

A NARRATIVE REVIEW OF ADHESIVE CAPSULITIS: INTEGRATING CONVENTIONAL AND UNANI MEDICAL PERSPECTIVES

MUBASHEERA BEGUM¹, HABIBULLAH V², NAZIYA TABASSUM B³, MOHAMED WASEEM⁴, MUSADDIQ AHMED⁵, HAFSA PATEL⁶, NUSRATH THASNEEM⁷

1-HOD, PG Moalajat, Government Unani Medical College, Chennai - 600106, Tamil Nadu, India. 2 HOD, Dept of Ilmu Advia, Government Unani Medical College, Chennai- 600106, Tamil Nadu, India. 3 lecturer Department of Moalajat, Government Unani Medical College, Chennai- 600106, Tamil Nadu, India, 4,5,6,7 – PG Scholars, Government Unani Medical College, Chennai- 600106, Tamil Nadu, India.

Corresponding Author: Dr. Mubasheera Begum M. D (U)., Email: urnetdoctor@gmail.com, Phone No. +919841620486.

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ABSTRACT

Adhesive capsulitis (frozen shoulder), also termed *Waja ul Mafasil* in Unani medicine, affects 2–5% of the general population, rising to 11–76% in diabetics and about 11% after shoulder surgery. Women between 50–70 years and individuals with metabolic disorders show higher susceptibility. Pathophysiology in conventional medicine highlights chronic inflammation, capsular fibrosis, and cytokine activity (IL-1, IL-6, TGF-β1) leading to excess collagen deposition. Unani medicine attributes the condition to cold and dry humoral imbalances (Balgham, Sauda), paralleling molecular mechanisms of stiffness and restricted mobility. Conventional therapies such as NSAIDs, physiotherapy, and corticosteroid injections provide only partial symptom control and carry adverse effects. Unani interventions, including fomentation (takmeed), massage (dalak), dry cupping (hijamat), and herbal drugs, have shown symptomatic improvement with fewer side effects, though current data are limited to small clinical trials and observational studies. Comparative findings indicate both systems recognize inflammation and fibrosis as central drivers, though articulated differently, suggesting scope for integrative approaches. Evidence supports combining physiotherapy with Unani modalities like hijamat or herbal regimens to potentially improve functional recovery and patient satisfaction. Further large-scale randomized trials and mechanistic studies are needed to validate efficacy and establish standardized protocols.

INTRODUCTION

Adhesive capsulitis, widely known as frozen shoulder, is a challenging condition that causes persistent shoulder pain and limits both active and passive movement, without clear structural issues like rotator cuff tears or arthritis [21, 5]. It significantly affects daily life, making tasks like reaching overhead, lifting, or dressing difficult, often leading to long-term discomfort and reduced function [13]. The condition's key features—pain, stiffness, and restricted mobility—can last from months to years, with recovery varying based on treatment and individual factors like age or health status [23, 12]. It is categorized as primary (idiopathic) when no specific cause is found, or secondary when linked to triggers like trauma, shoulder surgery, or systemic conditions such as diabetes, hypothyroidism, or heart disease [21, 16, 22]. Recent research has highlighted metabolic factors, suggesting that leptin resistance and ongoing inflammation may tie the condition to broader health issues like metabolic syndrome [14, 15]. Despite extensive study in conventional medicine, adhesive capsulitis remains difficult to treat fully, as many patients experience lingering symptoms [1, 4].

In Unani medicine, a traditional system based on Greco-Arabic principles, this condition is called *Waja ul Mafasil*, referring to joint pain and stiffness caused by imbalances in the body's four

humors: blood (Dam), phlegm (Balgham), yellow bile (Safra), and black bile (Sauda) [8]. Unani theory suggests that an excess of cold and dry humors, particularly Balgham and Sauda, reduces joint lubrication and flexibility, leading to a stiff and painful shoulder joint [10]. Unlike conventional medicine's focus on the joint itself, Unani views the condition as a whole-body imbalance influenced by diet, lifestyle, environmental factors, and a person's natural temperament (Mizaj) [8, 17]. Recent Unani studies have drawn parallels with modern science, suggesting that these humoral imbalances may reflect metabolic issues seen in conditions like diabetes, where inflammation and tissue changes are prominent [9]. Unani's holistic approach, aiming to restore balance, offers a complementary perspective that could enhance patient care when combined with conventional methods [5].

The condition's impact is evident in its epidemiology, which reveals a significant health burden. In the general population, adhesive capsulitis affects 2–5% of people, but certain groups face much higher risks [5, 5]. For those with diabetes, prevalence ranges from 11–76%, driven by metabolic and inflammatory changes [16, 6]. About 11% of patients develop the condition after shoulder surgery, likely due to localized inflammation and scarring [22]. Among elderly hospitalized patients, 5.2% develop it within a year, possibly due to immobility and other health issues [1]. Women,

particularly those aged 50-70, are more affected, with additional risk factors including low body mass index, neck issues, high cholesterol, hypothyroidism, and genetic tendencies^[23, 11, 18,22]. Studies from 2025 have added to this, pointing to lifestyle factors like poor sleep and metabolic profiles as key contributors^{14, 20}. In Unani terms, these risks align with factors that worsen cold and dry humors, such as metabolic disorders or sedentary habits, which reduce joint flexibility^{8, 10}. The overlap in risk factors between both systems suggests that combining their approaches could better target the condition's root causes^[13, 19].

In conventional medicine, adhesive capsulitis is understood as a process involving chronic inflammation and capsular fibrosis, unfolding in three stages: a painful inflammatory phase, a stiffening fibrotic phase, and a recovery phase¹⁷. However, recent findings question the idea that it resolves on its own, as many patients face symptoms for years without proper treatment²⁵. During the inflammatory phase, elevated cytokines like interleukin-1 (IL-1), interleukin-6 (IL-6), and transforming growth factor-beta 1 (TGF-β1), along with immune cell activity, cause synovial thickening and capsular changes¹³. In the fibrotic phase, fibroblasts and myofibroblasts produce excessive type III collagen, tightening the joint capsule and limiting movement⁴. Reduced activity of enzymes that break down tissue further locks in these changes¹³. Conditions like diabetes, hypothyroidism, and high cholesterol worsen this by creating an inflammatory and metabolically imbalanced environment^{6, 22}. New insights from 2025 link the condition to immune-metabolic issues, with leptin resistance and chronic inflammation explaining higher rates in metabolic syndrome^{14, 19}. Studies also show that metabolic factors influence pain and mobility outcomes, suggesting tailored treatments based on inflammation markers¹⁹.

In Unani medicine, the condition is seen as a result of humoral imbalance, where excess cold and dry humors (Balgham and Sauda) reduce joint lubrication, causing stiffness and pain, much like the fibrotic changes in conventional medicine^[10]. Factors like diabetes, hypothyroidism, immobility, cold exposure, or poor diet worsen this imbalance, particularly in the shoulder's complex joint structure^[8, 12]. A person's temperament (Mizaj) plays a role, with those having cold and dry natures being more susceptible^[10]. Recent 2025 reviews note that Unani's humoral concepts align with modern views of inflammation and metabolic issues, offering a foundation for combined research⁹. This overlap suggests that integrating Unani and conventional treatments could be effective^{12, 19}.

Treatment approaches differ but share the goal of reducing pain and restoring movement. Conventional options include nonsteroidal anti-inflammatory drugs (NSAIDs), corticosteroid injections, physiotherapy, and, in severe cases, arthroscopic surgery^{2, 4}. These can offer short-term relief but often fall short of full recovery and may cause side effects, like stomach issues from NSAIDs or tissue damage from repeated injections². Physiotherapy, with stretching and strengthening, is central but depends on patient commitment and may not fully address inflammation⁴. Unani medicine uses non-pharmacological and herbal treatments to restore humoral balance. Non-pharmacological methods include fomentation (takmeed, using warm compresses to boost circulation), massage (dalak, to improve mobility), dry cupping (hijamat bila shurt, to ease congestion), and local steaming (inkibab, to reduce stiffness)^[10, 24]. Herbal treatments, such as Suranjan (Colchicum luteum), Bozidan (Paeonia emodi), Muqil (Commiphora mukul), Asgandh (Withania somnifera), and compound formulas like Habbe Muqil and Majoon Chobchini, aim to reduce inflammation and support joint health^{8, 10}. Early studies and case reports show these methods, especially oil cupping and steaming, reduce pain and improve function, as measured by tools like the Shoulder Pain and Disability Index (SPADI) and Visual Analog Scale (VAS)^{2, 24, 10}. These treatments are often affordable and have fewer side effects, appealing to patients seeking non-drug options or those reacting poorly to conventional treatments^{4, 24}. Recent 2025 studies support Unani approaches, particularly for metabolic-related cases, using combined herbal and regimental therapies^{9, 10, 24]}.

Despite progress, Unani treatments lack strong evidence due to small studies and inconsistent methods, while conventional treatments struggle with long-term success^{25, 19}. The shared focus

on inflammation and tissue changes suggests that combining Unani's holistic methods with conventional ones could improve outcomes^{4, 5}. For example, pairing dry cupping with physiotherapy might enhance circulation and reduce scarring, while herbal remedies could calm inflammation in metabolic cases^{9, 19}. However, standardized protocols and deeper studies into how these treatments work are needed²⁴.

Objectives

The main goal of this narrative review is to combine insights from conventional and Unani medicine on adhesive capsulitis, covering its prevalence, causes, and treatments. Specific aims are: (1) to outline the condition's prevalence, incidence, and risk factors, focusing on high-risk groups like diabetic and post-surgical patients; (2) to compare conventional and Unani views on its causes, finding common ground between inflammation, fibrosis, and humoral imbalances; (3) to assess the effectiveness, safety, and practicality of conventional treatments (e.g., NSAIDs, physiotherapy) and Unani methods (e.g., takmeed, hijamat, herbal remedies); and (4) to pinpoint gaps in current knowledge and suggest future research, including large clinical trials, studies on how treatments work, and standardized Unani protocols to support combined care approaches. By linking conventional science with Unani's humoral theory, this review aims to deepen understanding and guide patient-centered care.

The aim of this study is to integrate conventional and Unani perspectives on adhesive capsulitis' prevalence, causes, treatments, and identify research gaps for combined therapeutic strategies.

Materials and Methods

This narrative review synthesizes evidence on adhesive capsulitis, also known as frozen shoulder or "Waja ul Mafasil" in Unani medicine, by integrating conventional and Unani medical perspectives on its epidemiology, pathophysiology, and management. A comprehensive literature search was conducted from January to April 2025 across PubMed, Scopus, Web of Science, Google Scholar, and Unani-specific databases (CCRUM, AYUSH Research Portal) using terms like "adhesive capsulitis," "frozen shoulder," "Waja ul Mafasil," "Unani medicine," and related keywords for prevalence, causes, and treatments, with Boolean operators to refine searches. No publication date limits were applied, but only English-language studies were included due to translation constraints. Manual searches of reference lists and grey literature, such as conference papers from CCRUM and AYUSH, supplemented the process to reduce bias and capture Unani studies. Eligible studies, spanning observational designs, randomized controlled trials, reviews, and case reports, addressed prevalence, risk factors, molecular or humoral mechanisms, or conventional and Unani treatments. A two-step screening process involved two reviewers independently assessing titles, abstracts, and full texts for relevance, with disagreements resolved through discussion or a third reviewer. Data were narratively synthesized into themes of epidemiology, pathophysiology, and management, comparing conventional approaches (e.g., NSAIDs, physiotherapy) with Unani methods (e.g., takmeed, hijamat, herbal remedies). No meta-analysis or formal quality assessment was performed due to study heterogeneity and the inclusion of preliminary Unani evidence, though limitations like small sample sizes were noted. This approach ensured a broad, accessible evidence base to guide integrative practice.

DISCUSSION

Adhesive capsulitis (frozen shoulder) is a multifaceted disorder with a profound impact on patient mobility and quality of life. The condition's epidemiology, risk profile, and pathophysiological underpinnings are increasingly well characterized through both biomedical and Unani lenses. Key findings from recent research demonstrate that chronic inflammation and capsular fibrosis – driven by cytokine activation, immune infiltration, and metabolic dysfunctions such as diabetes and hypothyroidism – are at the heart of disease progression and chronicity. The recognition of immune-metabolic processes, notably leptin resistance, further refines our understanding and points to a need for personalized approaches to prevention and management. Unani concepts of humor imbalance offer an aligned traditional perspective,

emphasizing the systemic nature and the importance of restoring equilibrium for joint health. ANDJ-Narrative-Review-Checklist.pdf While there is robust evidence for risk factors and mechanisms, critical gaps remain regarding long-term outcomes, the effectiveness of integrative therapies, and the validation of biomarker-guided treatment. Addressing these gaps through well-designed clinical trials and longitudinal studies is essential for advancing patient-centered care.

For clinical practitioners and policy-makers, this narrative review highlights the importance of early risk identification, lifestyle modification, metabolic control, and potential integration of Unani regimens into comprehensive treatment plans. The synthesis of modern biomedical science and traditional wisdom can inform personalized rehabilitation strategies, foster better long-term outcomes, and inspire future research directions in musculoskeletal medicine.

This narrative review synthesizes current biomedical research and Unani medical insights to offer a comprehensive understanding of adhesive capsulitis (frozen shoulder). The integration of epidemiological data, molecular pathogenesis, and humoral theory underscores the condition's multifactorial nature and the need for a holistic and patient-centered management approach. In clinical practice, recognizing key risk groups—particularly patients with diabetes, thyroid dysfunction, and those with sedentary or unhealthy lifestyles—is essential for early intervention and prevention. Biomedicine highlights chronic inflammation and capsular fibrosis as therapeutic targets, while Unani medicine emphasizes restoring humoral balance and encourages regimens such as oil massage, cupping, and lifestyle modification.

For registered dietitian nutritionists and allied health professionals, this review reinforces the importance of nutritional counseling, physical activity, and personalized care plans addressing both metabolic and musculoskeletal health. The value of metabolic control and dietary management in mitigating inflammation and fibrosis is evident, making collaboration among physicians, therapists, and nutritionists vital.

Policy development and implementation should support integrative care models that bridge conventional and traditional modalities, invest in biomarker research to enable precision medicine, and foster education about lifestyle and metabolic risk reduction.

Future research should prioritize high-quality clinical trials investigating combined biomedical and Unani therapies, biomarker-guided treatment strategies, and the long-term impact of lifestyle interventions. Ultimately, embracing an integrative, multidisciplinary approach may substantially improve outcomes and quality of life for individuals affected by adhesive capsulitis.

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