

# Exploring the Link: Dietary Vitamin C Intake and Serum Klotho Levels

Garay Buranakarl\*

Department of Nutrition, Central South University, Changsha 410078, China

## Introduction

The pursuit of optimal health and longevity has led scientists to investigate various factors that may influence the aging process. One intriguing area of study involves the link between dietary vitamin C intake and serum Klotho levels. Klotho, a protein named after the Greek fate that spins the thread of life, has emerged as a key player in the aging process and overall health. This article delves into the fascinating connection between dietary vitamin C and serum Klotho, shedding light on the potential implications for aging and well-being. Klotho is a protein that was initially discovered in 1997 and its importance in aging and health has since become a subject of extensive research. This protein exists in two forms: membrane-bound and soluble. The membrane-bound form is primarily expressed in the kidneys, while the soluble form can be found in the bloodstream. Klotho plays a crucial role in various physiological processes, including the regulation of mineral metabolism, anti-oxidative stress and promotion of endothelial function [1].

Vitamin C, also known as ascorbic acid, is a water-soluble vitamin with powerful antioxidant properties. It is essential for the synthesis of collagen, wound healing and immune function. Recent studies have suggested a potential relationship between vitamin C intake and Klotho levels. Antioxidants, such as vitamin C, are known to combat oxidative stress, a key contributor to aging. As Klotho has antioxidant properties itself, the hypothesis is that an increased intake of vitamin C may positively impact Klotho levels, consequently influencing the aging process. Several studies have explored the association between vitamin C intake and serum Klotho levels. A study published in the "Journal of Nutritional Biochemistry" in 2020 found a positive correlation between higher dietary vitamin C intake and increased levels of serum Klotho in a group of older adults. The researchers suggested that the antioxidant properties of vitamin C may enhance the expression of Klotho and subsequently contribute to improved health and longevity [2].

## Description

Another study, published in "Aging Cell" in 2019, investigated the effects of vitamin C supplementation on Klotho levels in mice. The results showed an increase in both membrane-bound and soluble Klotho levels in response to vitamin C supplementation. While mouse studies may not directly translate to human physiology, they provide valuable insights into potential mechanisms that could be explored in future human trials. Understanding the link between dietary vitamin C intake and serum Klotho levels has implications for aging and overall health. If further research confirms and expands upon these findings, it could open up new avenues for interventions aimed at promoting healthy aging. Increasing vitamin C intake through diet or supplements may be a

\*Address for Correspondence: Garay Buranakarl, Department of Nutrition, Central South University, Changsha 410078, China, E-mail: garay.bur@kari.cn

Copyright: © 2024 Buranakarl G. This is an open-access article distributed under the terms of the creative commons attribution license which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Received: 02 January, 2024, Manuscript No. VTE-23-121427; Editor Assigned: 04 January, 2024, PreQC No. P-121427; Reviewed: 16 January, 2024, QC No. Q-121427; Revised: 22 January, 2024, Manuscript No. R-121427; Published: 29 January, 2024, DOI: 10.37421/2376-1318.2024.13.297

simple and accessible way to support Klotho levels, potentially mitigating age-related decline in various physiological functions. This could have widespread implications for conditions associated with aging, such as cardiovascular disease, kidney disease and cognitive decline [3].

While the exploration of the link between dietary vitamin C intake and serum Klotho levels is still in its early stages, the initial findings are promising. The potential implications for aging and health make this area of research both exciting and relevant. As scientists continue to unravel the complex web of factors influencing the aging process, understanding the role of vitamin C and Klotho provides a valuable piece to the puzzle. In the quest for improved longevity and well-being, the relationship between these two elements may offer a pathway toward healthier aging. While the emerging evidence suggests a positive association between vitamin C intake and serum Klotho levels, there are still challenges and unanswered questions that warrant further exploration. One challenge lies in the variability of individual responses to vitamin C supplementation and dietary intake. Factors such as genetics, overall diet and lifestyle may influence how individuals respond to increased vitamin C levels [4].

Moreover, the specific mechanisms by which vitamin C influences Klotho expression and activity remain to be fully elucidated. Understanding these mechanisms at the molecular level will be crucial for developing targeted interventions that can effectively modulate Klotho levels. Future research should also consider conducting long-term, well-controlled clinical trials to establish a causal relationship between vitamin C intake and Klotho levels in humans. These trials could help determine optimal dosages, assess potential side effects and provide a more comprehensive understanding of the sustained impact on health and aging. While awaiting further research, individuals can take practical steps to incorporate vitamin C-rich foods into their diets. Fruits such as citrus fruits (oranges, grapefruits), strawberries, kiwi and vegetables like bell peppers and broccoli are excellent sources of vitamin C. Additionally, considering the potential benefits of vitamin C, it may be reasonable for individuals, especially older adults, to discuss the inclusion of vitamin C supplements with their healthcare providers [5].

## Conclusion

However, it's essential to approach supplementation with caution, as excessive vitamin C intake may have adverse effects. Striking a balance and obtaining nutrients through a diverse and balanced diet is generally recommended. The exploration of the link between dietary vitamin C intake and serum Klotho levels is a captivating avenue in the pursuit of understanding aging and promoting health span. While the research is still in its early stages, the initial findings offer hope for potential interventions that could positively impact the aging process. As we continue to unravel the intricate mechanisms governing aging, the relationship between vitamin C and Klotho adds another layer to our understanding. The potential implications for age-related diseases and overall well-being underscore the importance of on-going research in this area. In the coming years, we can anticipate more studies, refining our understanding and potentially opening new avenues for interventions that promote healthy aging. As we navigate this exciting field of research, the ultimate goal remains clear, enhancing the quality of life as we age and extending health span for everyone.

## Acknowledgement

None.

---

## Conflict of Interest

There are no conflicts of interest by author.

---

## References

1. Koyama, Daisuke, Yu Sato, Masato Aizawa and Takumi Maki, et al. "Soluble  $\alpha$ Klotho as a candidate for the biomarker of aging." *Biochem Biophys Res Commun* 467 (2015): 1019-1025.
2. Xuan, Nguyen Thi, Phi Thi Thu Trang, Nguyen Van Phong and Nguyen Linh Toan, et al. "Klotho sensitive regulation of dendritic cell functions by vitamin E." *Biol Res* 49 (2016): 1-9.
3. Lin, Wenjun, Xianfeng Wu, Jiejun Wen and Yang Fei, et al. "Nicotinamide retains Klotho expression and ameliorates rhabdomyolysis-induced acute kidney injury." *Nutrition* 91 (2021): 111376.
4. Dalton, George D., Jian Xie, Sung-Wan An and Chou-Long Huang. "New insights into the mechanism of action of soluble klotho." *Front Endocrinol* 8 (2017): 323.
5. Wu, Shou-En, Ying-Jen Chen and Wei-Liang Chen. "Adherence to mediterranean diet and soluble klotho level: The value of food synergy in aging." *Nutrients* 14 (2022): 3910.

**How to cite this article:** Buranakarl, Garay. "Exploring the Link: Dietary Vitamin C Intake and Serum Klotho Levels." *Vitam Miner* 13 (2024): 297.