

## Overview of Ankylosing Spondylitis and its Management through Unani Medicine

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### Abstract

Ankylosing spondylitis (AS) is a systemic autoimmune disease primarily affecting the axial skeleton, leading to inflammation, stiffness, and chronic pain in the spine, neck, hips, and occasionally peripheral joints. Without adequate intervention, AS can severely impair mobility and quality of life due to progressive spinal fusion and deformity. Conventional management involves pharmacological interventions such as non-steroidal anti-inflammatory drugs (NSAIDs), disease-modifying antirheumatic drugs and biologics to reduce inflammation and prevent progression. However, alternative systems like Unani medicine offer valuable insights and adjunctive therapies that align with AS management goals. In Unani medicine, AS is referred to as *tahajjur-e-mafasil*, under the broader category of *waja-ul-mafasil* (joint disorders), which includes symptoms like joint pain, stiffness (*salabat*), and limited movement. This study examines the efficacy of both conventional and Unani therapeutic approaches for AS

management.

To evaluate Ankylosing spondylitis management strategies by integrating conventional treatments with Unani therapeutic practices, aiming to improve clinical outcomes and enhance the quality of life for AS patients.

This study involved a systematic review of AS and Unani literature and management on Ankylosing spondylitis. Key sources included studies on conventional AS treatments, such as *Ilaj-bit-Tadbeer* (regimental therapies) and herbal pharmacotherapy used to address symptoms of *tahajjur-e-mafasil*. A comparative analysis of therapeutic efficacy was conducted to identify complementary approaches.

A combined approach utilizing both conventional Unani therapeutic modalities shows potential in the management of ankylosing spondylitis. Integrating Unani *Ilaj-bit-Tadbeer* therapies with conventional treatment can offer symptomatic relief, decrease inflammation, and improve mobility, ultimately enhancing patient qu-

ality of life. Further research and clinical studies are recommended to substantiate these findings and explore integrative treatment protocols for optimal AS management.

### Keywords

Ankylosing Spondylitis, Unani Medicine, *Tahajjur-e-mafasil*, *Waja-ul-mafasil*, *Ilaj-bit-Tadbeer*.

## 1. INTRODUCTION

Ankylosing spondylitis is a type of chronic arthritis with inflammation that mostly affects the joints, ligaments, and tendons of the spine. The Greek word for “vertebra” is where the prefixes “spondyl” and “spondylo” come from. “Spondylitis” is an inflammation of the vertebrae in the spine. since the prefix “itis” at the end denotes inflammation. “Spondylitis” refers to inflammation of the spinal vertebrae because the word “itis” ends in “itis,” which signifies inflammation. According to the definition of the word “ankylosing,” which means “fusing,” it denotes inflammation-related loss of flexibility in the neck and back. A group of conditions known as spondyloarthritis (SPA) include ankylosing spondylitis (AS). The terms “spondyloarthritis” and “spondylitis” are interchangeable. Back and neck pain, as well as occasionally the hips and heels, are all symptoms of ankylosing spondylitis (AS), a chronic inflammatory condition. The vertebral column, which makes up the back and neck, is made up of separate bones.

A seronegative spondyloarthropathy known as ankylosing spondylitis results in fusion (ankylosis) of the spine, sacroiliac (SI) joints, as well as large and small joints. Additionally, other less common names for it include Marie Strümpell illness and Bechterew sickness. When a disease

is first developing, mobility of the spine could be normal (MA Brown *et al.*, 2010 ; P. Ravisankar *et al.*, 2015 ; JD Reveille ., 2015).

Since ancient Egypt, people have been affected with ankylosing spondylitis (AS) (Feldtkeller E *et al.*, 2003 ; Ryall N *et al.*, 1998). The original description of AS was developed in the 1800s. Further knowledge of the illness, particularly its genetic basis, was established throughout the 1900s. The condition is acknowledged as a member of the family of rheumatic disorders known as spondyloarthropathy. These include reactive arthritis, inflammatory bowel disease-related arthritis, and psoriatic arthritis (Ryall N *et al.*, 1998). Both of these disorders have a connection to HLA-B27 and similar clinical characteristics.

## 2. MATERIALS AND METHODS

### 2.1. Epidemiology

The disease begins to manifest at its worst in the second and third decades, with an approximately 3:1 male-to-female ratio in most cultures, the overall prevalence is under 0.5%, but among the Pima and Haida Indians, who have a high incidence of HLA-B27, it is significantly higher. Unambiguous evidence has not been found for infectious triggers. Contrary to expectations, chronic prostatitis is increasingly frequent yet doesn't seem contagious. Patients with established ankylosing spondylitis had increased fecal klebsiella aerogenes carriage, which may be related to the worsening of both joint and eye illness (Davidson's principles and practice of medicine 22nd Edition).

### 2.2. Pathophysiology

A Class 1 surface antigen called HLA-B27, which is present in 89% of AS patients (Taurog JD *et al.*, 2016), is closely linked to the

spondyloarthropathy family of illnesses. HLA-B27 binds antigenic peptides so they can be presented to cytotoxic T cells, allowing the immune system to respond normally and attack infections like the influenza virus (McMichael A. *et al.*, 2002). HLA-B27's precise mechanism of action in AS is as of yet unknown. However, it is believed to entail aberrations in antigen-presenting cells, which then set off the inflammatory cascade (Taurog JD *et al.*, 2016).

The enzyme ERAP1 and its potential connection to the pathophysiology of AS have attracted attention (Keidel S *et al.*, 2013). Trimming peptides to prepare them for binding to HLA Class I molecules is the role of the enzyme. It has immunological receptors. To find out if ERAP1 could serve as a therapeutic target, more study is being done in this area of AS.

Regardless of the underlying circumstances, AS causes structural harm to the axial skeleton. Proinflammatory cytokines such as tumor necrosis factor (TNF)-alpha and IL-17 are released, activating cells that damage bone. IL-22, a different cytokine, promotes osteoproliferation. Sometimes both of these processes can take place at once. As a result of the development of new bone, syndesmophytes, which are regarded as a defining radiological characteristic of AS, form inside ligaments. When this process is at its worst, the axial skeleton may completely fuse.

Patients with AS have been reported to have higher levels of TNF-alpha in both serum and synovial tissue<sup>4</sup>, making it a crucial treatment target. As a result of their ability to reduce disease activity and stiffness, TNF inhibitors have been linked to a significant role in the etiology of AS. However, whether TNF inhibitors are disease-modifying in AS is still up for discussion (Tan S *et al.*, 2015). Researchers were able to provide add-

itional therapy alternatives because IL-17 and IL-23 were recognized as being involved in the pathophysiology of AS.

### **Sacroiliac changes in ankylosing spondylitis**

Grade 0: Normal

Grade 1: some blurring of the joint margins-suspicious.

Grade 2: loss of definition at the edge of the joints  
o Some sclerosis

o Minimal erosion

Grade 3: definite sclerosis on both sides of joints  
o Severe erosion with widening of joint space with or without ankylosis

o Loss of joint space

Grade 4: Complete fusion of the joints (ankylosis) (Sudol-Szopinska *et al.*, 2013).

### **2.3. Unani concept**

In Unani medicine, ankylosing spondylitis isn't directly referenced; instead, it is classified as a type of *waja-ul-mafasil* (joint pain). The primary symptom of ankylosing spondylitis is stiffness, or *salabat*, earning it the name *tehjurulmafasil*. According to *Al Akseer Azam*, prolonged joint pain can lead to immobility as the *mad'da* (fluid) within the joint solidifies, resulting in rigidity. This rigidity is attributed to the hardening of *mad'da* caused by its thickness, coldness, and stickiness. Sometimes, this condition arises due to improper treatment by physicians.

In cases of joint dislocation, the affected joint cannot fully return to its original position, as noted by *Jalinoos* (Galen) in the 18th century. The term *hutba* refers to the displacement of vertebrae forward or backward. Hakeem Mohammad Arzani discusses this extensively in *Meezanul Tib. Sheikh Abu Ali Ibn Sina* (Avicenna) noted that joints becoming immobile

are associated with dryness, while the individuals affected often have a warm temperament. He attributed the condition to deteriorated *mad'da* (humours). For treating *tahajur-e-mafasil* (joint rigidity), Ibn Sina cautioned against reducing inflammation without first *tallyin* (softening) the affected areas. The *mad'da* within the joints eventually hardens, causing rigidity, often due to cold, thick, or sticky substances. In some cases, this rigidity results from unsuitable treatments, like using cold anesthetic pastes early on, anti-inflammatory drugs, diuretics, or strong purgatives before the *nujz* (maturation) of *mad'da*.

Severe joint rigidity can prevent movement, and this condition frequently emerges after treating other diseases, such as syphilis. In his writings, *Hakeem Abul Al Hasan Al Kamri* describes *Geena Muna*, a condition where cold waste settles on the back's outer area, leading to pain. *Ibn-e-Tilmeez*, in *Al Hawashi-Al Arakiya*, notes that when this substance accumulates in the joints, it affects the joint tendons, often providing relief with proper medication, although neglect can lead to tubercular fever.

*Ali Ibn Rabban Tabri*, in *Firdausul HikmatFit Tib*, remarks that when cold, numb sensations arise in the lumbar spine and legs of a person with a phlegmatic body type, the illness becomes chronic. He also notes that the buildup of materials (*mad'da*) within the joints often causes swelling, particularly when the joints are overused.

## 2.4. Clinical features

### 2.4.1. Spinal features

Usually, low back pain and severe stiffness appear slowly over months or years, with recurrent bouts. It is possible to mistake sciatica for radiation to the buttocks or back of the

thighs. In contrast to a mechanical back pain, the symptoms are axially distributed and symmetrical. Movement eases symptoms, which are most prominent in the morning and after inactivity. Even though the lumbosacral region is typically the first and most severely afflicted, some patients only have neck or thoracic symptoms when they first show. After a few years, the entire spine may be impacted as the disease tends to progressively progress up the spine. Spinal stiffness and secondary osteoporosis, which occur when the spine gets progressively ankylosed, predispose to spinal fracture and manifest as sudden, intense, and localized pain. Secondary spinal cord compression is a rather uncommon side effect. Early physical symptoms include limitations in the lumber spine's range of motion in all directions, pain upon sacroiliac compression, and failure to completely eliminate the lumber lordosis on forward flexion. As the illness worsens, the spine becomes stiffer overall. Fusion in some people causes a severe kyphosis of the dorsal and cervical spine, which can impair forward vision. This could be crippling, especially if fixed flexion contractures in the hips or knees are present.

### 2.4.2. Extra spinal features

Due to the condition's extensive nature, the majority of patients also have additional locomotor symptoms. The involvement of the cost vertebral joints leads to "pleuritic" chest pain that is made worse by breathing. Inflammatory enthesopathy causes plantar fasciitis, Achilles tendinitis, and discomfort over bony prominences such as the greater trochanter and iliac crest. Fatigue is a common primary complaint that can be brought on by chronically disrupted sleep brought on by pain or by long-term system inflammation.

Extraspinal synovial joints may be involved in up to 40% of patients. At initially, this is typically asymmetrical and may result in inflammatory symptoms that mostly affect the hips, knees, ankles, or shoulder. Around 10% of cases of pauciarticular juvenile symptoms start in childhood and involve a peripheral joint (mostly the ankle, knee, or elbow).

Except for eye involvement, which occasionally precedes joint disease, extra-articular symptoms are generally uncommon.

**Extra-articular manifestations of ankylosing spondylitis include the following:**

**Eye conditions**

Anterior uveitis, affecting about 25% cases,

and conjunctivitis, seen in approximately 20% of patients.

**Prostate involvement**

Prostatitis, which occurs in up to 80% of men, though often without noticeable symptoms.

**Cardiovascular complications**

- Aortic valve insufficiency
- Mitral valve insufficiency
- Irregularities in heart conduction
- Inflammation of the pericardium
- Development of amyloidosis

**Pulmonary issues**

Unusual fibrotic changes in the upper lung lobes.

**Table 1. Characteristic features of inflammatory back pain.**

Age of Onset	Typically begins before the age of 40
Pain Onset	Gradual onset rather than sudden
Morning stiffness	Stiffness in the morning lasting 30 minutes or more
Pain persistence	Chronic, persisting for more than three months
Activity Relief	Pain and stiffness improve with physical activity
Rest Aggravation	Symptoms often worsen with rest or inactivity
Night Pain	Pain often disrupts sleep, particularly in the second half of the night

**2.5. Investigation**

**2.5.1. Creactive protein (CRP)**

This test is used to assess the presence of inflammation in the body.

**2.5.2. Erythrocyte sedimentation rate (ESR)**

Another method for evaluating inflammation

levels.

**2.5.3. Complete blood count (CBC)**

This test checks for anemia, which can result from the ongoing inflammation associated with ankylosing spondylitis, as well as elevated

white blood cell counts, indicating inflammation.

#### **2.5.4. HLA-B2**

The presence of this human leukocyte antigen significantly increases the likelihood of developing ankylosing spondylitis.

#### **2.5.5. X-rays or imaging studies**

While significant degenerative changes may not be evident for years, these imaging tests can help identify alterations in the joints and bones. Early detection, depending on the disease's severity, can help delay or prevent complications.

### **2.6. Radiography**

1. In the diagnosis and continuing assessment of AS, radiographic evidence of inflammatory changes in the SI joints and spine is quite helpful. Early radiographic indicators of enthesitis include the vertebral bodies becoming squared off due to erosion of their superior and inferior edges, which results in the loss of the bodies' typical concave contour with the anterior surface. The superior and inferior margins of the vertebral bodies may become sclerotic due to the inflammatory lesions at the vertebral entheses, a condition known as shining corners power. The anterior longitudinal ligament ossification and facet joint fusion may also be observed. These characteristics culminate in the traditional 'bamboo' spine.

2. Active enthesitis can be observed with Doppler ultrasonography.

### **2.7. MRI and CT scanning**

Early sacroiliitis, erosions, and enthesitis that are not visible on normal radiographs may be detected through magnetic resonance imaging (MRI) or computed tomography (CT) scanning

of the SI joints, spine, and peripheral joints. The sacroiliac joints, which connect the sacrum, which sits at the base of the spine, and the ilium, which sits at the end of the huge pelvic bone, on both sides, must develop distinctive modifications in AS patients. In the radiograph (x-ray) images, these modifications in symptoms are visible. Imaging studies like magnetic resonance imaging (MRI) are more sensitive than radiographs to detect the suspected AS and inflammation, as well as the degree of structural damage to the spine in that area, which is not visible on radiographs.

### **2.8. Blood tests:**

There are no definitive blood tests that can solely diagnose ankylosing spondylitis (AS). However, the presence of the HLA-B27 gene can aid in identifying certain patient groups at higher risk. Additionally, tests for acute phase reactants, including C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR), are valuable for detecting inflammation in various areas of the body. A rheumatologist typically plays a key role in diagnosing AS and its related conditions. Given that AS can impact different parts of the body, patients may need to consult multiple healthcare providers to assess and identify specific symptoms.

### **2.9. Management**

All spondyloarthropathies, including ankylosing spondylitis, reactive arthritis, psoriatic arthritis, enteropathic arthritis, and undifferentiated spondyloarthropathy, are typically managed through a combination of medication, exercise, and possibly physical therapy. Additional strategies such as maintaining good posture and applying heat or cold can help relax muscles and relieve

joint pain. For individuals with severe ankylosing spondylitis, surgery may be considered as an option.

The treatment plan for ankylosing spondylitis (AS) is tailored to each individual's condition. While there is currently no cure for AS, exercise and physical therapy can help prevent joint stiffness, and certain medications can alleviate pain and inflammation. Non-steroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen, naproxen, and indomethacin, are commonly used for this purpose. Other treatment options include corticosteroids like prednisone and disease-modifying antirheumatic drugs (DMARDs) such as methotrexate or sulfasalazine. Newer medications that target tumor necrosis factor (TNF) include adalimumab, etanercept, infliximab, and golimumab. However, all these treatments may have side effects, so it is essential to closely follow the physician's recommendations (S van der Linden *et al.*, 1984).

### 3. Management in Unani System of Medicine

The Usool-e-Ilaj of *Waja-ul-Mafasil* recommends the *Ilaj-bil-Ghiza*, *Ilaj-bil-Dawa*, and *Ilaj-bit-Tadbeer* regimens for treating ankylosing spondylitis. Pain relief, morbidity reduction, and patient quality of life improvement are the three main goals of treatment. *Tadil-e-Mizaj* (temperament correction), *Istifragh* (morbid matter eliminations), and *Taqwiyat-e-*

*Mafasil* (joint strengthening) are the three fundamental principles of treatment. The removal of morbid stuff from the pathological site, or *Istifragh-e-Madda* (evacuation of morbid matter), is used to correct the disturbed humor. Analgesics such as *Musakkinat* and anti-inflammatory medications such as *Muhallilat* are used to treat pain and inflammation.

*Muqawwiyat-e-Asab* (nervine tonics), *Dalk* (massage), and other forms of *Riyazat* (exercise) can all help to strengthen muscles and nerves.

The therapy regimens comprise different oral and topically applied pharmacological substances such as *Habb-e-Suranjan*, *Majoon Suranjan*, *Majoon Chobchini*, and *Majoon Ushba*. *Habbe-Asgand*, *Roghan Suranjan*, *Roghan Babuna*, *Roghan Qust*, *Roghan Kuchla* etc (Tables 1 and 2) and regimens like *Hijamah-bil-shart* (wet cupping), *Hijamah-bila-shart* (dry cupping), *Fasd* (venesection), *Irsal-e-Alaq* (leech therapy), *Dalk* (massage), *Nutool* (irrigation) etc (Table 3) (Hamdani. Usool-e-Tib. Aligarh., 2011). Movement constraints are caused by vertebral dislocation, according to eminent Unani physician Ibn Sina (980–1037 AD), who wrote about it in his book *Al Qanoon fit Tib*. He continued by explaining that pain, which may be extremely intense, may occur from the irritation of nearby nerves. Regimes like *Fasd*, *Hijamah*, and others are advantageous in these circumstances (Sina I. *Al Qanoon fit Tib.*, 2011).

**Table 2. Single Drugs for Ankylosing Spondylitis in Unani Medicine**

S. No.	Single Unani Drugs	Botanical Name	Family	Pharmacological Action
1.	<i>Suranjan Shireen</i> (Golden collyrium)	<i>Colchicum luteum</i>	<i>Liliaceae</i>	<i>Mushil</i> (purgative), <i>Muhallil</i> (Resolvent), <i>Munzij</i> (Concoctive), <i>Qabiz</i> (Constipative), <i>Dafi'-e-Alam</i> (Analgesic)

2.	<i>Chobchini</i> (China root)	<i>Smilax china</i>	<i>Liliaceae</i>	<i>Mulattif</i> (demulcent), <i>Muhallil</i> (Anti-inflammatory), <i>Muarriq</i> (diaphoretic), <i>Muharik</i> (stimulant), <i>Musakkin</i> (analgesic), <i>Munawwim</i> (sedative)
3.	<i>Farfiyun</i> (Euphorbium)	<i>Euphorbia resinifera</i>	<i>Euphorbia</i>	<i>Murakhi</i> (relaxant), <i>Muhallil</i> (Anti-inflammatory)
4.	<i>Muqil</i> (Bdellium)	<i>Commiphora-mukul</i>	<i>Burseraceae</i>	<i>Muhallil</i> (anti-inflammatory), <i>Muddir-i-bowl</i> (Diuretic), <i>Musakkin-e-Alam</i> (Analgesic), <i>Murakhi</i> (relaxant)
5.	<i>Makohkhushk</i> (Black Nightshade, dried)	<i>Solanum nigrum</i>	<i>Solanaceae</i>	<i>Muhallil</i> (Anti-inflammatory), <i>Radi'-i-Mawad</i> (divergent), <i>Mujaffif</i> (siccative), <i>Musakkin-i-Alam</i> (Analgesic)
6.	<i>Azaraq</i> (Nuxvomica)	<i>Strychnosnuxvomica</i>	<i>Loganiaceae</i>	<i>MuqawwiAasab</i> (nervine tonic)
7.	<i>Baladur</i> (Maring nut)	<i>Semecarpus anacardium</i>	<i>Anacardiaceae</i>	<i>MuqawwiAasab</i> (nervine tonic)

Table 3. Compound Drugs for Ankylosing Spondylitis in Unani Medicine

S. No	Compound Formulatiom	Ingredients	Dosage Form	Main Action
1.	<i>Habb-e-Suranjan</i>	<i>Sibr saqootri, Tukhm-e-soya, Turbudsafaid, Habb-ul-neel, Muqil, Suranjaan, Mastagi</i>	Tablet	Anti-inflammatory ( <i>Mohallil</i> )
2.	<i>Majoon Suranjan</i>	<i>Tukhm-e-Karafs, Badiyan, Mirch safed (Filfil Siyah peeled), Satar, Namak Hindi, Barge-hina, Bozeedan, Sheetraj Hindi, Beekh-e-Kibr, Gul-e-Surkh, Kishneez, Zanjbeel, Saqmoniya, Suranjan shireen</i>	Electuary	Anti-inflammatory ( <i>Mohallil</i> )



3.	<i>Habb-e-Asgand</i>	<i>Ajwain desi, Asgandh, Bidhara, Peepla Mool, Peepal, Zanjabeel, Satawar, Musli siyah, Gur (jaggery)</i>	Tablet	Anti-inflammatory ( <i>Mohalli</i> ) / analgesic ( <i>Musakhin-e-Alam</i> )
4.	<i>Habb-e-Azaraqi</i>	<i>Kuchla, Filfilsiyah, Dar-e-filfil</i>	Tablet	(Nervine tonic) <i>Muqawwi Aasab</i>
5.	<i>Habb-e-qul-e-aakh</i>	<i>Zanjabeel, Filfil Siyah, Gule Madar, Barg-e-Bans</i>	Tablet	Anti-inflammatory ( <i>Mohalli</i> ) / analgesic ( <i>Musakhin-e-Alam</i> )

**Table 4. Regimenal Therapies for Ankylosing Spondylitis in Unani Medicine**

S. No	Name of Regimenal Therapy	Definition	Site
1.	<i>HijamabilShart</i> (wet cupping)	Cupping with scarification	<i>Kahil</i> (point on the inter-scapular region below the 7th cervical vertebra), <i>Akhdein</i> (on the back of both ears), <i>Nuqra</i> (at the back of the cranium 4 inches above the neck)
2.	<i>HijamabilaShart</i>	Cupping without scarification	<i>Kahil, Akhdein, Nuqra</i>
3.	<i>Hijamahnariya</i>	Cupping with fire	<i>Kahil, Akhdein, Nuqra</i>
4.	<i>Irsal-e-Alq</i> (leech therapy)	Application of a medically bred leech, either alone or in conjunction with a unani pharmaceutical drug, to the afflicted area.	At the site of pain
5.	<i>Dalk</i> (massage)	A technique that involves applying pressure, kneading, friction, rubbing, and tapping with the hands or items like rough cloth, either with or without Roghan (oil), against the affected body parts	At the site of pain
6.	<i>Bukhoor/ Inkebab</i>	Medicated steam	At the site of pain
7.	<i>Imala</i>	Diversion of the morbid matter from the site of disease through <i>Hijamah</i> or <i>Fasd</i>	<i>Kahil, Akhdein Nuqra</i>

#### 4. CONCLUSION

Ankylosing spondylitis (AS), often referred to as spondyloarthropathy, is a chronic and painful condition primarily impacting the spine, bones, muscles, and the ligaments that connect them. This disorder often has a genetic component, meaning it tends to run in families. First-degree relatives (such as parents, siblings, and children) of individuals with AS are at a significantly increased risk compared to the general population. Currently, many non-pharmacological and pharmacological therapies are being used for the management of ankylosing spondylitis in conventional medicine. The Pharmacological medications, such as analgesics, NSAIDs, muscle relaxants, and corticosteroids, come with a heavy weight of unfavorable side effects since they must be taken regularly. Surgery has drawbacks, such as patient disobedience and surgical failures. The Unani medical system offers several therapeutic options with minimal adverse effects. By using *Ilaj-bit-Tadbeer* treatments like *Hijamah-bil-shart* (wet cupping), *Hijamahbila-shart* (dry cupping), *Irsal-i-Alaq* (leech therapy), and *Dalk* (massage), the disease's *mad'da*(cause) is treated. All of the regimental therapy discussed above provide analgesic effects and are often safe with no known side effects. To scientifically confirm the long-term effects of various therapy modalities, more study is required.

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