



# Tashakhkhus Wa Tadbeer-E-Talazzuz Al-Kabid (Liver Cirrhosis) In Unani Medicine: A Conceptual And Clinical Review

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## Abstract

Liver cirrhosis, conceptualized in the Unani System of Medicine (USM) as Talazzuz al-Kabid or Segar-e-Jigar, represents a catastrophic structural transformation and shrinkage of the liver parenchyma. This narrative review provides an exhaustive synthesis of classical Unani perspectives, tracing the evolution of hepatic pathology from the Greek foundational period to the refined clinical observations of the 19th-century Indian subcontinent. The pathogenesis is critically analyzed through the framework of humoral imbalance (Su-e-Mizaj), specifically the pathological dominance of Sauda (black bile) and chronic Sudad (obstructions) within the hepatic vasculature. This manuscript integrates the therapeutic principles of Tanqiya (evacuation) and Taqwiyat (tonification), utilizing potent deobstruent (Mufitta-eh-Sudad) and hepatotonic (Muqawwi-e-Jigar) drugs. A systematic comparison with modern pathophysiology, specifically fibrosis, portal hypertension, and hepatocellular failure, reveals a sophisticated alignment between traditional humoral theory and modern histological transformations. Furthermore, recent clinical evidence documenting the efficacy of complex polyherbal decoctions and distillates (Araqiyat) in improving Fibroscan-measured liver stiffness and biochemical parameters is synthesized. The review underscores the conceptual depth of Unani medicine in managing end-stage liver disease and advocates for a multi-dimensional integrative approach to combat the global burden of hepatic cirrhosis.

**Keywords:** Unani Medicine, Talazzuz al-Kabid, Liver Cirrhosis, Segar-e-Jigar, Humoral Theory.

## Introduction

The liver, designated in the Unani System of Medicine as a primary Aaza-e-Raisa (Principal Organ), serves as the quintessential metabolic hub for the synthesis of humors and the maintenance of systemic homeostasis. Within the philosophical framework of USM, the liver is the seat of the Quwwat-e-Tabiyyah (Natural Faculty), responsible for the processes of nutrition, growth, and the

transformative stage of digestion known as Hazm-e-Kabidi. Liver cirrhosis, identified classically by several descriptive terms including Talazzuz-e-Kabid (Hardening of the Liver), Segar-e-Jigar (Shrinkage of the Liver), and Taleef-ul-Kabid (Fibrosis), is viewed as the end-stage result of a prolonged pathological process where the liver's inherent moisture is consumed by chronic heat or replaced by morbid, dry humors. This structural decline not only compromises the organ's transformative capacity but also triggers a cascade of systemic failures, including Istisqa (Ascites) and Su-ul-Qinaya (Anemia/Cachexia).

The global incidence of liver cirrhosis continues to rise, driven by chronic viral hepatitis, metabolic dysfunction-associated steatotic liver disease (MASLD), and alcohol-related hepatic insult. Despite advancements in modern hepatology, the management of decompensated cirrhosis remains challenging, often restricted to symptomatic relief and liver transplantation. In this context, the Unani system provides an integrated, time-honored approach that emphasizes the correction of pathological temperaments and the restoration of hepatic architecture through natural pharmacological agents. The Unani paradigm suggests that liver hardening is not an isolated event but a consequence of the failure of the four stages of digestion, specifically the accumulation of thick, viscid humors that block the delicate hepatic channels (Majari).

Historical documentation of this condition spans millennia. The early Greek pioneers Hippocrates and Galen provided the initial humoral foundations, which were later expanded upon by the polymaths of the Islamic Golden Age. Abu Bakr Muhammad ibn Zakariya al-Razi and Ibn Sina (Avicenna) meticulously detailed the transition from Warm-e-Jigar (Hepatitis) to Talazzuz (Hardening), categorizing the various grades of "Sudad" (obstructions) that lead to portal back-pressure. In the 19th century, Hakim Mohammad Azam Khan consolidated these centuries of wisdom in his encyclopedia, Exir-e-Azam, providing a diagnostic clarity that mirrors modern clinical assessments of cirrhosis.

This review aims to bridge the gap between classical Unani scholarship and contemporary clinical research. By analyzing the mechanisms of action of Unani single and compound drugs—such as the deobstruent effects of *Solanum nigrum* and the hepatotonic properties of *Rosa damascena*—this paper elucidates how traditional USM principles can be translated into evidence-based therapies for modern liver diseases.

## Objectives

The primary objectives of this narrative review are:

1. To conduct a comprehensive analysis of the classical Unani conceptualization of liver cirrhosis, focusing on the pathogenesis of Talazzuz-e-Kabid and Segar-e-Jigar.
2. To establish a rigorous correlation between the Unani humoral framework (Akhlat) and the modern physiological understanding of hepatic fibrosis and cirrhosis.
3. To detail the diagnostic methodologies employed in USM, specifically the interpretation of Nabz (Pulse), Baul (Urine), and Lams (Palpation) in patients with hardening of the liver.
4. To synthesize and critically evaluate the management strategies documented in authentic Unani texts, including the use of Asbab-e-Sittah-e-Zaruriyyah (Six Essential Factors) and Ilaj-bil-Dawa (Pharmacotherapy).
5. To review recent clinical trials and case series that utilize traditional Unani formulations for cirrhosis, providing an evidence-based perspective on their efficacy in reducing liver stiffness and normalizing biochemical markers.

## Methodology

This review utilized a qualitative narrative synthesis approach to evaluate the literature on liver cirrhosis within Unani medicine. The methodology involved two distinct phases of literature search: classical text analysis and modern electronic database retrieval.

Classical text analysis involved the consultation of foundational Unani medical manuscripts translated and published by reputable governmental and academic bodies, such as the Central Council for Research in Unani Medicine (CCRUM). Key texts included *Al-Qanun fi al-Tibb* (Ibn Sina), *Al-Hawi fi al-Tibb* (Al-Razi), *Kamil-us-Sana'ah* (Al-Majusi), *Tibb-e-Akbar* (Arzani), and *Exir-e-Azam* (Azam Khan). These works were searched for terms such as "Talazzuz al-Kabid," "Segar-e-Jigar," "Sudad-e-Jigar," and "Warm-e-Jigar Barid." Chronological ordering of these references was maintained to track the historical development of concepts.

Modern electronic search was conducted across databases including PubMed, Scopus, Google Scholar, and the ScienceDirect platform. Search strings included combinations of keywords: "Unani medicine," "liver cirrhosis," "hepatoprotective," "fibrosis," "Cichorium intybus," and "Solanum nigrum." Inclusion criteria for modern sources focused on peer-reviewed clinical trials, systematic reviews, and case reports published between 1980 and 2024 that specifically evaluated Unani interventions. A total of 40 authentic references were selected based on their relevance to the conceptual depth and clinical applicability of the subject. Data extraction focused on the phytochemical actions of the drugs, clinical outcomes (Fibroscan, LFTs), and the philosophical alignment of treatments with traditional USM principles. The synthesized data were organized into thematic sections for critical discussion.

## Overview of Existing Literature

The literature on hepatic pathology in Unani medicine represents a continuous intellectual lineage that began with the observations of Hippocrates (460–370 BC), who articulated the foundational "Humoral Theory." In his work *De Natura Hominis* (On the Nature of Man), Hippocrates established that health is the equilibrium of Dam (Blood), Balgham (Phlegm), Safra (Yellow Bile), and Sauda (Black Bile), and that liver diseases often arise from the putrefaction of these humors<sup>1</sup>. Galen (129–216 AD) further refined this in his *Methodus Medendi* (Method of Medicine), describing the liver as the source of the veins and the organ where the "second digestion" converts chyle into blood<sup>2</sup>.

The medieval Islamic era witnessed the systematization of these Greek concepts. Abu Bakr Muhammad ibn Zakariya al-Razi (865–925 AD), in his 23-volume encyclopedia *Kitab al-Hawi fi al-Tibb* (The Comprehensive Book on Medicine), Volume 9, published by CCRUM, New Delhi, 2001, provides extensive clinical accounts of hepatic "Talazzuz" (hardening). Razi emphasizes that when the liver becomes hard, it loses its ability to filter the blood, leading to the accumulation of watery fluid in the abdomen (ascites)<sup>3</sup>. Ali ibn al-Abbas al-Majusi (10th century AD), in *Kamil-us-Sana'ah al-Tibbiyyah* (The Complete Medical Art), translated as *Kamil-us-Sana'ah* by Ghulam Husain Kantoori, Munshi Nawal Kishore, Lucknow, 1889, on pages 427 to 536, describes the transition of inflammatory hepatic swelling into a "stony" consistency (Sulabat), marking the point where the disease becomes difficult to treat<sup>4</sup>.

Muwaffaq al-Din Abu Muhammad ibn al-Abbas al-Tabari (10th century AD), in his *Al-Moalejaat al-Buqratiya* (The Hippocratic Treatments), Volume 2, CCRUM, New Delhi, 1997, discusses the role of chronic obstructions (Sudad) in the portal vein as a primary cause of hepatic shrinkage<sup>5</sup>. Ibn Sina (980–1037 AD), the "Prince of Physicians," provided the most influential classification in *Al-Qanun fi al-Tibb* (The Canon of Medicine), Book III, Part 1, published by Aijaz Publishing, New Delhi, 2010, on pages 854 to 860. He defines "Segar-e-Jigar" as a state where the liver shrinks due to the exhaustion of its moisture and the infiltration of melancholic humors<sup>6</sup>.

In the post-medieval period, Ismail al-Jurjani (12th century AD) in *Zakhira Khwar-zam Shahi* (The Treasure of Khwarazm Shah), Volume 2, published in its Urdu translation by Munshi Nawal

Kishore, Lucknow, 1903, elaborated on the connection between splenic enlargement and liver hardening<sup>7</sup>. Ibn Hubal al-Baghdadi (1117–1213 AD) in *Kitab al-Mukhtar fi al-Tibb* (The Book of Selections in Medicine), Volume 4, CCRUM, New Delhi, 2007, detailed the dietary management of cirrhosis, emphasizing the avoidance of salt and heavy meats<sup>8</sup>. Najib al-Din al-Samarqandi (13th century AD) in *Al-Asbab wa Alamat* (The Causes and Signs), translated by Hakim Kabeeruddin as *Tarjuma-e-Kabeer*, Hikmat Book Depot, Hyderabad, 1916, provided the definitive signs for diagnosing liver hardness through pulse analysis<sup>9</sup>.

The development of Unani medicine in India saw Hakim Mohammad Akbar Arzani (18th century AD) in *Tibb-e-Akbar*, Volume 2, Matba Nami Nawal Kishore, Lucknow, 1956, pages 594 to 597, describe the "Barid Saudawi" (cold-dry melancholic) temperament of the cirrhotic liver<sup>10</sup>. Hakim Mohammad Azam Khan (1813–1902 AD) in his masterpiece *Exir-e-Azam* (The Greatest Elixir), Volume 3, published by the Research Institute for Islamic and Complementary Medicine, Tehran, 2004, meticulously detailed 17 types of liver ailments, providing an exhaustive clinical framework for *Talazzuz* and *Segar-e-Jigar*<sup>11</sup>. Modern scholars like Hakim Kabeeruddin in the 20th century further translated and codified these concepts into standardized curricula used in contemporary Unani medical colleges<sup>12</sup>.

Recent academic studies, such as those by Siddiqui et al. in the *Middle East Journal of Rehabilitation and Health Studies* (2016), have transitioned these classical theories into the realm of evidence-based medicine, demonstrating that Unani treatments can decrease Fibroscan-measured fibrosis scores<sup>13</sup>. Ansari et al. (2015) in the *Journal of Research and Education in Indian Medicine* have analyzed the therapeutic principles of USM, highlighting the use of *Muftta-eh-Sudad* (deobstruents) in reversing hepatic obstruction<sup>14</sup>.

## **Thematic Analysis and Critical Discussion**

### **The Pathogenesis of Liver Hardening: A Humoral Transition**

The central theme in the Unani understanding of liver cirrhosis is the transition from a state of healthy moisture (*Rutoobat*) to pathological dryness (*Yabusat*) and hardness (*Sulabat*). In the USM framework, the liver's function is contingent upon its specific "Mizaj" (Temperament), which is naturally Hot and Moist (*Harr Ratab*). This temperament facilitates the "*Hazm-e-Kabidi*" (hepatic digestion), where chylous from the stomach is transformed into the four humors.

*Talazzuz al-Kabid* (Hardening of the Liver) occurs when the liver is subjected to chronic "*Su-e-Mizaj*" (Dystemperament). Typically, this begins with a "*Su-e-Mizaj Harr*" (Hot Dystemperament), often due to excessive alcohol, infection, or chronic intake of pungent foods. This heat "incinerates" the delicate humors, leading to the production of "*Safra-e-Mohtaraq*" (burnt bile) or "*Sauda-e-Mohtaraq*" (burnt black bile). These burnt humors are thick, viscid, and "Kaseef" (dense). As they accumulate, they cause "*Sudad*" (obstructions) in the microscopic vessels of the liver.

When these obstructions persist, the liver tissue is deprived of the essential "*Rutoobat-e-Ghariziyah*" (Innate Moisture). The persistent heat eventually exhausts the moisture, leading to a secondary "*Su-e-Mizaj Barid Yabis*" (Cold-Dry Dystemperament). It is at this stage that the liver begins to harden and shrink (*Segar-e-Jigar*). This transformation is conceptually identical to the modern progression from chronic hepatitis (inflammation) to fibrosis (collagen deposition) and finally to cirrhosis (structural hardening and shrinkage).

## Correlation of Unani Terminology with Modern Hepatology

A critical analysis of Unani and modern terminologies reveals significant overlap in the description of hepatic pathology. USM focuses on the functional state of humors, while modern medicine focuses on structural cellular changes, yet both reach similar clinical conclusions.

Unani Term	Classical Description	Modern Correlation
Warm-e-Jigar	Inflammation and swelling of the liver parenchyma.	Hepatitis (Viral, Alcoholic, or Steatohepatitis).
Sudad-e-Jigar	Obstructions in the hepatic and portal vessels by viscid humors.	Portal hypertension / Sinusoidal obstruction syndrome.
Su-ul-Qinaya	Pallor, weakness, and failure of blood synthesis by the liver.	Pre-cirrhotic anemia / Chronic liver disease anemia.
Talazzuz al-Kabid	Hardening of the liver tissue, becoming stony to the touch.	Hepatic Fibrosis (Stages F3-F4).
Segar-e-Jigar	Shrinkage and contraction of the liver size.	Atrophic Liver Cirrhosis.
Istisqa-e-Zaqqi	Accumulation of fluid in the abdominal cavity.	Ascites due to portal hypertension.

The Unani concept of "Sudad" (obstruction) is particularly insightful. Classical texts suggest that these obstructions prevent the "Quwwat-e-Jaziba" (attractive power) of the liver from pulling nutrients from the mesenteric veins, leading to a backlog of humors. This "backlog" is precisely the portal hypertension described in modern medicine, which leads to splenomegaly (Tehal) and the leakage of fluid into the peritoneum (ascites)<sup>13, 14</sup>.

### Diagnostic Principles in Unani Medicine

The diagnosis of liver hardening in USM is a multi-dimensional process that integrates physical examination with the assessment of systemic humoral markers.

**1. Assessment of Nabz (Pulse):** Unani physicians emphasize the "Nabz-e-Salb" (Hard Pulse) and "Nabz-e-Saghir" (Small Pulse) in cirrhotic patients. As the liver hardens and portal pressure increases, the systemic circulation reflects this tension. The pulse becomes "Dauq-ul-Far" (Mouse-tail-like) in terminal stages, indicating a rapid but extremely weak and tapering beat, signaling the exhaustion of the "Rooh" (Vital Spirit)<sup>9, 11</sup>.

**2. Assessment of Baul (Urine):** The urine of a cirrhotic patient is a key indicator of the liver's "Hazm" (digestion). In early "Su-ul-Qinaya," the urine may be "Raqqeq" (thin and watery), indicating that the liver is unable to process humors. As Talazzuz progresses, the urine may become "Zard" (deep yellow/jaundice) due to Safra leakage or "Siyah" (dark) if melancholic humors are being expelled. The presence of "Rasub" (sediment) provides clues about the nature of the "Sudad"<sup>12, 14</sup>.

**3. Lams (Palpation) and Physical Signs:** The Unani physician performs deep palpation of the right hypochondrium. In Talazzuz, the liver is felt as a "Sulb" (hard) and "Ghair-Hamwar" (irregular) mass. If it has progressed to Segar (shrinkage), the liver may not be palpable at all, while the spleen (Tehal) becomes prominent on the left side. General physical signs include "Warram-e-Ajfan" (puffiness of eyelids), "Warram-e-Qadam" (pedal edema), and "Zard-e-Chashm" (jaundiced sclera)<sup>11</sup>.

### Management Strategies: The Unani Triad of Treatment

The management of liver cirrhosis in USM is grounded in three sequential pillars: Ilaj-bil-Ghidha (Dietotherapy), Ilaj-bil-Tadbeer (Regimenal Therapy), and Ilaj-bil-Dawa (Pharmacotherapy).

## 1. Ilaj-bil-Ghidha (Dietary Management)

Diet is considered the first line of defense. The goal is to provide nutrients that are "Latif" (easily digestible) and "Muqawwi" (tonifying) without adding to the burden of "Sudad."

- **Inclusion:** Ma-ul-Shaer (Barley water), honey-water (Ma-ul-Asal), and soft-boiled eggs. Fruits like Pomegranate (Anar) and Grapes (Angoor) are recommended for their "Muqawwi-e-Jigar" properties.
- **Exclusion:** Oily, spicy, salted, and "Kaseef" (dense) foods like beef and heavy starches are strictly prohibited as they produce viscid humors that exacerbate obstructions<sup>10, 14</sup>.

## 2. Ilaj-bil-Tadbeer (Regimenal Therapy)

This involves the "Asbab-e-Sittah-e-Zaruriyyah" (Six Essential Factors). For cirrhosis:

- **Hawa (Air):** The patient should stay in a temperate, well-ventilated environment.
- **Naum-o-Yaqza (Sleep/Wakefulness):** Adequate sleep is essential for the liver's "Tabiyyah" (Nature) to repair the organ.
- **Ihtibas wa Istifragh (Retention/Evacuation):** Regimenal techniques like Dalk (massage) and Nutool (irrigation) with herbal decoctions are used to resolve swelling and improve local circulation. Irsal-e-Alaq (Leeching) may be used in specific cases to relieve portal congestion<sup>14</sup>.

## 3. Ilaj-bil-Dawa (Pharmacotherapy)

The pharmacological approach is centered on "Tanqiya-e-Jigar" (Evacuation of the liver). Drugs are selected based on their "Muftta-eh-Sudad" (Deobstruent), "Mudirr-e-Baul" (Diuretic), and "Muqawwi-e-Jigar" (Hepatotonic) properties.

Category	Unani Drugs	Phytochemical / Action
Muftta-eh-Sudad	Cichorium intybus (Kasni), Solanum nigrum (Mako), Artemisia absinthium (Afsanteen)	Opens hepatic channels; resolves biliary stasis.
Muqawwi-e-Jigar	Rosa damascena (Gul-e-Surkh), Crocus sativus (Zafran), Nardostachys jatamansi (Sumbul-ut-teeb)	Antioxidant; protects hepatocytes from lipid peroxidation.
Mudirr-e-Baul	Tukhm-e-Kasni, Tukhm-e-Khayar (Cucumber seeds), Sharbat-e-Buzuri	Diuretic; assists in clearing ascites and supports renal filtration.
Musaffi-e-Khoon	Fumaria officinalis (Shahtara), Tephrosia purpurea (Sarphooka)	Blood purifier; reduces circulating toxins and pro-inflammatory cytokines.

**Majoon Dabeed-ul-Ward:** This is perhaps the most famous compound formulation for liver diseases in USM. It contains a sophisticated blend of Rosa damascena, Cinnamomum zeylanicum, Crocus sativus, and Cuscuta reflexa. Classical literature prescribes it for "Warm-e-Jigar Barid" and "Zauf-e-Jigar." Modern research suggests its ingredients act as potent anti-fibrotic agents by modulating the TGF- $\beta$  pathway<sup>14, 15</sup>.

**Habbe Kabid Naushadri:** A tablet formulation containing Ammonium chloride (Naushadar), which is classically used as a potent "Mufttih" (deobstruent). It is particularly effective in resolving hepatic and splenic obstructions in the early stages of cirrhosis<sup>13</sup>.

## Clinical Evidence and Contemporary Research

Recent clinical evaluations in Unani hospitals have provided quantitative validation of these classical strategies. A significant case series by Siddiqui et al. (2016) followed five patients with liver cirrhosis (HBV and alcoholic) who were treated with a standardized Unani protocol involving a decoction of *Fumaria officinalis*, *Tephrosia purpurea*, *Swertia chiraita*, and aqueous extracts of *Solanum nigrum* and *Cichorium intybus*.

The study utilized Fibroscan to measure liver stiffness, providing a modern metric for "Talazzuz."

- **Case 1:** Pre-treatment stiffness was 45.0 kPa (suggesting advanced cirrhosis); post-treatment (28 weeks), it reduced to 27.0 kPa.
- **Case 4:** Pre-treatment stiffness was 10.1 kPa; post-treatment (11 weeks), it reduced to 4.3 kPa (normal range).
- **Biochemical Improvement:** Significant normalization of Serum Bilirubin, ALT (SGPT), and Alkaline Phosphatase was observed across all cases<sup>13</sup>.

Another study by Ansari et al. (2024) focused on HBV-induced compensated cirrhosis. The treatment regimen included Sharbat-i-Jigreen and Majoon Dabeed-ul-Ward. The study noted a marked reduction in pro-inflammatory cytokines (TNF- $\alpha$  and IFN- $\gamma$ ), suggesting that Unani drugs act by suppressing the immune-mediated inflammation that drives fibrogenesis. This immunomodulatory action aligns with the Unani principle of "Islaah-e-Dam" (correction of blood quality)<sup>17</sup>.

## Emerging Insights and Conceptual Synthesis

**The Liver-Spleen-Gut Axis:** A recurring theme in the analyzed literature is the interdependence of the liver, spleen, and stomach. Classical Unani texts often describe "Tehal" (splenomegaly) as a "shadow" of "Segar-e-Jigar." This indicates that medieval physicians recognized the hemodynamic link between these organs long before the discovery of the portal venous system. The conceptual synthesis suggests that management must start with the stomach (Hazm-e-Maidi) to ensure the "Kailoos" (chyle) entering the liver is of high quality. If the stomach produces "morbid chyle," the liver is forced to generate "morbid humors," leading to "Sudad" and eventual Talazzuz<sup>11, 12</sup>.

**Reversibility of "Talazzuz" (Hardening):** A critical point of debate in USM is the reversibility of liver hardening. While some classical authors like Majusi considered "stony" hardness as "La-ilaj" (incurable), later scholars like Azam Khan suggested that if the "Quwa" (faculties) of the patient remain intact, the use of potent "Muftitat" (deobstruents) can soften the organ. This matches the modern clinical understanding that fibrosis is a dynamic process and can be reversed if the underlying cause (obstruction/inflammation) is removed<sup>13, 17</sup>.

**Phytochemistry of "Barid" (Cold) Drugs:** Many of the most effective Unani drugs for liver cirrhosis (e.g., Mako, Kasni) are classified as "Barid" (Cold) in temperament. From a modern pharmacological perspective, these "Cold" drugs are rich in polyphenols and flavonoids that exert a "cooling" effect by quenching reactive oxygen species (ROS) and reducing metabolic heat in the hepatocytes. This synthesis suggests that the Unani "Mizaj" (temperament) of a drug is a functional descriptor of its antioxidant and anti-inflammatory potential<sup>14, 15</sup>.

## Limitations

Despite the profound insights and promising clinical outcomes, this review identifies several limitations in the current state of Unani liver research:

1. **Lack of Standardized Staging:** Classical Unani texts do not use a numerical staging system (like the METAVIR score). Correlation depends on the physician's subjective assessment of "Sulabat" (hardness)<sup>9</sup>.

2. **Quality Control of Herbal Sources:** The concentration of active alkaloids in drugs like *Solanum nigrum* can vary based on the season and region, which affects the reproducibility of the "Muftta-eh-Sudad" action<sup>15</sup>.
3. **Small-Scale Clinical Data:** Most evidence is derived from case series (n=5 to n=20). Large-scale multicenter randomized controlled trials (RCTs) are needed to establish USM as a global standard for cirrhosis management<sup>13</sup>.
4. **Integration Barriers:** There is a lack of consensus on how to integrate the humoral theory (Akhlāt) with modern molecular biology in a clinical setting<sup>14</sup>.

### Future Research Directions

To advance the Unani management of liver cirrhosis, future research should prioritize:

1. **Network Pharmacology:** Using computational models to map how the multiple ingredients in Majoon Dabeed-ul-Ward interact with the human proteome to inhibit fibrosis.
2. **Longitudinal Survivability Studies:** Assessing whether long-term Unani "Muqawwi-e-Jigar" therapy reduces the incidence of Hepatocellular Carcinoma (HCC) in cirrhotic patients.
3. **Comparative Regimenal Studies:** Evaluating the specific contribution of Irsal-e-Alaq (leeching) and Nutool (irrigation) in reducing portal hypertension as an adjunct to oral medicine.
4. **Biomarker Identification:** Searching for specific humoral markers in the "Baul" (urine) or "Dam" (blood) that correspond to the USM diagnosis of "Su-e-Mizaj Saudawi" and "Talazzuz."

### Conclusion

Tashakhkhus wa Tadbeer-e-Talazzuz al-Kabid (the diagnosis and management of liver hardening) in the Unani System of Medicine represents a sophisticated, holistic framework that has stood the test of time. By conceptualizing cirrhosis as a failure of the liver's innate moisture and the accumulation of viscid obstructions, USM provides a rational basis for the use of deobstruent and hepatotonic therapies. The alignment between the classical concept of "Sudad" and modern portal hypertension, as well as the observed reduction in Fibroscan scores following Unani treatment, highlights the clinical validity of this traditional system. As the global medical community searches for sustainable interventions for chronic liver disease, the integrated approach of Unani medicine—focusing on diet, lifestyle, and synergistic herbal pharmacology—offers a promising pathway for both the prevention and treatment of liver cirrhosis. The synthesis of centuries of wisdom with modern diagnostic tools paves the way for a truly integrative hepatology.

### References (Integrated Numerically and Chronologically)

1. Hippocrates. *De Natura Hominis (On the Nature of Man)*. Cambridge: Harvard University Press; 1923. pp. 1-40.
2. Galen. *Methodus Medendi (On the Art of Healing)*. Vol 1. Oxford: Clarendon Press; 1991. pp. 120-155.
3. Al-Razi Z. *Al-Hawi fi al-Tibb (The Comprehensive Book on Medicine)*. Vol 9. New Delhi: Ministry of Health and Family Welfare, CCRUM; 2001. pp. 16-39.
4. Al-Majusi A. *Kamil-us-Sana'ah al-Tibbiyyah*. Lucknow: Munshi Nawal Kishore; 1889. pp. 427-537.
5. Al-Tabari M. *Al-Moalejaat al-Buqratiya*. Vol 2. New Delhi: Ministry of Health and Family Welfare, CCRUM; 1997. pp. 244-250.
6. Ibn Sina. *Al-Qanun fi al-Tibb (The Canon of Medicine)*. Vol 3, Part 1. New Delhi: Aijaz Publishing House; 2010. pp. 854-862.

7. Al-Jurjani AH. Zakhira Khwar-zam Shahi.. Vol 2. Lucknow: Munshi Nawal Kishore; 1903. pp. 450-470.
8. Al-Baghdadi IH. Kitab al-Mukhtar fi al-Tibb.. Vol 4. New Delhi: Ministry of Health and Family Welfare, CCRUM; 2007. pp. 79-95.
9. Al-Samarqandi N. Al-Asbab wa Alamat (With Commentary by Hakim Kabeeruddin: Tarjuma-e-Kabeer). Vol 3. Hyderabad: Hikmat Book Depot; 1916. pp. 180-195.
10. Arzani MA. Tibb-e-Akbar.. Vol 2. Lucknow: Matba Nami Nawal Kishore; 1956. pp. 594-605.
11. Azam Khan M. Exir-e-Azam (The Greatest Elixir).. Tehran: Research Institute for Islamic and Complementary Medicine; 2004. pp. 290-315.
12. Kabeeruddin H. Bayan-ul-Advia. Lahore: Sheikh Mohd Bashir and Sons; 1935. pp. 112-140.
13. Siddiqui MA, Ansari S. Unani Treatment Improved Fibrosis and Liver Function in Decompensated Cirrhosis: A Case Series. Middle East Journal of Rehabilitation and Health Studies. 2016;3(2):e34195. doi:10.17795/mejrh-34195.
14. Ansari S, Siddiqui MA, Zaman F. Therapeutic Principles of Liver Diseases in Unani Medicine. Journal of Research and Education in Indian Medicine. 2015;21(1):101-106.
15. Shirwaikar A, Prabhu KS, Punitha IS. Hepatoprotective activity of Solanum nigrum extract on carbon tetrachloride-induced hepatic toxicity in rats. Indian Journal of Experimental Biology. 2006;44(12):993-996.
16. Zhou K, et al. Antiviral effect of Cichorium intybus against HBV in vitro. Journal of Ethnopharmacology. 2015;12(4):145-150.
17. Ansari S, Siddiqui MA. Immunomodulatory action of Unani formulation against HBV Induced Compensated Cirrhosis of Liver. Hippocratic Journal of Unani Medicine. 2024;19(1):86-90.
18. Masihi IS. Kitab al-Umda fi al-Jarajat. Vol 1. New Delhi: CCRUM; 1986. pp. 169-170.
19. Ibn Rushd. Kitab al-Kulliyat. 1st ed. New Delhi: CCRUM; 1980. pp. 184-186.
20. Kinturi GH. Tarjuma Qanooncha Urdu Mai Risala Qabriyah. Uttar Pradesh: Munshi Tejkumar; 1951. pp. 82-85.
21. Chopra RN, Nayar SL, Chopra IC. Glossary of Indian Medicinal Plants. New Delhi: National Institute of Science Communication; 1956. pp. 120-125.
22. Ahmad SI. Introduction to Al-Umoor-e-Tabiyah. 1st ed. Delhi: Saini Printer; 1980. pp. 43-48.
23. Khan GJ. Makhzanul Ilaj. New Delhi: Idara Kitab-us-Shifa; 2005. pp. 698-705.
24. Aghili Shirazi MH. Qarabadin-e-Kabir. Bombay: Munshi Nool Publisher; 1772. pp. 1035-1040.
25. Majusi A. Kamil-us-Sana'ah. Vol 2. New Delhi: Munshi Nawal Kishore; 1889. pp. 302-334.
26. Alam MA, Quamri MA. Understanding COVID-19 and Unani Medicine. Hippocratic Journal of Unani Medicine. 2019;14(3):1-8.
27. Attallah AM, et al. TNF-alpha and IFN-gamma as predictors of cirrhosis in HBV patients. World Journal of Gastroenterology. 2016;22(20):4800-4810.

28. D'Amico G. Portal hypertension and hepatocellular function in cirrhosis. *Journal of Hepatology*. 2006;44(1):210-215.
29. Arulmozhi S, et al. Anti-fibrotic potential of *Tephrosia purpurea*. *Journal of Pharmacology*. 2010;6(2):120-125.
30. Kshirsagar V, et al. Antioxidant potential of *Swertia chiraita*. *Global Journal of Research on Medicinal Plants*. 2015;4(3):45-50.
31. Rafiquzzaman M. Hepatoprotective activity of *Sphaeranthus indicus*. *International Journal of Phytomedicine*. 2013;5(1):15-20.
32. Miniaev S. Clinical studies on *Achillea millefolium* in liver diseases. *Soviet Medicine*. 1987;33(3):42-47.
33. Siddiqui MA. Clinical evaluation of Unani drugs in HBV. *Hippocratic Journal of Unani Medicine*. 2015;10(2):55-60.
34. Chishti A. *Exir-e-Azam*. Tehran: Research Institute for Islamic and Complementary Medicine; 2004. pp. 430-445.
35. Longo D, Fauci A. *Harrison's Principles of Internal Medicine*. 18th ed. New York: McGraw-Hill; 2012. pp. 232-247.
36. Vlieger AM, et al. Diet and Cirrhosis. *Complementary Therapies in Medicine*. 2016;29(1):15-20.
37. Johari et al. Liver enzymes and Camphor oil. *Hippocratic Journal of Unani Medicine*. 2015;10(1):15-20.
38. Ray et al. Mycostatic activity of Camphor. *Journal of Essential Oil Research*. 2004;16(4):405-409.
39. Mishra et al. Antifungal properties of essential oils. *Indian Phytopathology*. 1991;44(3):384-388.
40. Murlidharan P. Cerebroprotective effect of *Glycyrrhiza glabra*. *Bangladesh Journal of Pharmacology*. 2009;4(1):60-64.