

New developments in the treatment of hyperuricemia: A focus on innovative natural therapies

Dr. Yadala Prapurna Chandra ^{1,*}, Kongi Kavyasudh ² and Kaveti Suchithra ³

¹ Principal of Rathnam Institute of Pharmacy, Pidathapolur, Nellore. Ph.D. in Pharmacology, KLE University, Belgaum, India.

² Faculty- Associate Professor of Pharmacology, Rathnam Institute of Pharmacy, Pidathapolur, Nellore. M.Pharm. in Pharmacology, Sree Venkateshwara University, Tirupati, India.

³ Pursuing Bachelor of Pharmacy at Rathnam Institute of Pharmacy, Pidathapolur, Nellore, India.

World Journal of Biology Pharmacy and Health Sciences, 2025, 21(01), 126-131

Publication history: Received on 26 November 2024; revised on 01 January 2025; accepted on 04 January 2025

Article DOI: <https://doi.org/10.30574/wjbphs.2025.21.1.0001>

Abstract

Gout, an ongoing metabolic problem portrayed by the statement of monosodium urate (MSU) gems in joints, is basically determined by hyperuricemia, an overabundance of uric corrosive in the blood. This survey article investigates the most recent advancements in imaginative regular treatments for treating hyperuricemia, zeroing in on their adequacy and security in decreasing uric corrosive levels and reducing side effects. It features the job of dietary alterations, including consuming organic products, vegetables, and explicit regular mixtures, in overseeing hyperuricemia. The survey distinguishes potential normal treatment choices that can be custom-made to individual patient requirements, stressing the significance of way of life changes close by regular cures. Moreover, it examines the advantages and restrictions of these treatments, upholding for a customized way to deal with treatment that improves patient results and personal satisfaction. The article highlights the need for additional examination to comprehend the instruments and ideal dosing of these regular cures completely. By advancing proof-based practices and cultivating cooperation between medical services experts and analysts, this survey means to propel information on inventive regular treatments for hyperuricemia, eventually adding to further developed administration systems for people impacted by this condition.

Keywords: Gout; Hyperuricemia; Monosodium urate (MSU) crystals; Metabolic disorder; Natural treatments; Uric acid levels

1. Introduction

Gout is a persistent metabolic problem described by the statement of monosodium urate (MSU) precious stones in the joints, prompting irritation and tissue harm. It ordinarily presents as intense, self-restricting fiery monoarthritis, essentially influencing the joints of the lower appendages, especially the large toe. Raised serum urate levels, known as hyperuricemia, are the essential gamble factor for MSU precious stone statement and the advancement of gout. While customarily saw as an issue of purine digestion, late exploration features the job of modified urate transport in the stomach and kidneys in the pathogenesis of hyperuricemia [1].

By and large, gout has been alluded to as "the infection of rulers," representing societal position because of its relationship with the utilization of rich food varieties and liquor, which were more available to the high society. Be that as it may, gout has developed into a critical worldwide general medical problem [2].

* Corresponding author: Y. Prapurna Chandra

Gout is a sort of joint inflammation that causes serious torment, expanding, and firmness, generally in the joint at the foundation of the huge toe. The primary driver of gout is having a lot of uric corrosive in the body, with roughly half of beginning assaults happening in the huge toe. Other ordinarily impacted joints incorporate the knees, feet, lower legs, midtarsal joints, hands, wrists, fingers, and elbows.

Strangely, numerous people with hyperuricemia don't foster gout or structure uric corrosive precious stones. Truth be told, just around 5% of people with hyperuricemia levels over 9 mg/dL will encounter gout. Gout is frequently thought to be a "man's illness," as it dominantly influences men thriving, with a predominance of 1-2% in Western nations and roughly 3.4 million American men. Postmenopausal ladies can likewise be impacted, yet they address just around 5% of all out cases in the US [3].

2. Symptoms and presentation

Gout is portrayed by unexpected episodes of extreme agony, expanding, and firmness in the impacted joints [4]. The most ordinarily impacted joint is the large toe, with different joints that might impacted include:

- Knees
- Feet
- Lower legs
- Midtarsal joints
- Hands and wrists
- Fingers
- Elbows

Gout can be classified into two types

- **Intense GOUT:** Portrayed by abrupt beginning of side effects, normally influencing 1-3 joints. Flares might last a couple of days to seven days, with side effects dying down between assaults.
- **Constant GOUT:** Includes more continuous flares (at least two every year) and may influence various joints. Constant gout can prompt super durable joint harm and firmness[5].

3. Causes and risk factors

While the specific reasons for gout stay muddled, a few laid out risk factors add to its turn of events:

- **Diet:** Food sources high in purines, like red meat, fish, and liquor, can increment uric corrosive levels.
- **Orientation:** Men are 4 to multiple times bound to foster gout than ladies. Ladies' gamble increments present menopause due on the deficiency of estrogen, which makes defensive impacts.
- **Age:** The gamble of gout increments with age, with numerous people encountering their most memorable episode somewhere in the range of 30 and 50 years.
- **Race:** African American men are almost two times as prone to report having gout contrasted with Caucasian men.
- **Family Ancestry:** Hereditary inclination assumes a critical part, with specific qualities impacting kidney and stomach capability.
- **Overabundance Weight:** Overweight people are at a higher gamble of creating gout.
- **Meds:** Certain prescriptions, like diuretics and low-portion anti-inflammatory medicine, can build the gamble of hyperuricemia and gout assaults.
- **Ongoing Renal Disappointment:** Weakened kidney capability can prompt the gathering of uric corrosive.
- **Trigger Occasions:** Occasions like a medical procedure, injury, or unexpected weight reduction can set off gout flares.
- **Hyperuricemia:** The Primary driver of Gout

Hyperuricemia is characterized as serum urate levels surpassing 6.0 mg/dL in ladies and 7.0 mg/dL in men. It can result from expanded creation or diminished discharge of uric corrosive. The kidneys assume a significant part in uric corrosive end, and renal under-discharge represents 90% of hyperuricemia cases. Raised uric corrosive levels can prompt the arrangement of MSU gems, which can cause irritation and torment in the joints [6].

4. Diagnosis and tests

Analysis of hyperuricemia and gout ordinarily includes:

- **Blood Tests:** To quantify uric corrosive levels.
 - **Urine Tests:** To evaluate uric corrosive and creatinine levels.
 - **Joint Liquid Examination:** To distinguish the presence of MSU precious stones.
 - **Imaging:** X-beams might be utilized to recognize joint harm.
-

5. Treatment of hyperuricemia

Treatment choices for hyperuricemia include:

5.1. Drugs:

- **Xanthine Oxidase Inhibitors:** Like allopurinol and febuxostat, which decrease uric corrosive creation.
- **Uricosuric Specialists,** For example, benzbromarone, which increment uric corrosive discharge.
- **Recombinant Uricase:** Utilized in serious cases.

5.2. Natural remedies

- Remaining hydrated
- Restricting purine-rich food sources
- Drinking cherries, lemon juice, apple juice vinegar, turmeric, ginger, and green tea[7].
- Overseeing weight and keeping away from sugar and liquor

5.3. Natural sources

- **Lemon:** Plentiful in flavonoids, phenolic compounds, L-ascorbic acid, and terpenoids, lemon advances collagen amalgamation and ligament fix, supports keeping up with the resistant framework, and goes about as a cancer prevention agent. It might likewise work as a pain relieving, lessening skeletal, joint, or solid torment[8].
- **Oranges:** Containing flavonoids, carotenoids, polyphenols, and L-ascorbic acid, oranges assist with bringing down uric corrosive levels by helping the kidneys in flushing out abundance uric corrosive. A day to day glass of squeezed orange or lemon water can be especially gainful for generally invulnerability and digestion [9].
- **Strawberries:** Loaded with anthocyanins, flavonoids, and L-ascorbic acid, strawberries assist with changing over uric corrosive into a more dissolvable structure for simpler discharge. Their rich cell reinforcement content additionally lessens aggravation related with gou[10].
- **Pineapple:** Pineapples contain bromelain, quercetin, and L-ascorbic acid, which can bring down uric corrosive levels and forestall gout. Bromelain lessens aggravation, while fiber helps flush out abundance uric corrosive[11].
- **Banana:** Low in purines and high in L-ascorbic acid, bananas assist with diminishing uric corrosive levels. They additionally contain potassium, which supports uric corrosive evacuation through pee [12].
- **Apple:** Apples are wealthy in fiber and malic corrosive, which help retain and kill uric corrosive. Green apples, specifically, have a higher fiber content, making them viable in diminishing uric corrosive levels.
- **Papaya:** With its low calorie content and high fiber, papaya upholds weight reduction and detoxification. The potassium in papaya decreases uric corrosive collection in the blood[13].
- **Avocados:** Low in purines and plentiful in vitamin E, avocados assist with decreasing aggravation and control uric corrosive levels. They additionally contain monounsaturated fats that help generally wellbeing[14].
- **Mixed Greens:** These vegetables are low in purines and high in fiber, which assimilates and eliminate overabundance uric corrosive. They additionally assist with alkalizing the body, supporting urea discharge.
- **Broccoli:** Broccoli is low in purines and high in L-ascorbic acid, which can assist with decreasing uric corrosive levels and increment urinary discharge. Its cancer prevention agent properties likewise battle aggravation [15].
- **Pumpkin:** Wealthy in fiber and cancer prevention agents, pumpkin retains uric corrosive and decrease irritation. Its phytochemicals additionally support generally wellbeing [16].
- **Celery:** Celery contains compounds with calming properties that can assist with decreasing uric corrosive levels. It likewise advances kidney capability, supporting uric corrosive end[17].
- **Cucumbers:** High in water and fiber, cucumbers assist with flushing out uric corrosive. Their low purine content settles on them a protected decision for overseeing uric corrosive levels[18].

- **Tomatoes:** Tomatoes are low in purines and plentiful in L-ascorbic acid, which helps separate and discharge uric corrosive. Their cell reinforcement properties additionally add to decreasing aggravation[19]
- **Almonds:** Almonds are low in purines and high in fiber, which helps absorption and the end of abundance uric corrosive. They likewise contain vitamin E, which lessens irritation[20].
- **Cashews:** Low in purines, cashews contain magnesium, which upholds kidney capability and helps eliminate abundance uric corrosive. Their sound fats additionally control fat digestion[21].
- **Dates:** Dates are low in purines and wealthy in potassium and fiber, which further develop kidney capability and assist with eliminating uric corrosive from the circulatory system[22].
- **Pistachios:** These nuts are low in purines and contain cancer prevention agents and fiber, which assist with decreasing oxidative pressure and backing kidney wellbeing.
- **Pecans:** Pecans contain omega-3 unsaturated fats and cell reinforcements that decrease irritation and backing kidney capability, assisting with flushing out overabundance uric corrosive.
- **Green Tea:** Wealthy in catechins and flavonoids, green tea might assist with bringing down uric corrosive levels through its cell reinforcement properties and expected consequences for urate carriers[23]
- **Ginger:** Ginger's mitigating properties can assist with lessening uric corrosive levels. It very well may be consumed as tea or utilized in cooking to ease aggravation[24].
- **Turmeric:** Containing curcumin, turmeric has calming and cell reinforcement properties that can assist with keeping up with solid uric corrosive levels[25].
- **Espresso:** A few investigations propose that espresso might assist with decreasing uric corrosive levels because of its chlorogenic corrosive substance, which might smother purine breakdown and further develop kidney capability.

Notwithstanding these cures, overseeing purine admission is essential. Food varieties that are low in purines, like almonds, eggs, and most products of the soil, ought to be empowered, while high-purine food sources like red meat, fish, and liquor ought to be restricted or kept away from. This dietary methodology can altogether help with controlling uric corrosive levels and forestalling related medical problems[26].

6. Lifestyle modifications:

Way of life changes assume a vital part in overseeing hyperuricemia and gout. Suggestions include:

- **Dietary Changes:** Spotlight on low-purine food sources, like organic products, vegetables, entire grains, and low-fat dairy items.
- **Ordinary Activity:** Keeps a sound weight and work on generally speaking wellbeing.
- **Stress The executives:** Lessening pressure can assist with forestalling eruptions [27].

7. Conclusion

This review article highlights the developing meaning of imaginative regular treatments in the administration of hyperuricemia. These normal cures, which envelop plant removes, dietary enhancements, and way of life changes, present a more secure and more savvy option in contrast to customary pharmacological medicines. The discoveries propose that these treatments help in decreasing uric corrosive levels as well as lighten related side effects, tending to the hidden reasons for hyperuricemia. Besides, the article advocates for a customized treatment approach that tailors mediations to individual patient requirements. It is fundamental to develop how we might interpret the components and ideal doses of these normal solutions for augment their adequacy. Furthermore, upgrading patient schooling and mindfulness in regards to the advantages of normal treatments and way of life changes is pivotal for further developing wellbeing results. By coordinating these inventive methodologies into clinical practice, we can encourage better administration of hyperuricemia, eventually improving the personal satisfaction for impacted people.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

References

- [1] A review on gout: Looking back and looking ahead. -Haolin Tao and at all. Journal Title: International Immunopharmacology. volume 117, April 2023, 109977.
- [2] Update on the epidemiology, genetics, and therapeutic options of hyperuricemia. -Lijun Li, Yipeng Zhang, Changchun Zeng.- American journal of translational research 12[7], 3167,2020.
- [3] Zollner, N.; Dofel, W. and Grobner, W.: The uricosuric action of benzbromarone in healthy subjects. *Klinische Wochenschrift* 48: 426 (1970).
- [4] Natural Ways to Reduce Uric Acid in the Body. Author- Medically reviewed by Darragh O' Carroll, MD- written by Noreen Iftikhar, MD- Updated on February 6, 2024.
- [5] Medically reviewed by Jared Meacham, PhD., RD, CSCS — Written by Bria Horne on July 27, 2023
- [6] Hyperuricemia and Progression of Chronic Kidney Disease: A Review from physiology and pathogenesis to the role of Urate-Lowering Therapy.-Tao Han Lee and at all.
- [7] Some phytochemical, pharmacological and toxicological properties of ginger (*Zingiber officinale* Roscoe): a review of recent research Badreldin H Ali, Gerald Blunden, Musbah O Tanira, Abderrahim Nemmar *Food and chemical Toxicology* 46 (2), 409-420, 2008.
- [8] Lemon juice antioxidant activity against oxidative stress Safaa Ali *Baghdad Science Journal* 17 (1 (Suppl.)), 0207-0207, 2020.
- [9] Phytochemical analysis of Citrus limonum pulp and peel Blessy B Mathew, Suresh K Jatawa, Archana Tiwari *Int J Pharm Pharm Sci* 4 (2), 369-71, 2012
- [10] Strawberry and human health: Effects beyond antioxidant activity Francesca Giampieri, José M Alvarez-Suarez, Maurizio Battino *Journal of agricultural and food chemistry* 62 (18), 3867-3876, 2014.
- [11] Phytochemical constituents and proximate analysis of dry pineapple peels TF Owoeye, DK Akinlabu, OO Ajayi, SA Afolalu, JO Popoola, OO Ajani *IOP Conference Series: Earth and Environmental Science* 993 (1), 012027, 2022.
- [12] Bananas and gout: Are they okay to eat? Medically reviewed by Jared Meacham, PhD., RD, CSCS — Written by Zia Sherrell, MPH on June 27, 2023.
- [13] An overview of papaya: Phytochemical constituents and its therapeutic applications SB Nagarathna, SK Jain, HR Arun, PS Champawat, Renu Mogra, JK Maherchandani, *Pharma Innovation Journal* 10 (9), 45-49, 2021.
- [14] Avocado (*Persea americana* Mill) and its phytoconstituents: potential for cancer prevention and intervention Taylor E Collignon, Cassidy Webber, Josh Piasecki, Austin SW Rahman, Arijit Mondal, Sandra Maria Barbalho, Anupam Bishayee *Critical Reviews in Food Science and Nutrition*, 1-21, 2023.
- [15] Potential health benefits of broccoli-a chemico-biological overview-Hannah R Vasanthi, Subhendu Mukherjee, Dipak K Das *Mini reviews in medicinal chemistry* 9 (6), 749-759, 2009.
- [16] Medicinal and biological potential of pumpkin: an updated review-Mukesh Yadav, Shalini Jain, Radha Tomar, GBKS Prasad, Hariom Yadav *Nutrition research reviews* 23 (2), 184-190, 2010.
- [17] Phytochemical analysis of some celery accessions- Alaa Al-Din Helaly, Jun Pill Baek, Emad Mady, MHZ Eldekashy, Lyle Craker *Journal of Medicinally Active Plants* 4 (1-2), 2015.
- [18] Phytochemical and therapeutic potential of cucumber- Pulok K Mukherjee, Neelesh K Nema, Niladri Maity, Birendra K Sarkar *Fitoterapia* 84, 227-236, 2013.
- [19] Bioactivities of phytochemicals present in tomato-Poonam Chaudhary, Ashita Sharma, Balwinder Singh, Avinash Kaur Nagpal *Journal of food science and technology* 55, 2833-2849, 2018.
- [20] A systematic review of phytochemical and phytotherapeutic characteristics of bitter almond Behzad Moradi, Saeid Heidari-Soureshjani, Majid Asadi-Samani, Qian Yang *International Journal of Pharmaceutical and Phytopharmacological Research* 7, 1-9, 2017.
- [21] Comparative studies of the phytochemical, antioxidant and antimicrobial properties of cashew leaf, bark and fruits extracts- John O Onuh, Gabriel Idoko, Peter Yusufu, Felicia Onuh *American Journal of Food and Nutrition* 5 (4), 115-120, 2017.

- [22] Date fruit and its by-products as promising source of bioactive components: A review Noemí Echegaray, Beatriz Gullón, Mirian Pateiro, Ryszard Amarowicz, Jane M Misihairabgwi, José M Lorenzo Food Reviews International 39 (3), 1411-1432, 2023.
- [23] Phytochemical constituents and antibacterial activity of some green leafy vegetables Ramesa Shafi Bhat, Sooad Al-Daihan Asian Pacific journal of tropical biomedicine 4 (3), 189-193, 2014.
- [24] Phytochemical and pharmacological importance of turmeric (*Curcuma longa*): A review Sayantani Chanda, TV Ramachandra Research & Reviews: A Journal of Pharmacology 9 (1), 16-23, 2019
- [25] Review of phytochemical and nutritional characteristics and food applications of Citrus L. fruits Shuxun Liu.
- [26] Phytochemicals and health aspects of pistachio (*Pistacia vera* L.)- Navindra P Seeram, Yanjun Zhang, Susan Bowerman, David Heber Tree Nuts, 309-318, 2008.
- [27] Cancer preventive and therapeutic potential of banana and its bioactive constituents: a systematic, comprehensive, and mechanistic review Arijit Mondal. Frontiers in oncology 11, 697143, 2021