

A lot of you have been asking me about recent headlines claiming that use of multivitamins and selected vitamins or minerals may increase the risk of mortality - and that supplemental calcium use may decrease the risk of mortality.

Some of the headlines have gone as far to say that **vitamins can kill you**.

What is the truth? Should you throw those vitamins and minerals away, or are they safe for you to use?

The answer is - some are and some aren't.

First let me start with a brief description of the study and the results (Mursu et al, Archives of Internal Medicine, 171: 1625-1633, 2011). The data for this report were obtained from the **Iowa Women's Health Study. 38,722 older women (average age 61.6, range of ages = 55 to 69) were enrolled in the study and followed for 19 years.**

The women enrolled in the study filled out extensive questionnaires in 1986, 1997 and 2004 that provided information on their **diet, lifestyle, health and supplement intake.**

The supplements evaluated on the questionnaire were multivitamins and individual B complex, A, beta- carotene, B6, folic acid, C, D, E, calcium, copper, magnesium, selenium and zinc supplements. Supplements like omega-3 fatty acids, probiotics and polyphenols were not included in this study because their health benefits were not recognized in 1986.

During the 19 years covered by the study, 15,594 of the women (40.2%) died.

When the data were adjusted for age and calorie intake use of B complex, C, D, E and calcium supplements were associated with a **slightly lower risk of death** and supplemental copper intake was associated with a significantly higher risk of death than non-supplement use.

When the data were further adjusted for medical conditions and lifestyle differences between the two groups at the time of entry into the study supplemental calcium intake was associated with a decreased risk of death, use of multivitamins and supplemental B6 or iron were associated with a slight increased risk of death and use of copper supplements was associated with a significantly increased risk of death.

And when the data were even further adjusted for dietary differences between the two groups, supplemental calcium intake was still associated with a decreased risk of death, use of multivitamins and supplemental B6, folic acid, magnesium, zinc or iron were associated with a slight increased risk of death and use of copper supplements was associated with a significantly increased risk of death.

In analyzing any study like this the best place to start is to analyze its strengths and weaknesses.

Its strengths are obvious. It is a very large study and it followed people for a long time (19 years).

However, its weaknesses are many:

1) As the authors have admitted, it is an observational study and does not prove cause and effect.

In non-scientific language, this means that this study does not prove that vitamin use increases the risk of death, only that it is associated with increased risk of death under the particular conditions of the study. Thus, it is important to carefully examine the conditions of the study to see if there are confounding factors that might have contributed to the results.

2) The data initially showed an increased risk of death only associated with copper intake. It had to be extensively massaged before any other adverse associations became apparent.

3) The authors also observed that several of their conclusions were not supported by previous studies.

Again, when you see this kind of discordance between one study and several previous studies, further studies should be performed to confirm or refute the results of the study before recommendations are made to the general public.

And when this kind of discordance arises, it is also important to examine possible confounding variables to see if there are some unique variables that may have contributed to the results of the study.

In my opinion, there are at least two confounding variables that merit further evaluation.

3a) While the vitamin users had slightly better diet and lifestyle than the non-supplement users, those differences were fairly small.

However, the use of estrogen hormone replacement therapy was almost twice as prevalent in the supplement users than the non-users. That is a concern because use of hormone replacement therapy is known to be associated with a significantly increased risk of death in this population group,

Although an attempt was made to adjust for estrogen use, I think that further studies are needed to see if hormone replacement therapy has skewed the results of this study.

3b) The percentage of women using supplements almost doubled during the course of the study and the "supplement group" included both the women using supplements at the beginning of the study and the women who started supplement use during the study.

As the authors noted this raises the possibility that the supplemented group may have included a significant number of women who started using supplements because of medical conditions that arose during the study.

Ideally, the supplement using group and the non- supplement using group should both be disease free at the time supplement use was initiated if you are going to have a valid comparison.

4) The sample size was extremely small (108-530) for some of the groups where adverse effects were reported - especially copper, vitamin B6 and folic acid.

5) The study only reported supplement use versus non- use. It did not report the dosage of the individual supplements used by the women in the study. This is critical information, because both iron and copper are known to be toxic - and magnesium and zinc have the potential to be toxic - when used as stand-alone supplements at high doses.

6) This brings me to my most important critique. This study evaluated individual, probably high dose supplements. This is a concern because individual high dose supplements can cause harm by interfering with the absorption of similar nutrients from food or multivitamins.

As an example, this study reported that use of individual B6 or folic acid supplements were associated with a higher risk of mortality, but a B complex supplement containing B6 and folic acid (along with the other B vitamins) had no effect on mortality.

Next week in part two of this series I will discuss my "bottom line" recommendations for you based on an in- depth analysis of this study's results and other pertinent literature.

To Your Health! Dr. Stephen G Chaney