

Magnesium Citrate



Available in 120 vegetarian capsules

Discussion

Magnesium—the fourth most abundant mineral in the body—participates in over 300 enzymatic reactions in nearly all tissues. Deficiency is common. The average American diet is thought to provide about 40% of the daily magnesium need, and reports from the World Health Organization have suggested that three quarters of Americans fall short of the daily requirement.^[1] Furthermore, because magnesium is predominantly an intracellular cation, serum magnesium remains a poor predictor of tissue magnesium content and availability; therefore, deficiency can sometimes go undetected.^[1] Magnesium deficiency can result from poor dietary intake, poor absorption, and excessive losses through urine, stool, perspiration, or lactation. Certain drugs, certain herbs, poor kidney function, excessive alcohol intake, and drinking mostly “soft” water can contribute to magnesium depletion.^[1,2] It is also important to note that physical and emotional stresses increase the need for magnesium and that hypomagnesemia and stress potentiate each other’s negative effects.^[3,4] Moreover, the adrenergic effects of psychological stress cause movement of magnesium from intracellular to extracellular space, which increases urinary excretion and depletion of body stores.*^[4,5]

Magnesium participates in the development and maintenance of bones and teeth; the metabolism of carbohydrates, proteins, and fats; the formation of cells and tissues; the modulation of cytokines; and the maintenance of muscle function, including the heart.^[1,6,7] Magnesium, in the form of magnesium citrate, is often used in the short term for bowel movement support, and some individuals find it useful for preventing calcium crystallization in the kidneys.*

Bioavailability

In vitro and in vivo research has demonstrated superior solubility and bioavailability of magnesium citrate compared to magnesium oxide.^[8] A 60-day randomized, double-blind, placebo-controlled, parallel intervention study compared a daily dose of 300 mg of elemental magnesium as magnesium citrate to the oxide and chelate forms. In this study (n=46), magnesium citrate showed the greatest increase in

Clinical Applications

- » Supports Magnesium Nutritional Adequacy*
- » Supports the Numerous Metabolic Activities of Magnesium in the Body*
- » Facilitates Bowel Movement*
- » Helps Prevent Calcium Crystallization in the Kidneys*

*Magnesium plays a vital role in hundreds of metabolic activities. The mineral particularly supports muscle and nervous system function. **Magnesium Citrate** supports healthy bowel movement by attracting water when it is in the intestine.**

magnesium concentration in the 24-hour and 60-day post-supplementation serum and saliva specimens.*^[9]

Bowel Movement Support

Magnesium citrate is a magnesium salt with citric acid in a 1:1 ratio. The bioavailability and pharmacokinetics of various magnesium salts correlate with their structure/activity relationship. Magnesium citrate is considered to be a purgative because it relaxes the bowel and pulls water into the intestine. This, in turn, softens the stool and stimulates movement of the muscles in the colon, leading to a bowel movement.*

Kidney Support

According to studies on magnesium and citrate, increased water intake and supplementation with magnesium or citrate help bind calcium and prevent its crystallization and aggregation—actions that support kidney health.^[10,11] In one study, magnesium citrate was found to inhibit the growth of stone fragments after extracorporeal shock wave lithotripsy.^[12] In other research, calcium phosphate and calcium oxalate deposits were higher in individuals with low urinary citrate levels.*^[13]

Other Research

A sampling of studies on PubMed indicates that at doses of 300-500 mg/d, magnesium citrate also has roles in supporting sleep quality,^[14] improving metabolic markers (e.g., fasting insulin and C-peptide) in overweight individuals,^[15] maintaining healthy blood pressure already within the normal range,^[16] and reducing nighttime leg cramps.^[17] These varied effects illustrate the many metabolic and physiological roles of magnesium and the usefulness of magnesium in citrate form.*

Magnesium Citrate Supplement Facts

Serving Size: 1 Capsule

	Amount Per Serving	%Daily Value
Magnesium (as magnesium citrate)	100 mg	25%

Other Ingredients: HPMC (capsule), stearic acid, medium-chain triglyceride oil, magnesium stearate, and silica.

DIRECTIONS: Take one capsule daily, or as directed by your healthcare practitioner.

Consult your healthcare practitioner prior to use. Individuals taking medication should discuss potential interactions with their healthcare practitioner. Do not use if tamper seal is damaged.

DOES NOT CONTAIN: Wheat, gluten, corn, yeast, soy, animal or dairy products, fish, shellfish, peanuts, tree nuts, egg, ingredients derived from genetically modified organisms (GMOs), artificial colors, artificial sweeteners, or artificial preservatives.

STORAGE: Keep closed in a cool, dry place out of reach of children.



References

1. Long S, Romani AM. Role of cellular magnesium in human diseases. *Austin J Nutr Food Sci*. 2014 Nov 18;2(10). [PMID: 25839058]
2. Swaminathan R. Magnesium metabolism and its disorders. *Clin Biochem Rev*. 2003 May;24(2):47-66. [PMID: 18568054]
3. Seelig MS. Consequences of magnesium deficiency on the enhancement of stress reactions; preventive and therapeutic implications (a review). *J Am Coll Nutr*. 1994 Oct;13(5):429-46. [PMID: 7836621]
4. Vink R, Nechifor M, eds. *Magnesium in the Central Nervous System*. Adelaide, South Australia: University of Adelaide Press; 2011. <https://www.adelaide.edu.au/press/titles/magnesium/magnesium-ebook.pdf>. Accessed September 26, 2016.
5. Galland L. Magnesium, stress and neuropsychiatric disorders. *Magnes Trace Elem*. 1991-1992;10(2-4):287-301. [PMID: 1844561]
6. Nielsen FH. Effects of magnesium depletion on inflammation in chronic disease. *Curr Opin Clin Nutr Metab Care*. 2014 Nov;17(6):525-30. [PMID: 25023192]
7. Kramer JH, Spurney C, Iantorno M, et al. Neurogenic inflammation and cardiac dysfunction due to hypomagnesemia. *Am J Med Sci*. 2009 Jul;338(1):22-27. [PMID: 19593099]
8. Lindberg JS, Zobitz MM, Poindexter JR, et al. Magnesium bioavailability from magnesium citrate and magnesium oxide. *J Am Coll Nutr*. 1990 Feb;9(1):48-55. [PMID: 2407766]
9. Walker AF, Marakis G, Christie S, et al. Mg citrate found more bioavailable than other Mg preparations in a randomised, double-blind study. *Magnes Res*. 2003 Sep; 16(3):183-91. [PMID: 14596323]
10. Guerra A, Meschi T, Allegri F, et al. Concentrated urine and diluted urine: the effects of citrate and magnesium on the crystallization of calcium oxalate induced in vitro by an oxalate load. *Urol Res*. 2006 Dec;34(6):359-64. [PMID: 16953377]
11. Caudarella R, Vescini F. Urinary citrate and renal stone disease: the preventive role of alkali citrate treatment. *Arch Ital Urol Androl*. 2009 Sep;81(3):182-87. [PMID: 19911682]
12. Abdel-Halim RE. Urolithiasis in adults. Clinical and biochemical aspects. *Saudi Med J*. 2005 May;26 (5):705-13. [PMID: 15951854]
13. Phillips R, Hanchanale VS, Myatt A, et al. Citrate salts for preventing and treating calcium containing kidney stones in adults. *Cochrane Database Syst Rev*. 2015 Oct 6;(10):CD010057. [PMID: 26439475]
14. Nielsen FH, Johnson LK, Zeng H. Magnesium supplementation improves indicators of low magnesium status and inflammatory stress in adults older than 51 years with poor quality sleep. *Magnes Res*. 2010 Dec;23(4):158-68. [PMID: 21199787]
15. Chacko SA, Sul J, Song Y, et al. Magnesium supplementation, metabolic and inflammatory markers, and global genomic and proteomic profiling: a randomized, double-blind, controlled, crossover trial in overweight individuals. *Am J Clin Nutr*. 2011 Feb;93(2):463-73. [PMID: 21159786]
16. Bullarbo M, Ödman N, Nestler A, et al. Magnesium supplementation to prevent high blood pressure in pregnancy: a randomised placebo control trial. *Arch Gynecol Obstet*. 2013 Dec;288(6):1269-74. [PMID: 23715924]
17. Roffe C, Sills S, Crome P, et al. Randomised, cross-over, placebo controlled trial of magnesium citrate in the treatment of chronic persistent leg cramps. *Med Sci Monit*. 2002 May; 8(5):CR326-30. [PMID: 12011773]

Additional references available upon request

All XYMOGEN® Formulas Meet or Exceed cGMP Quality Standards.

*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.