathological features, including micro- and macrovesicular fatty changes, making clinical distinction challenging. Unani medicine attributes such liver imbalances to a disruption in the body's natural temperament and heat regulation, emphasizing prevention through lifestyle modifications, dietary management, and the use of hepatoprotective herbs. This review provides an integrative perspective on FLD, combining modern medical understanding with classical Unani principles to highlight effective preventive and therapeutic strategies rooted in traditional medicine.

Keywords: Fatty Liver Disease, Hararat-e-Ghariziya, Unani Medicine, Insulin Resistance, Hepatic Steatosis, Preventive Care

INTRODUCTION

The liver is a vital organ essential for sustaining life due to its size and involvement in numerous critical physiological processes. It plays a central role in maintaining the body's internal balance, particularly in fat metabolism, detoxification, and nutrient processing. Fatty liver, or hepatic steatosis, is a reversible condition resulting from the accumulation of triglyceride-filled vacuoles within liver cells. It is commonly seen in individuals with obesity, metabolic syndrome, or excessive alcohol consumption and is often associated with disturbed lipid metabolism and insulin resistance¹. Based on the presence or absence of significant alcohol use, fatty liver is classified into Alcoholic Steatosis and Non-Alcoholic Fatty Liver Disease (NAFLD). In severe cases, these conditions may progress to Alcoholic Steatohepatitis (ASH) or Non-Alcoholic Steatohepatitis (NASH), both of which can lead to liver fibrosis, cirrhosis, hepatocellular carcinoma, and eventually liver failure.

From the Unani (Greco-Arab) standpoint, the liver (*kabad*) is considered the chief organ responsible for the

production and regulation of *akhlat* (humors), which are vital for maintaining systemic health. Its normal function is governed by four intrinsic faculties: *quwat-e-jazibah* (absorptive), *quwat-e-hazimah* (digestive), *quwat-e-masikah* (retentive), and *quwat-e-dafiah* (expulsive). Any dysfunction in these faculties disrupts the *mizaj* (temperament) of the liver, leading to the accumulation of *mawad-e-fasida* (morbid matter). This accumulation reflects a parallel concept to steatosis in modern medicine. If the imbalance is simple (*saada*), it can be corrected with mild interventions, but in the case of a complex (*maddi*) imbalance, deeper pathological changes occur, akin to NASH or liver fibrosis. Thus, the Unani concept of humoral imbalance and faculty dysfunction closely mirrors the modern understanding of fatty liver disease progression².

ETIOLOGY

Liver fat buildup is frequently linked to excessive alcohol consumption or metabolic syndrome, which includes conditions like diabetes, high blood pressure, obesity, and abnormal lipid levels. This accumulation typically occurs

due to one or more of the following mechanisms: an increased influx of free fatty acids (FFAs) into the liver; heightened synthesis of fatty acids within the liver itself; reduced breakdown (oxidation) of FFAs, or impaired formation and release of very-low-density lipoproteins (VLDL) responsible for transporting fat out of the liver ^{3,4}.

1. Metabolic Factors

- **Obesity and Insulin Resistance:** Central obesity and insulin resistance primarily contribute to NAFLD. Insulin resistance leads to increased free fatty acid influx into the liver, promoting triglyceride accumulation and hepatic steatosis ⁵.
- **Type 2 Diabetes and Dyslipidemia:** Elevated blood glucose and lipid levels worsen inflammation and fat accumulation in the liver, increasing the risk of progression to nonalcoholic steatohepatitis (NASH) and cirrhosis.

2. Environmental and Lifestyle Factors

- **Dietary Patterns:** High intake of simple carbohydrates, saturated fats, and processed foods contributes to caloric imbalance, leading to weight gain and liver fat accumulation ⁶.
- **Physical Inactivity:** Sedentary lifestyles exacerbate obesity and insulin resistance, increasing the risk of NAFL.
- **Sleep Deprivation:** Inadequate sleep is linked to metabolic disturbances, including insulin resistance and weight gain, which can contribute to NAFLD development ⁷.

3. Drugs and Toxins

Certain drugs, such as tamoxifen, diltiazem, Glucocorticoids, Amiodarone, and methotrexate, have been implicated in drug-induced fatty liver. Additionally, exposure to environmental toxins like phosphorus and certain hepatotoxins can lead to liver fat accumulation ⁸.

4. Genetic Predisposition

- **PNPLA3 Gene Variant:** The I148M polymorphism in the PNPLA3 gene is strongly associated with NAFLD severity. This variant impairs triglyceride breakdown, leading to fat accumulation in hepatocytes.
- **Ethnic Variations:** Hispanic populations exhibit a higher prevalence of the PNPLA3 variant, correlating with increased NAFLD risk, whereas African American populations show a lower prevalence despite higher obesity rates ⁹.

5. Medical Conditions

- **Polycystic Ovary Syndrome (PCOS):** Women with PCOS are at increased risk of NAFLD due to associated metabolic disturbances.
- **Obstructive Sleep Apnea:** This condition is linked to insulin resistance and liver fat accumulation.
- **Hypothyroidism and Hypopituitarism:** Endocrine disorders can contribute to metabolic abnormalities, increasing NAFLD risk ¹⁰.

EPIDEMIOLOGY:

Non-Alcoholic Fatty Liver Disease (NAFLD) has emerged as one of the most prevalent causes of chronic liver disease globally, affecting an estimated 25%–30% of the world population, with notable regional variations. The highest prevalence rates are observed in the Middle East and South America, where it reaches 32%–35 %, while Asia, particularly India and China, is witnessing a rapid rise in cases due to increasing urbanization and lifestyle transitions, with current estimates ranging from 25% to 30%. In Western countries like the United States and across Europe, NAFLD prevalence is reported between 24% and 30%, largely attributed to the high incidence of obesity and type 2 diabetes mellitus ^{11,12}. Specific subpopulations are disproportionately affected, such as obese individuals, among whom up to 80% may have NAFLD, and patients with type 2 diabetes, where prevalence ranges from 40% to 70%. Alarming, the disease is also becoming increasingly common in children and adolescents, with rates ranging from 10%–20% in the general pediatric population and reaching up to 38% in obese children ^{13,14}.

ETIOPATHOGENESIS OF FATTY LIVER IN UNANI PERSPECTIVE:

In Unani, fatty liver disease is not described by the modern term, but its features closely align with conditions like "Saman-e-Mufrit" (obesity), "Tashshum al-Kabid" (fatty infiltration of the liver), and "Sue Mizaj Kabid" (deranged temperament of the liver).

1. Derangement of Liver Temperament (Sue Mizaj Kabad)

- 1) The liver in Unani medicine is considered **hot and moist** in temperament (Har Ratb).
- 2) FLD is often a result of **cold and moist (Barid Ratb)** derangement.

3) Causes of Sue Mizaj Kabad include: -

- Overconsumption of cold, moist foods (e.g., dairy, fatty meats).
- A sedentary lifestyle leads to stagnation of metabolic processes.
- Excessive rest, oversleeping, and lack of physical exertion ¹⁵.

2. Accumulation of Balgham (Phlegmatic Humor)

- **Balgham**, being cold and moist, accumulates in the liver when digestion is weak (due to a cold temperament or digestive insufficiency).
- The improper digestion of food (Hazm ka Kharab Hona) leads to the formation of abnormal humors (Akhlat-e-Radia), particularly **Balgham-e-Ghaleez (thick phlegm)**, which is deposited in the liver, causing **tashshum** (fatty change) ¹⁶.

3. Obesity (Saman-e-Mufrit) and Liver Function

- Saman-e-Mufrit is both a cause and a consequence of liver derangement.

- The liver, being central to the formation of blood (dam), is overburdened in obesity, leading to deposition of excessive fatty matter.
- This excess matter settles in the liver parenchyma, akin to fatty infiltration ¹⁷.

4. Role of Quwā Tab'iyya

- The **Tabiyat** (body's inner wisdom) and **Quwā Hadima (digestive power)** play a central role in metabolizing food.
- Weak digestion leads to the production of **abnormal Akhlat**, which, instead of being assimilated or excreted, accumulate in tissues like the liver.
- If the **Quwā Dafia (expulsive faculty)** is impaired, the liver fails to excrete waste humors, promoting fatty deposition.

UNANI APPROACH TO PREVENTION OF FATTY LIVER DISEASE

The Unani system of medicine offers a comprehensive approach to preventing and managing fatty liver disease, known in Unani terminology as *Tashhhamul Kabid*. (18). This approach is grounded in the concepts of *Mizāj* (temperament) and *Su' Mizāj* (dys temperament), emphasizing the balance of bodily humors and lifestyle modifications.

In Unani medicine, the liver (*Kabid*) is considered to have a hot and moist temperament. Disruptions in this balance, due to factors like excessive intake of fatty foods, alcohol, or certain medications, can lead to a cold (*Barid*) or hot (*Haar*) temperament. Such imbalances result in the accumulation of morbid matter, manifesting as fatty liver disease (*Tashhhamul Kabid*) ¹⁹.

Preventive Strategies in Unani Medicine:

Lifestyle Modifications-

1. Ilaj-bil-Ghiza (Diet Therapy)

Diet plays a significant role in managing fatty liver, as irregular eating habits are a major contributing factor. Maintaining a balanced diet is essential, as both overconsumption and prolonged fasting can result in a *Su'mizaj barid* (cold temperament). Individuals with liver disorders are advised to avoid heavy, oily, spicy, fried, and difficult-to-digest foods. Instead, they should consume light and easily digestible meals, including preparations like bird or chicken soup, lentils, *sagodana kheer* (gruel made from *Metroxylon sago*), *daliya* (wheat porridge), as well as herbs such as *kishneez* (*Coriandrum sativum*) and *pudina* (*Mentha piperita*).

2. Ilaj-bit-Tadbeer (Regimental Therapy)

Mild therapeutic interventions are considered adequate for correcting *Su'mizaj barid kabid* (cold temperament of the liver). According to Alqamri, citing Jalinoos in *Ghina Muna*, engaging in *riyazat* (physical exercise), particularly brisk running, is beneficial as it helps reduce excess body weight. Additional supportive therapies include *hammam* (steam baths) and *dalk* (massage) over the liver area using oils or topical preparations like *Sibr* (aloe vera), *Zimad Jalinoos*, *Zimad Sunbulut Tib*, and *Roghan Afsanteen*. Moreover, *Hijama* (wet cupping) is employed to re-establish humoral balance and support hepatic function ^{20, 21, 22}.

3. Ilaj-bid-Dawa (Pharmacotherapy)

Depending on the specific site of liver involvement, appropriate pharmacological interventions are selected. If the condition affects the inferior (concave) side of the liver, light *muhallil* (anti-inflammatory) agents and purgatives may be used. When the superior (convex) side is involved, diuretics are especially beneficial. The Unani system offers a range of single and compound formulations for managing fatty liver, including both classical and pharmacopeial preparations.

Single Unani drugs are usually given in the form of decoction/powder ²³:

S.N.	Single Unani Drugs	Botanical Name	Family	Pharmacological Action
1.	Afsanteen	Artemisia absinthium	Asteraceae	Muqawwi-e-Meda (Stomachic – strengthens digestion) Munaqqi-e-Meda (Gastric cleanser) Mudirr-e-Baul (Diuretic) Mughalliz-e-Mani (Semen thickener) Muqawwi-e-Jigar (Hepatotonic – strengthens the liver)
2.	Darchini	Cinnamomum zeylanicum	Lauraceae	Muqawwi-e-Meda (Stomachic – strengthens digestion) Muqawwi-e-Qalb (Cardiotonic – strengthens the heart) Muqawwi-e-A'zaRaisa Munaffis-e-Balgam

				Daafi-e-Tashannuj (Antispasmodic) Muhallil-e-Waram (Anti-inflammatory – reduces swelling) Mudir-e-Baul (Diuretic)
3.	Ghafis	(Gentiana olivieri),	Gentianaceae	Muqawwi-e-meda (Stomachic – strengthens digestion) Munaqqi-e-kabd Mudirr-e-baul (Diuretic) Mufattih-e-sudad (Deobstruent) Muqawwi-e-kabid (Hepatotonic – strengthens the liver)
4.	Tukhm kasoos	(Cuscuta reflexa),	Convolvulaceae	Mudirr-e-Baul (Diuretic – promotes urination) Musaffi-e-Khoon (Blood purifier) Muqawwi-e-Kabid (Hepatotonic – strengthens the liver) Mushil (Mild purgative) Muqawwi-e-Dimagh (Brain tonic)
5.	Luk	(coccus lacca),	mineral origin drug	Muqawwi-e-Qalb (Cardiotonic – strengthens the heart) Muqawwi-e-A'asab (Nervine tonic – strengthens the nerves) Muqawwi-e-Dimagh (Brain tonic) Muqawwi-e-Bah (Aphrodisiac) Daf-e-Tashannuj (Antispasmodic)
6.	Zarawund tawil	(Aristolochia indica),	Aristolochiaceae	Muhallil-e-Waram (Anti-inflammatory – reduces swelling) Mufatteh-e-Sudad (Deobstruent – clears blockages) Mudirr-e-Haid (Emmenagogue – stimulates menstruation) Daf-e-Samoom (Antidotal – expels poisons) Jali (Detergent – cleanses wounds or skin)
7.	Hab-e-balsan	(Commiphora opobalsamum),	Burseraceae	Muhallil-e-Waram (Anti-inflammatory) Musakkin-e-Alam (Analgesic – pain reliever) Mufatteh-e-Sudad (Deobstruent) Muqawwi-e-A'zā (Tonic for organs) Mudirr-e-Baul (Diuretic)
8.	Uood garqi	(Aquilaria agallocha),	Thymelaeaceae	Muqawwi-e-A'asab (Nervine tonic) Muqawwi-e-Qalb (Cardiotonic) Muqawwi-e-Meda (Stomachic)

				Mufarreh (Exhilarant – mood enhancer) Musakkin (Sedative)
9.	Gul e surkh	(Rosa damascena),	Rosaceae	Muqawwi-e-Qalb (Cardiotonic – strengthens the heart) Mufarreh (Exhilarant – uplifts mood) Astringent (Qabiz – contracts tissues) Muqawwi-e-Meda (Stomachic – improves digestion) Musaffi-e-Khoon (Blood purifier)
10.	Makoy	(solanum nigrum),	Solanaceae	Muqawwi-e-Kabid (Hepatotonic – strengthens the liver) Munaqqi-e-Kabid (Liver detoxifier) Musaffi-e-Khoon (Blood purifier) Muhallil-e-Waram (Anti-inflammatory) Mild Musakkin (Sedative)
11.	Raiwand chini	(Rheum emodi)	Polygonaceae	Mushil (Purgative – promotes bowel movement) Muqawwi-e-Meda (Stomachic – strengthens the stomach) Munaqqi-e-Meda wa Kabid (Detoxifies stomach and liver) Musaffi-e-Khoon (Blood purifier) Daf-e-Tafun (Antiseptic)
12.	Mastagi	(Pistacia Lentiscus),	Anacardiaceae	Muqawwi-e-Meda (Stomachic) Daaf-e-Nafkh (Carminative – relieves gas) Qabiz (Astringent) Muqawwi-e-Asab (Nervine tonic) Mujaffif (Desiccant – dries moisture)
13.	Zaffran	(Crocus sativus),	Iridaceae	Mufarreh (Exhilarant – mood enhancer) Muqawwi-e-Qalb (Cardiotonic) Muqawwi-e-Bah (Aphrodisiac) Musaffi-e-Khoon (Blood purifier) Mudirr-e-Tams (Emmenagogue)
14.	Tabasheer	(Bambusa arundinacea),	Poaceae	Mubarrid (Coolant) Daafi-e-Humma (Antipyretic – reduces fever) Musakkin (Sedative) Muqawwi-e-A'sab (Nervine tonic) Muqawwi-e-Qalb (Cardiotonic)

15.	Anisoon	(Pimpenella anisum),	Apiaceae	Muqawwi-e-Meda (stomachic) Muqawwi-e-Jigar (hepatotonic) Muqil(expectorant) Daaf-e-Tafun (antiseptic) Muaddil (corrective)
16.	Badiyan	(Foeniculum vulgare),	Apiaceae	Mufatteh-e-Sudad (deobstruent) Muqawwi-e-Meda (stomachic) Daafi-e-Riyah (carminative) Mudir-e-Baul (diuretic)
17.	Tukhm-e-Karafs	(seeds- Apium graveolens),	Apiaceae	Mudir-e-Baul (diuretic) Musakkin (analgesic) Daafi-e-Riyah (carminative) Muqil (expectorant)
18.	Beekh Kasani	(Roots- Cichorium intybus),	Asteraceae	Muqawwi-e-Jigar (hepatotonic) Mufatteh-e-Sudad (deobstruent) Mudir-e-Baul (diuretic) Mushil (mild laxative)
19.	Beekh Izkhar	Roots- Andropogen schoenanthus),	Poaceae (Gramineae)	Mudir-e-Baul) – Diuretic Mubarrid – Refrigerant (cooling agent) Multaff – Demulcent Musakkin-e-Hiddat- Anti-inflammatory (reduces bodily heat/inflammation) Munaffis – Expectorant
20.	Sumbul-ut-Tib	Nardostachys jatamansi),	Caprifoliaceae	Muqawwi-e-A'sab (Nervine tonic) Muqawwi-e-Dimagh (Brain tonic) Musakkin (Sedative) Mufarreh (Exhilarant – mood enhancer) Muqawwi-e-Qalb (Cardiotonic)

Unani Formulations of Fatty Liver ²⁴

S.N.	Compound Formulation	Ingredients	Main Action
1.	Aab-murawaqain	Kasni, Barg-e-gul-e-neelofar, revand chini, Sana makki, Sharbat-e-Unnab	Mufatteh-e-sudad Munaffis-e-kabad Musaffi-e-Dam
2.	Sharbat deenar	Sana Makki, Turbud Safed, Rewand Chini, Post Halela, Aftimoon, Mako, Amaltas, Qand Safed	Mus'hil-i-Safra Munaqqi-i-Kabid Mulayyyian Mufttih Sudad
3.	Sharbat bazoori	Badyan, Kishneez, Tukhme Khashkhash, Tukhme Khurfa, Shahtara, Kasni	mudir-e-baul

4.	Qurs afsanteen	Afsanteen, Post Halela Zard, Sana Makki, Naushadar,	muqawwi-e-meda muqawwi-e-jigar
5.	Jawarish jalinoos	Amla, Zanjabeel, Dana heel Khurd, Darcheeni, Asaroon, Saqmonia, Qand Safaid	Muqawwi-e-Meda Hazim
6.	Majoon dabidulward	Sana Makki, Gul-e-surkh, Amla, Turbud Safaid, Post Halela, Asl-us-Soos,	Muqawwi-e-Jigar Mushil-e-Safra
7.	Dawa ul kurkum	Kurkum, Asl-us-Soos, Ustukhuddus, Zafran (Saffron), Turbud,	Muqawwi-e-Jigar Munaqqi-e-Kabid
8.	Sikanjabeen bazoori	Ushaq, Shahtara, Kasni, Badyan, Kishneez, Sirka, sugar	Muqawwi-e-Kabid Mudir-e-Baul
9.	Arq Kasni	Kasni	Muqawwi-e-Jigar Munaqqi-e-Dam Mudir-e-Baul
10.	Arq makoy	Mako	Mufattih-e-Sudad Musaffi-e-Dam Muqawwi-e-Jigar Mushil-e-Safra
11.	Arq brinjasif	Brinjasif	Muqawwi-e-Jigar Mufattih-e-Sudad Mushil-e-Safra Daf-e-Hiddat

CONCLUSION:

Fatty Liver Disease (FLD), a reversible condition caused by triglyceride accumulation in liver cells, is increasingly prevalent due to obesity, insulin resistance, and poor lifestyle habits. In Unani medicine, the liver is central to maintaining health through its vital powers and balanced temperament. Fatty liver aligns with conditions like Sue Mizaj Kabid and Saman-e-Mufrit, resulting from cold, moist derangements. Preventive Unani strategies include diet therapy (Ilaj-bil-Ghiza), regimental therapy (Ilaj-bit-Tadbeer), and herbal drugs (Ilaj-bid-Dawa) to restore humoral balance. This holistic approach emphasizes personalized lifestyle modifications and traditional remedies to manage and prevent liver dysfunction.

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