LUPINE PUBLISHERS

Concepts of Dairy & Veterinary Sciences

DOI: 10.32474/CDVS.2021.04.000187

ISSN: 2637-4749

Review Article

Role of Vitamin C in Prevention and Management of Hyperuricemia: A Review

Ayan Chatterjee[1]* and Kaushiki Ganguly[2]

[1]*Assistant Professor, Department of Physiology, Guru Nanak Institutions, Telangana*

[2]*Haldia, West Bengal*

***Corresponding author:** Ayan Chatterjee, Assistant Professor, Department of Physiology, Guru Nanak Institutions, Telangana, Hyderabad, India

Received: March 17, 2021 **Published:** March 30, 2021

Background

Uric acid, a waste product normally present in the blood which produce after the breakdown of purines. The condition when serum uric acid elevated [≥7mg/dl in male, ≥6mg/dl in female] is known as hyperuricemia. Elevated uric acid can form crystals in the joints that cause gout [1]. Hyperuricemia is the major cause of producing gout. About 85%-90% of people develop hyperuricemia because of under excretion of urate while its over production occurs in the body. Hyperuricemia is not the only cause of development of gout. Monosodium urate monohydrate crystals modulate in the joints in the presence of various nucleating agents like insoluble collagens, chondroitin sulfate, cartilage fragments and other crystals when the intra-articular fluid is dehydrated in low temperature [2]. Moreover, vitamin C is a water-soluble micro nutrient that has anti-oxidental properties to prevent the oxidative damage by free radicals and protect the tissues [3]. In previous different studies it has been shown that, vitamin C also have uricosuric effect. It has a potential effect in lowering serum uric acid level that is beneficial for hyperuricemic patients as well as for gout patient. Vitamin C lowers the serum uric acid level by increasing urinary excretion of uric acid [4]. In this backdrop the present study has been undertaken to assess the effect of Vitamin C on lowering serum uric acid level, so that whether vitamin C can be used in the treatment of hyperuricemia patient as well as gout patient or not.

Materials and Methods

Electronic search has been carried out using the databases viz. Google, Google Scholar, PubMed for the study. The search will be restricted for a period of 19 years ranging from 2000-2019.

Findings and Discussions

Earlier studies reported that, higher doses of vitamin C inversely related with low serum uric acid level [5]. Another study reported that the risk of gout decreases with increasing vitamin C, intake upto 45%lower risk at the top Vitamin C intake category of 1500 mg or more. Another study reported that, supplementation with vitamin C as low as 500 mg daily for 2 month reduces serum uric acid by 0.5 mg/dl [6]. The uricosuric effect of Vitamin C helps in the management of hyperuricemia. Vitamin C intake from through diet or supplements increases the Glomerular Filtration Rate. The anti-oxidental effect of vitamin C reduces the microvascular ischemia in glomeruli and leads to increased blood flow the site. It also dilated the afferent arterioles to increases the blood flow. It competed with sodium and potassium ions for reabsorption that exerts osmotic effects [7]. Another possible mechanism of vitamin C to reduce uric acid level is to compete with uric acid for reabsorption via anion-exchange transport system. At proximal tubule vitamin C exhibit uricosuric effect through cis-inhibition of URATE-1 [Urate transporter-1] or sodium ion dependent anion co-transporter [A12/SLC5A8] or both in proximal tubules [8]. Vitamin C and uric acid possess similar anti-oxidant functions. It has been noted that loss of ability to synthesize endogenous vitamin C in human is associated with inability to break down uric acid to soluble all Antonin so clearly vitamin C intake through diet or any supplement reduces the risk of hyperuricemia.

Conclusion

From the present study it may be concluded that, Vitamin C is associated with considerable reduction in serum uric acid level.

References

1. Clemens Z (2016) Vitamin C and Disease: Insights from the Evolutionary Perspective. Journal of Evolution and Health 1: 1-22.
2. Choi HK, Gao X, Curhan G (2009) Vitamin C Intake and the Risk of Gout in Men- A Prospective Study. Arch Intern Med 169: 502-507.
3. Kensarah OA, Azzeh FS (2012) Implementing High Vitamin C Treatments to Decrease Blood Uric Acid Levels in Hyperuricemic Saudi Patients. Journal of American Science 8: 462-467.
4. Milind P, Sushila K, Neeraj S (2013) Understanding Gout beyound Doubt. International Research Journal of Pharmacy 4: 25-34.
5. Prasad C, Iqbal U, Westfall S, Prakash S (2017) Management of Hyperuricemia and Gout by Prebiotics and Probiotics. International Journal of Probiotics and Prebiotics 12: 5-16.
6. Rai SK, Fung TT, Lu N, Keller SF, Curhan GC, et al. (2017) The Dietary Approaches to Stop Hypertension [DASH] Diet, Western Diet, and Risk of Gout in Men: Prospective Cohort study. Research 357(1794): 1-8.
7. Saigal R, Agarwal A (2015) Pathogenesis and Clinical Management of Gouty Arthritis. Journal of the Association of Physicians of India 63: 56-63.
8. Suresh E, Das P (2012) Recent Advances in Management of Gout. Q J Med 105: 407-417.

DOI: 10.32474/CDVS.2021.04.000187