Annual Methodological Archive Research Review
http://amresearchreview.com/index.php/Journal/about
Volume 3, Issue 11 (2025)

Online ISSN 3007-3197
Print ISSN 3007-3189

http://amresearchreview.com/index.php/Journal/about

Gout Revisited: A Complete Review of Hyperuricemia and Crystal-Induced Arthritis

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ABSTRACT

The most common form of inflammatory arthritis, gout, develops when crystals of monosodium urate (MSU) form in joints and soft tissues, which leads to hyperuricemia. Increased purine consumption, metabolic issues, oxidative stress, and insufficient uric acid excretion all lead to high levels of urate in the blood. Because of these factors, gout is commonly associated with obesity, hypertension, and cardiovascular and chronic kidney diseases. It is now more common all over the world due to an increase in gout-derived diseases coupled with an aging population. Epidemiological studies find the cause of this increase to be an increase in poor lifestyle choices. MSU crystals form and chronic inflammation along with the development of tophi occur. This is due to local proteomics and synovial physicochemical factors. Diagnosis is confirmed through an analysis of the synovial fluid, sometimes with the aid of imaging and sometimes without. Once diagnosed, gout can be managed through adapted diets, weight loss, and medications that lower

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uric acid levels. Certain foods can lead to the uric acid level spiking and other foods can lower it. It is thought that high levels of purines, fructose, and alcohol increase the levels of urate in the blood. On the other hand, a more balanced diet, more drinking of water, and avoiding dehydration lowers the risk of a gout flare. Nonetheless, even with successful methods, numerous individuals continue to be under-involved due to insufficient compliance, slow recognition, and unawareness. A more inclusive, patient-centric method that incorporates the patient's lifestyle, diet, and continued medication management is critical to alleviating the disease burden and preventing the resulting effects from complications related to gout.

INTRODUCTION

Gouty arthritis firstly recognised by the Egyptians in 2640 BC,named as *podagra* which means acute gout occurring in the first metatarsophalangeal joint and later recognized by Hippocrates in the fifth century BC, who referred to it as 'the unwalkable disease' (Webster et al 2023). Hippocrates also mentioned the connection of the disease and an immoderate way of living, calling *podagra* to be the arthritis of the wealthy rather than rheumatism, as arthritis of the poor.

Tophi, which are deposits of crystallized monosodium urate which may develop after chronic hyper-uricemia, were first described by Galen, another Greek physician and philosopher (130-300 AD) six centuries later. Galen also identified a genetic characteristic that the Roman senator Seneca had previously mentioned. A physician from the second century named Aretaeus the Cappadocian suggested that a particular blood toxin is responsible for gout (Copeman, et al 1964). An English physician, Thomas Sydenham (1624–1689) differentiates acute gout and chronic gout. He suffered from the gout later on with kidney disease. In his influential, *A Treatise on Gout and Dropsy*, he described clinical description of this disease.

Gout is generally believed to be a disease that primarily affects men. During Nero's rule (AD 54–68), Seneca first acknowledged that women could also get gout (Benedek, et al 1997). Even though gout is still mostly a middle-aged male condition, it has become more common in women, especially after menopause, in modern times.

1.1 Stages of Gout

There are several stages that gout can progress and they are as follow:

1. Asymptomatic gout

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2. Acute gout
3. Intercritical gout
4. Chronic Tophaceous gout

1.1.1 Asymptomatic Gout

A person has elevated blood uric acid levels at this stage, but no other symptoms are present (Kutzing, et al 2008). However, there is a chance of developing gout. Patient unintentionally found it while measuring SUA (serum level greater than 7 mg/dL). The degree of hyperuricemia directly relates to the risk for gout.

Many individuals with hyperuricemia show no symptoms of the disease or even asymptomatic MSU crystal deposition (Perez-Ruiz, et al 2015). According to a latest dual energy computed tomography investigation found that MSU crystal was detected in 24% of asymptomatic individuals with blood urate concentrations greater than 9 mg/dL on imaging. The degree of hyperuricemia directly relates to the risk for gout.

1.1.2 Acute Gout (*Naqras Haad*)

An acute attack leads to acute monoarthritis. The first metatarsophalangeal joint (*podagra*), the ankle/metatarsus, the wrist, and the fingers are the joints that are most frequently afflicted. Less frequently occurring but still possible, polyarticular gout affects those who experience frequent disease flare-ups (Eggebeen, et al 2007). Uric acid crystals are deposited in joint spaces in cases of acute gout (*Naqras Haad*). Freudweiler showed that acute gout (*Naqras*) is induced by intra-articular injection of urate crystals. This is characterized by an abrupt onset of severe joint pain and swelling. Stressful situations, alcohol or drugs, or another acute illness can worsen acute gout (*Naqras Haad*), which usually begins at night (Akhtar, et al 2017).

The first attacks go away in three to ten days, and then there are more attacks months or years later. Attacks can occasionally be more frequent and last longer. Acute gout is self-limiting, and symptoms usually go away within days to weeks.

1.1.3 Intercritical Gout

Gout sufferers frequently go without symptoms between attacks of acute arthritis. Patients with intercritical gout are managed using a prevention-first approach. This

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is the interval period during which there are no symptoms in between severe episodes of gout. Joints function normally and there are no abnormalities in them as well.

1.1.4 Chronic Tophaceous Gout (*Naqras Muzmin*)

In cases of chronic tophaceous gout, significant uric acid deposits can be found in joints or soft tissues, notably in the area surrounding the pinna of the ear (Towiwat, et al 2019). Afterwards the initial gout flare, following flares happen frequently, and if untreated hyperuricaemia is present, these flares gradually increase in frequency, duration, and polyarticularity.

Chronic gouty arthritis and gouty tophi, which carry a risk of bone and joint deformity, may also develop in addition to the frequent acute inflammatory recurrence.

1.2 Pathophysiology of Gout

Hyperuricemia, or excessive amounts of uratein the body, can cause urate crystals to accumulate and settle in joints, an inflammatory reaction occurs, which leads to gouty arthritis (Parthasarathy, et al 2018). It may cause sudden flare ups of pain, tenderness, and other symptoms. Temporarily having elevated uric acid levels is not a sign of gout. Several hyperuricemic individuals never develop gout.

When body breaks down purine rich compounds that are present in some foods, it produces uric acid that leads to gout. Uric acid leaves the body through urine after being removed from the circulation by the kidneys. Sometimes, body overproduces uric acid, or when the kidneys cannot effectively eliminate it from the blood.

Gout can cause irreversible joint damage, if gout is not treated. The buildup of uric acid in soft tissues and joints is referred to as tophus (Chhana, et al 2015). Other health issues that certain gout sufferers can experience severe arthritis and changes to the shape of their joints (joint deformity). Gout occur when blood uric acid level raise 7mg/dL in male and 6mg/dL in female. Uric acid is usually eliminated from the body through the kidneys after dissolving in the blood. The blood becomes supersaturated with high level of uric acid (hyperuricemia), either as because of increased production due to purine enriched diet or decreased excretion (as in kidney disease).

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Excessive amount purine nucleosides in mammals get eliminated from the body through renal excretion and liver breakdown (Stone, et al 2012). The final byproduct of human purine metabolism is uric acid. Humans and primates (great ape cousins) can only convert purines into uric acid because they do not have a functional uricase enzyme, in contrast to other mammals. Humans and their great ape cousins lack a functioning uricase due to order of mutational silencing actions. Purine metabolism involves enzymes like AMP deaminase, adenosine deaminase,5-nucleotidase, purine nucleoside phosphorylase, guanine deaminase, and xanthine oxidase catalyze the numerous steps of reactions that make up the metabolic pathways.

The metabolism of purine that are natural substance, present in wide range of food (organ meat, red meat, alcohol and certain vegetables) and body cells mainly leads to gouty arthristis (Zhang, et al 2022). Uric acid is produced when purines are broken down into hypoxanthine from DNA, RNA, ATP, and cAMP and then into xanthine and further into uric acid with the help of an enzyme named as xanthine oxidase (XO). The xanthine oxidoreductase enzyme primarily works in the liver to further degrade UA and the xanthine. (XOR), which may be found in either the xanthine oxidase forms (XO) or xanthine dehydrogenase (XDH).

Uric acid begins to crystallize and form sharp, needle-shaped monosodium urate (MSU) crystals when its concentration rises above a certain level (above 6.8 mg/dL), particularly around less warm body parts like the toes, specifically the synovial fluid (lubricating fluid in the joint space), where these crystals accumulate inside joints. These crystals are identified by the immune system as foreign invading organism. White blood cells (neutrophils and macrophages) try to absorb and eliminate them in retaliation (Armstrong, et al 2024).

A protein complex, NLRP3 inflammasome is activated as a result of this immune response within immune response. This activation leads to the release of interleukin-1 beta (IL-1β), which is inflammatory cytokines (proinflammatory cytokines) that promotes inflammatory response against foreign body in human body. The inflammation is accelerated by these cytokines, which draw further immune cells to the area. The result is an acute gout attack, which causes the joint to become red, swollen, hot, and severely painful (Grassi, et al 2011).

The end result in humans is UA. However, in utmost animals, UA is additionally

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converted by and enzyme uricase into 5-hydroxyisourate, thus finally allantoin created, it is extremely solvable and eagerly evacuated. Humans and their great ape cousins lack a functioning uricase due to a order of mutational silencing actions. Urate levels in humans are substantially higher, averaging between 240 and 366 mol/L associated to other animals, which typically have uric acid in the array of 30–120 mol/L.

XO-derived ROS contribute to vascular endothelial damage. In pathological conditions like MI and ischemia-reperfusion, XO activity is increased (Schmidt, et al 2019). Tissue damage is induced, neutrophils are drawn in, and ROS are released when XO activity is elevated. XOR manages the release of inflammatory cytokines. Nuclear factor kB activity or plasma IL-6 level has been associated with elevated plasma XOR activity. Through the activation of the NLRP3 inflammasome, XOR regulates the secretion of IL-1β in mouse macrophages. XOR inhibitors have been shown to improve endothelial dysfunction in patients with smoking, sleep apnea syndrome (SAS), diabetes mellitus with mild hypertension, and chronic heart disease. ROS are generated when oxidation of NADPH is induced by uric acid, which also raised oxidative stress (Glantzounis, et al 2005). According to a number of studies, uric acid causes mitochondrial dysfunction. Hyperuricemic rats experienced higher levels of oxidative stress accumulation and mitochondrial DNA damage. Although the exact mechanism of uric acid-induced mitochondrial damage is unidentified, it is thought to be related to NADPH oxidase's generation of ROS. It is now evident that the pathophysiology of atherosclerosis, cardiovascular events, chronic kidney diseases CKD and hypertension HTN involves the NLRP3 inflammasome.

Solubility of monosodium urate crystals MSU is generally affected by, temperature, pH, proteins, ions and connective tissues (Chhana, et al 2015). As the temperature decreases, urate becomes less soluble in chloride or water solution. On the basis of in vitro data, determined by Leob, solubility of urate was at level of 6.8 mg/dLat physiological temperature. At physiological pH, uric acid is a mild diprotic acid. Crystals of monosodium form around the joints when the solubility of uric acid changes. Acute gout that develops into chronic gout is caused by the crystals' formation (Pascual, et al 2015). This condition affects a large portion of the small number of people who have hyperuricemia.

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According to Portugues missionary who visited Japan in 16th century, Japan had relatively few gout patients unlike in Europe. In 1898, first gout patient was reported in Japan. The prevelance of gout increases as people started to adopt the western lifestyle in 1960. Gout was uncommon until the end of World War II. Currently, areas without predominantly western lifestyle have low uric acid level (Johnson, et al 2005).

1.3 Epidemiology of Gout

Incidences and prevalence of gout on global scale varied from 0.1% to 0.3% that is higher in men than women, with prevalence of 3:1 and 10:1. The prevalence rises from 11 to 13% and incidence rises 0.4% of gout among individuals older than 80 years.

According to several epidemiological studies conducted in variety of nations, gout referred as the most prevalent inflammatory arthritis, particularly in males (Dehlin, et al 2020). It is rare in female before to menopause, and its occurrence has increased. The confounding influence of estrogen in young female and premenopausal women has poor level due to estrogen uricosuric action of estrogen. According to epidemiologic research, mean SUA levels in males climbed to the level 390mol/L from the level less than 210 mol/L. High Uric acid levels are very common as 21 % of the male and 22% of females were accused of high uric acid levels the past few decades. An increase in Age, sex, body mass related incidence and prevalence contributed to other risk factors like alcohol consumption, obesity, diabetes, are the most significant demographic factors that influence serum uric acid concentrations (Zheng, et al 2017).

According to the Population Health Survey, the percentage of overweight or obese Hong Kong residents rose from 38.8% in 2003–2004 to 50.0% in 2014–2015. In America the frequency of gout was double from 1996 to 1985. It has grown to this high level in two decades and matches to this crucial level of prevalent hyperuricemia leading to Gout.

In one research, African males had lower SUA than Caucasian men, but others reported that black people had more SUA than white people. However, the first research was conducted in South Africa, whereas the second was led in the US.

The most prevalent inflammatory arthritis in adults worldwide is gout, which is

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more prevalent in men, the elderly, and members of racial and ethnic minorities (Kuo, et al 2015). Minorities in the US, Han Chinese, New Zealand Maori, and certain Asian racial groups are more likely to have gout.

1.4 Causes of Gouty Arthritis

In Unani system of Medicine, arthritis is named as *Waja-ul-Mufasil*. Diseases occur due to imbalance of humors (*Akhlat)* in human body. According to Hippocrate, gout (*Naqras*) is caused by an excessive buildup of one of the body's humors (*Akhlat*), most likely phlegm, which causes pain, swelling, redness in and around the joint.

There are several reasons why uric acids may become more supersaturated. Sometimes it's difficult to determine what's causing elevated uric acid levels. Elevated absorption of purine is mostly due to increased consumptions of purine rich diet like meat, sweetbread, especially alcohol (Lockyer, et al 2016). Inosine monophosphate (IMP) and guanine monophosphate (GMP) are produced by the HGPRTs enzyme from hypoxanthine and guanine, respectively. Deficiency of this enzyme lead to accumulation of purine that cause hypeuricemia and eventually it causes gouty arthritis. Absence of HGPRTs cause a genetic disorder called as Lesch Nyhan syndrome. Mutation of hypoxanthine guanine phosphorylase transferase on X chromosome causes hyperuricemia, leads to gout.

1.5 Risk Factors

Gout is primarily caused by elevated uric acid levels, which leads to the buildup of monosodium urate crystals (MSU) in and around the joints (synovial fluid), that cause damages to the joints (Cha, et al 2024). Previous research has shown that 50% of gout patients have a diagnosis of hypertension and that over 70% of patients suffer from obesity and other kidney related deaths. Additionally, diuretics raise blood uric acid level that eventually causes gout. Gouty arthritis is significantly influenced by a diet rich in purines, such as red meat.

Alcoholics are also prone to gout. Both increased uric acid production and decreased uric acid excretion through the kidney are linked to alcoholic beverages. Gout was first defined by Hippocrates through the Golden Age of Greece as it is the disease of riches and it is affecting the middle aged men affecting the wealthy higher class (Mihai, et al 2015). In the human body, decomposition (breakdown of) of uric acid occurs in the gut, while the kidneys typically eliminate two-thirds of uric acid.

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Gout is caused by elevated blood uric acid level, which may also raise the probability of diabetes and cardiovascular disease.

The kidney filters the majority of the circulating uric acid, with around 90% of the filtrate freight reabsorbed by the renalproximal tubule. Uric acid buildup may cause by reduced evacuation, which occurs when renal function is compromised or when diuretics or certain other drugs are taken (Marangella, et al 2005). The renal management of UA is difficult since it is also prone to tubular secretion. Obesity and the MetS are highly associated with increased SUA levels. Epidemiological research studies have shown that obesity, hypertension HTN and body mass index (BMI) are risk factors for incidents gout. The chance of developing gout is 1.64 and 2.11 times higher for hypertensive people than for normotensive people. Many researchers have found that high uric acid level rise the chance of evolving HTN independently of other risk factors. The association among UA level and HTN weakens with growing patient age and period of HTN, indicating that UA may be particularly essential in fresher with timely onset HTN (Borghi, et al 2022).

METS prevalence rose considerably between 1994 and 2006, with abdominal fatness being a major. The globally rise in the occurrence of hyperuricemia is thought to be unswervingly connected to the rising prevalence of MetS and obesity in both emerging and developed nations. Factually, the high level of UA found in MetS was related to high insulin levels because it inhibits UA excretion from the kidney class.

Hyperuricemia, on the other hand, frequently heads the progress of hyperinsulinemia diabetes and obesity (Becker, et al 2006). It is generally understood that the insulin increases the glucose consumption by increasing blood tide to the tissues. UA reduces arterial dilatation, it prevents insulin act, leading in enhanced insulin resistance and hyperinsulinemia. The association might potentially be due to insulin's stimulating influence. Individuals with the metabolic syndrome frequently have elevated plasma uric acid levels. Gout provided a hazard ratio of 1.26 for any MI, according to the first study to properly control for multiple comorbidities. Women with gout seem to be much more likely than men to have MI. Gout patients have a higher risk of stroke, according to recent UK studies (Seminog, et al 2013). Gout and cerebrovascular accidents seem to be related, but hyperuricemia by itself

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does not lead to the risk of stroke. Women suffering from gout have higher risk of stroke than men, according to a retrospective cohort study that controlled for several co-founders.

The life style and environment have great effects on the health many studies have samples of both the urban and rural to understand the consequence. People who lived in cities frequently reported having higher SUA levels. Living in urban setting worsens the inclination toward raised SUA levels, which is associated with greater intake of urate inducing items such as sugar-sweetened drinks and alcohol (Major, et al 2018). A rich in sugar diet also give rise to the production of the serum uric acid levels because the fructose component.

People with gout frequently have several medical conditions that coexist with their gouty arthritis, which can make managing and treating gout more challenging. Although studies have yielded contradictory results, hyperuricemia identified as a risk factor for the onset and progression of CKD. Since the beginning of this century, chronic kidney disease has emerged as the world's most serious challenge. The number of patients with renal transplants and end-stage kidney disease has increased, and their mortality rate has increased tenfold (Wetmore, et al 2016). Dialysis CVD and other disorders are caused by improper kidney function. The MetS is defined in numerous ways. NCEP-ATP III advices released by the AHA are among the most frequently used definitions. Mets interconnect the causing factors which cause high risk of type-2 diabetes and CVD.

It has been proposed that UA causes MetS through increasing insulin confrontation. It is generally understood that the insulin increases the glucose consumption by increasing blood tide to the tissues. UA reduces arterial dilatation, it prevents insulin act, leading in enhanced insulin resistance and hyperinsulinemia (Bahadoran, et al 2022). People with MetS who are neither overweight nor obese may also have high level of uric acid (hyperuricemia). MetS affects up to 76% of gouty arthritis sufferers.

Sucrose is the primary cradle of fructose worldwide, accounting for more than 90% of all energetic sweeteners consumed. Nevertheless, in the United States, it is customary to utilize corn syrup, which is derived from maize and is readily accessible and less costly.

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Sugar beets produced an increasing amount of sugar throughout the 18th century. Sucrose is a fructose and glucose disaccharide generated by greenies used as a food ingredients and table sugar (Zaitoun, et al 2018). Because fructose is a component of sucrose, greater sugar consumption will result in higher fructose consumption. Although fruits contain considerable amounts of fructose, the most commonly fructose is found to be in the candies, sweets and sweetened drinks.

1.6 Dietary Recommendation

Gout may be managed, and gout flare ups are significantly less frequent in people having blood uric levels below 6 mg/dL. Foods high in estrogen, such as pecans and almonds, are known to have uricosuric effects, are best dietary recommendation for women (Soetedjo, et al 2025). Cherries and blackberries are examples of antioxidants. Due to high vitamin C content in cherries, uric acid is excreted in urine with more frequency.

In mice with gout, a diet rich in β-carotin and green tea powder decreased joint pain and swelling, decreased serum uric acid (UA) and inflammatory cytokines that promotes inflammation like TNF-α, IL-1β, and IL-6.

1.7 Dietary Restriction

Avoid eating a lot of red meat, sweets, and high-purine foods like tuna and sardines (Kaneko, et al 2024). Salmon, scallops, trout, turkey, veal, anchovies, bacon, goose, heart, liver, mussels, mutton, pheasant, sardine, and sweet breads should avoid. It is actually best to limit all forms of alcohol; it frequently increases urate production, which promotes hyperuricemia and subsequently gout.

Foods with high purine content should be avoided because they contribute to the development of gout. Only lettuce, endives, dodder, and celery are allowed since they are the least harmful to gouty individuals. The food items which produce flatulence, for example cauliflower, brinjal, arvi, beef etc. should be avoided. These all are called as Badi ghizayen, should be restricted in Gout (Naqras).

1.8 Symptoms of Gout

Main symptom of gout is the presence of chalk like substance that is named as tophi in joints and soft tissues which mostly develop in chronic gout. Severe pain in one and more joint is most common in gouty arthritis. A gout flare usually lasts a few

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hours, during which time uric acid crystals cause joint pain, redness, warmth, and swelling (Vambe, et al 2025). A gout flare typically affects one joint, usually the big toe (metacarpophalangeal joint), but it can also occasionally affect several joints, such as the feet, ankles, knees, and wrists. Symptoms of gout last 5-7 days and disappear without medical intervention. Chronic gouty arthritis can develop as a result of repeated attacks that harm the joint over time.

1.9 Diagnosis of Gout

Physicians usually diagnose gout through physical examination, medical history of patient and laboratory test. Clinical diagnosis includes the presence of six of twelve criteria to confirm the diagnosis.

- Peripheral joint swelling
- Pain and tenderness
- Tophi formation
- High level of serum uric acid
- Negative joint fluid culture during attack
- Asymmetric swelling within joint on x-ray
- Redness around and over joint
- Monarthritis
- Maximum inflammation development within 24 hours
- Warmth over joint due to urate crystals
- More than one attack of acute arthritis
- Unilateral attack of first metatarsophalangeal joint

For gout to be diagnosed there must be at least one episode of peripheral joint swelling, pain, or tenderness (Robinson, et al 2014). A hierarchical set of seven criteria, organized in the clinical, laboratory, and imaging domains, is used if the detection of Monosodium urates in synovial fluid is not deemed diagnostic for gout.

1.9.1 Investigations

- Blood test to access the elevated serum uric acid
- Urine test to access elevated uric acid level
- Synovial fluid aspiration and crystal analysis

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- X-ray
- Ultrasonography
- A Dual energy CT scan DECT, a type of computed tomography CT-scan
- MRI (Magnetic resonance imaging)

When it came to diagnosing gout, DECT demonstrated a comparatively high sensitivity and specificity. The analysis's findings indicate that the pooled sensitivity is 88 percent with the specificity of 90 percent. A recent time, ultrasonography has been suggested for diagnosis purposes. Diagnosis of gout, according to meta-analysis, US (ultrasonography) can be useful in the diagnosis of gout which provides accurate diagnosis with high pooled sensitivity and specificity of 65.1% and 89% respectively.

Synovial fluid aspiration is a standard diagnostic procedure of gouty arthritis, but it could be challenging to perform due to pain and discomfort (Courtney, et al 2009). American college of physician ACP advised clinicians to perform synovial fluid aspiration in case of diagnostic test required for patient with suspected acute gout. Knee is the most common symptomatic joint, followed by wrist, ankle and metatarsal joint. Synovial fluid aspiration method performed most frequently in both gouty arthritis and CCP arthritis.

1.10 Treatment of Gout

Although it takes a while to treat gout, Hippocrates suggested relieving acute pain first before try to eliminate waste product (uric acid) from the body. Hab e suranjan has been used for thousands of years to treat gout (Zaidi, et al 2022). It not only successfully alleviates the symptoms of gouty arthritis but also lowers uric acid levels, which are the primary cause of the condition.

Since the first century AD, Colchicum autumnale has been used to treat swelling and different forms of inflammatory arthritis. Colchicum autumnale (*Soranjan shirin*) yields the alkaloid colchicine. In the Unani School system, C. automnale has been used as a purgative. It is currently recommended to treat gout (*Naqras*). Colchicine reduces urate phagocytosis and inhibits subsequent inflammatory events by preventing neutrophil migration to the area where urates being deposited.

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ULT (Urate-lowering therapy) should aim for a SUA (Serum Uric Acid) target of below than 6 mg/dl, according to the 2012 ACR recommendations. These guidelines are chronic gouty arthritis, gout patient with CKD (stage 2-5), recurrent kidney stones, three to four gout flares per year, overproduction of uric acid and elevated serum uric acid.

Most widely used allopathic drugs for treatment ofacute gouty arthritis is through Colchicine, corti-costeroid and NSAIDs, for the prevention of recurrent gout (Terebuh, et al 1999). Inhibition of uric acid synthesis (Allopurinol), increase excretion of uric acid (sulphinpyrazone), anti-inflammatory (NSAIDs), uric acid oxidation therapy, on basis of mechanism of action is being used to treat gouty arthritis.

According to EULAR guideline, required dosage for Allopurinol is >300mg. It is not necessary to treat asymptomatic hyperuricemia until acute gout, tophus, renal stones developed. According to the ACR 2012 Guidelines for Management of Gout, these objectives can be achieved by combining pharmacologic and nonpharmacologic treatment, patient education, and an accurate assessment of acute gouty arthritis (Engel, et al 2017).

Conclusion

The evolution of gout focuses on unremitting hyperuricemia and its underlying metabolic, dietary, genetic, and other chronic causes. The literature documenting this phenomenon is extensive. The formation and deposition of monosodium urate crystals are the fundamental cause of the acute and chronic sequelae related to gout. The more serious sequelae from gout, other than chronic musculoskeletal disability, are from its systemic manifestations of cardiovascular, renal, and hypertension diseases. The fundamental cause of gout and the other comorbidities is the formation of urate crystals, and the modern rheumatologist, with the help of easily available and effective diagnostic techniques, is still unable to optimize the outcome of the gout patient. This is substantially due to poorly controllable patient issues of awareness, compliance, and the long-term management of gout. The modern rheumatologist also has available empiric lifestyle changes that can augment the urate-lowering medication to significantly enhance the probable outcomes. These lifestyle changes are dietary control, weight reduction, and decreased purine and

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Print ISSN 3007-3189
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fructose consumption. The evolution of this specialty now depends on the coordinated efforts of interconnected educational, administrative, and customized medical therapies, as these are likely to mitigate...

References

Armstrong, C. E., & Mason, L. (2024). Physiology of red and white blood cells. *Anaesthesia & Intensive Care Medicine*.

Akhtar, H., Rashid, M., Siddiqi, M., & Ahmad, Q. Z. (2017). Role of Hijama'(Cupping Therapy) in the Management of Niqras (Gouty Arthritis). *J Arthritis*, *6*(256), 2.

Bahadoran, Z., Mirmiran, P., Kashfi, K., & Ghasemi, A. (2022). Hyperuricemia-induced endothelial insulin resistance: the nitric oxide connection. *Pflügers Archiv-European Journal of Physiology*, *474*(1), 83-98.

Becker, M. A., & Jolly, M. (2006). Hyperuricemia and associated diseases. *Rheumatic Disease Clinics*, *32*(2), 275-293.

Borghi, C., Agnoletti, D., Cicero, A. F. G., Lurbe, E., & Virdis, A. (2022). Uric acid and hypertension: a review of evidence and future perspectives for the management of cardiovascular risk. *Hypertension*, *79*(9), 1927-1936.

Benedek, T. G. (1997). Presidential Address: Gout in Women: A Historical Perspective. *Bulletin of the History of Medicine*, *71*(1), 1-22.

Chhana, A., & Dalbeth, N. (2015). The gouty tophus: a review. *Current Rheumatology Reports*, *17*(3), 19.

Chhana, A., Lee, G., & Dalbeth, N. (2015). Factors influencing the crystallization of monosodium urate: a systematic literature review. *BMC musculoskeletal disorders*, *16*(1), 296.

Cha, Y., Lee, J., Choy, W., Lee, J. S., Lee, H. H., & Chae, D. S. (2024). Pathophysiology and treatment of gout arthritis; including gout arthritis of hip joint: a literature review. *Hip & pelvis*, *36*(1), 1.

Copeman, W. S. C. (1964). *A short history of the gout and the rheumatic diseases*. Univ of California Press.

Courtney, P., & Doherty, M. (2009). Joint aspiration and injection and synovial fluid analysis. *Best Practice & Research Clinical Rheumatology*, *23*(2), 161-192.

Dehlin, M., Jacobsson, L., & Roddy, E. (2020). Global epidemiology of gout:

Online ISSN 3007-3197
Print ISSN 3007-3189
http://amresearchreview.com/index.php/Journal/about

prevalence, incidence, treatment patterns and risk factors. *Nature Reviews Rheumatology*, *16*(7), 380-390.

Engel, B., Just, J., Bleckwenn, M., & Weckbecker, K. (2017). Treatment options for gout. *Deutsches Ärzteblatt International*, *114*(13), 215.

Eggebeen, A. T. (2007). Gout: an update. *American family physician*, *76*(6), 801-808.

Glantzounis, G. K., Tsimoyiannis, E. C., Kappas, A. M., & Galaris, D. A. (2005). Uric acid and oxidative stress. *Current pharmaceutical design*, *11*(32), 4145-4151.

Grassi, W., & De Angelis, R. (2011). Clinical features of gout. *Reumatismo*, *63*(4), 238.

Johnson, R. J., Titte, S., Cade, J. R., Rideout, B. A., & Oliver, W. J. (2005, January). Uric acid, evolution and primitive cultures. In *Seminars in nephrology* (Vol. 25, No. 1, pp. 3-8). WB Saunders.

Kaneko, K., Tsuruga, K., Takayanagi, F., Fukuuchi, T., Yamaoka, N., Seki, R., & Fujimori, S. (2024). Daily Amount of Purine in Commonly Recommended Well-Balanced Diets in Japan and Overseas. *Nutrients*, *16*(23), 4066.

Kuo, C. F., Grainge, M. J., Zhang, W., & Doherty, M. (2015). Global epidemiology of gout: prevalence, incidence and risk factors. *Nature reviews rheumatology*, *11*(11), 649-662.

Kutzing, M. K., & Firestein, B. L. (2008). Altered uric acid levels and disease states. *The Journal of pharmacology and experimental therapeutics*, *324*(1), 1-7.

Lockyer, S., & Stanner, S. (2016). Diet and gout–what is the role of purines?.

Marangella, M. (2005). Uric acid elimination in the urine. *Contributions to nephrology*, *147*, 132-148.

Mihai, B. M., & Lăcătuşu, C. M. (2015). Gout-a disease for the elect. *Romanian Journal of Artistic Creativity*, *3*(1).

Major, T. J., Topless, R. K., Dalbeth, N., & Merriman, T. R. (2018). Evaluation of the diet wide contribution to serum urate levels: meta-analysis of population based cohorts. *bmj*, *363*.

Pascual, E., Addadi, L., Andrés, M., & Sivera, F. (2015). Mechanisms of crystal formation in gout—a structural approach. *Nature Reviews Rheumatology*, *11*(12), 725-730.

Parthasarathy, P., & Vivekanandan, S. (2018). Urate crystal deposition, prevention

Online ISSN 3007-3197
Print ISSN 3007-3189
http://amresearchreview.com/index.php/Journal/about

and various diagnosis techniques of GOUT arthritis disease: a comprehensive review. *Health information science and systems*, *6*(1), 19.

Perez-Ruiz, F., Dalbeth, N., & Bardin, T. (2015). A review of uric acid, crystal deposition disease, and gout. *Advances in therapy*, *32*(1), 31-41.

Robinson, P. C., & Horsburgh, S. (2014). Gout: joints and beyond, epidemiology, clinical features, treatment and co-morbidities. *Maturitas*, *78*(4), 245-251.

Seminog, O. O., & Goldacre, M. J. (2013). Gout as a risk factor for myocardial infarction and stroke in England: evidence from record linkage studies. *Rheumatology*, *52*(12), 2251-2259.

Soetedjo, N. N. M. (2025). The role of nutrition in various endocrine and metabolic diseases. *Clinical Nutrition Open Science*.

Schmidt, H. M., Kelley, E. E., & Straub, A. C. (2019). The impact of xanthine oxidase (XO) on hemolytic diseases. *Redox biology*, *21*, 101072.

Stone, T. W., & Simmonds, A. (2012). *Purines: basic and clinical aspects*. Springer Science & Business Media.

Terebuh, B., & Notter, N. (1999). The Functional Capacity. *Occupational Low Back Pain: Aggressive Nonsurgical Care*, 91.

Towiwat, P., Chhana, A., & Dalbeth, N. (2019). The anatomical pathology of gout: a systematic literature review. *BMC musculoskeletal disorders*, *20*(1), 140.

Vambe, S. D., Mchavi, C. V., Hough, E., & Bronkhorst, E. (2025). Crystals of pain: navigating gout and its management. *South African General Practitioner*, *6*(1), 14-20.

Wetmore, J. B., & Collins, A. J. (2016). Global challenges posed by the growth of end-stage renal disease. *Renal Replacement Therapy*, *2*(1), 15.

Webster, C. (2023). Hippocrates' Diseases 4 and the Technological Body. *Body and Machine in Classical Antiquity*, 155.

Zheng, R., Chen, C., Yang, T., Chen, Q., Lu, R., & Mao, Y. (2017). Serum Uric Acid Levels and the Risk of Obesity: a Longitudinal Population-Based Epidemiological Study. *Clinical laboratory*, (10).

Zaitoun, M., Ghanem, M., & Harphoush, S. (2018). Sugars: Types and their functional properties in food and human health. *International Journal of Public*

Online ISSN 3007-3197
Print ISSN 3007-3189

Health Research, *6*(4), 93-99.

Zaidi, Z., Nazir, S., Bano, U., Nasir, A., & Jabeen, F. (2022). Suranjan-A potent antiarthritic drug of unani medicine for geriatric population. *Annals of Geriatric Education and Medical Sciences*, *9*(2), 40-43.

Zhang, Y., Chen, S., Yuan, M., Xu, Y., & Xu, H. (2022). Gout and diet: a comprehensive review of mechanisms and management. *Nutrients*, *14*(17), 3525.