

Study shows magnesium optimizes vitamin D status

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A randomized trial by Vanderbilt-Ingram Cancer Center researchers indicates that magnesium optimizes vitamin D status, raising it in people with deficient levels and lowering it in people with high levels.

The study reported in the December issue of *The American Journal of Clinical Nutrition* is important because of controversial findings from ongoing research into the association of [vitamin D](#) levels with colorectal [cancer](#) and other diseases, including a recent report from the VITAL trial. It gave confirmation to a prior observational study in 2013 by the researchers that linked low [magnesium](#) levels with low vitamin D levels.

The trial also revealed something new—that magnesium had a regulating effect in people with high vitamin D levels. The research provides the first evidence that magnesium may play an important role in optimizing vitamin D levels and preventing conditions related to vitamin D levels.

Qi Dai, MD, Ph.D., Ingram Professor of Cancer Research, the study's lead author, described the ideal level as being in the middle range of a U-shape because vitamin D at this level has been linked to the lowest risk of cardiovascular disease in previous observational studies.

However, vitamin D was not related to cardiovascular disease in the recent VITAL trial. He and Martha Shrubsole, Ph.D., research professor of Medicine, Division of Epidemiology, are investigating the role that magnesium may play with cancer as part of the Personalized Prevention of Colorectal Cancer Trial.

"There's a lot of information being debated about the relationship between vitamin D and colorectal cancer risk that is based upon observational studies versus clinical [trials](#)," Shrubsole said. "The information is mixed thus far."

They became interested in a role for magnesium because people synthesize vitamin D differently with levels of the vitamin in some individuals not rising even after being given high dosage supplements.

"Magnesium deficiency shuts down the vitamin D synthesis and

metabolism pathway," Dai said.

The randomized study involved 250 people considered at risk for developing [colorectal cancer](#) because of either risk factors or having a precancerous polyp removed. Doses of magnesium and placebo were customized based on baseline dietary intake.

"Vitamin D insufficiency is something that has been recognized as a potential health problem on a fairly large scale in the U.S.," Shrubsole said. "A lot of people have received recommendations from their health care providers to take vitamin D supplements to increase their levels based upon their blood tests. In addition to vitamin D, however, magnesium deficiency is an under-recognized issue. Up to 80 percent of people do not consume enough magnesium in a day to meet the recommended dietary allowance (RDA) based on those national estimates."

Shrubsole stressed that the magnesium levels in the trial were in line with RDA guidelines, and she recommended dietary changes as the best method for increasing intake. Foods with high levels of magnesium include dark leafy greens, beans, whole grains, dark chocolate, fatty fish such as salmon, nuts and avocados.

Provided by Vanderbilt University Medical Center

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