Can Vitamin D Prevent Prostate Cancer?
The Vitamin D Story
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What if something as simple as maintaining optimal vitamin D status could decrease your risk of prostate cancer? There is a lot of indirect evidence suggesting that vitamin D status might affect your risk of developing prostate cancer. For example:

* Prostate cancer incidence and vitamin D deficiency parallel each other. Both are highest in northern latitudes, in African American men, and in older men.
* Prostate cancer deaths are highest for patients diagnosed in the winter and at Northern latitudes.

However, clinical studies looking at the correlation between 25-hydroxy vitamin D (the biologically active form of vitamin D in the blood) and prostate cancer incidence have been inconsistent. Because of this there has been considerable controversy in the scientific community as to whether or not there was any correlation between vitamin D status and prostate cancer.

Can Vitamin D Prevent Prostate Cancer?

That's what makes the recent headlines suggesting that vitamin D is associated with decreased risk of aggressive prostate cancer so interesting. Have the conflicting data on vitamin D status and prostate cancer finally been resolved or is this just another case of dueling headlines? Let's start by looking at the study itself.

This study (Murphy et al, Clinical Cancer Research, 20: 2289-2299, 2014) enrolled 667 men, aged 40-79 (average age = 62), from five urology clinics in Chicago over a four year period. These were all men who were undergoing their first prostate biopsy because of elevated serum PSA levels or an abnormal DRE (that's doctor talk for digital rectal exam - the least favorite part of every guy's physical exam). The clinics also drew blood and measured each patient's 25-hydroxy vitamin D level at the time of the prostate biopsy.

This study had a number of important strengths:

* It was conducted at a northern latitude. Because of that 41.2% of the men in this study were vitamin D deficient (<20 ng/ml) and 15.7% were severely vitamin D deficient (<12 ng/ml). That's important because you need a significant percentage of patients with deficient vitamin D status to have any chance of seeing an effect of vitamin D status on prostate cancer risk.

* The study had equal numbers of African American and European American men. That's important because African American men have significantly lower 25-hydroxy vitamin D status and significantly higher risk of prostate cancer than European American men.

* All of the men enrolled in the study had elevated PSA levels or abnormal DREs. That's important because it meant that all of the men enrolled in the study were at high risk of having prostate cancer.

That made the correlation between vitamin D status and prostate cancer easier to detect.

* This was the first study to correlate 25-hydroxyvitamin D levels with prostate biopsies at the time of biopsy. That's important because it allowed the investigators to distinguish between aggressive tumors (which require immediate treatment and have a higher probability of mortality) and slow growing tumors (which may simply need to be monitored).

The results were pretty dramatic:

* In African American men vitamin D deficiency (<20 ng/ml) was associated with an increased risk of prostate cancer diagnosis at time of biopsy.

* In both European American and African American men severe vitamin D deficiency (<12 ng/ml) was associated with increased risk of aggressive prostate cancer diagnosis at time of biopsy.

The authors concluded: "Our work supports the hypothesis that 25-hydroxy vitamin D is a potential biomarker that plays a clinically significant role in prostate cancer, and it may be a useful modifiable risk factor in the disease".

That's "science speak" for "adequate vitamin D status may help prevent prostate cancer".

Why Have Some Studies Failed To Find A Correlation Between Vitamin D Status and Prostate Cancer?

The authors of the current study had an interesting hypothesis for why some previous studies have not seen an association between vitamin D status and prostate cancer risk. When you compare all of the previous studies, the strongest correlations between vitamin D status and prostate cancer were the studies conducted at northern latitudes, in African American men, or focusing on aggressive prostate cancer as an end point.

That offers a few clues as to why other studies may have failed to find a link between vitamin D status and prostate cancer risk. For example:

* The clue that the correlation between vitamin D status and prostate cancer risk was strongest at northern latitudes and with African American men suggests that you need to have a significant percentage of subjects with deficient or very deficient levels of 25-hydroxy vitamin D before you can see a correlation. Other studies may have failed to show a correlation simply because most of the men in the study had normal vitamin D status.

* The clue that the correlation is strongest for aggressive prostate cancer is more subtle. The authors hypothesized that prostate cancer develops over a lifetime. If that is the case, measuring vitamin D status at the time of diagnosis may not represent the lifetime vitamin D status. The vitamin D status could have decreased because the men were older or had become overweight, or the vitamin D

status could have changed simply because they moved from one geographical location to another.

In contrast, the progression from benign to aggressive prostate cancer is generally short term, so it would be affected by the most recent vitamin D status. If that is the case, then the vitamin D status measured at the time of diagnosis may more accurately reflect the vitamin D status that affected the aggressiveness of the cancer.

The Bottom Line

1) The latest study suggests that inadequate vitamin D status (<20 ng/ml serum 25-hydroxy vitamin D) may significantly increase the risk of prostate cancer. The correlation between low vitamin D status and prostate cancer risk is strongest for African American men.

2) The study also suggests that severe vitamin D deficiency (<12 ng/ml serum 25-hydroxyvitamin D) may significantly increase the risk of aggressive prostate cancer in both African American and European American men.

3) This is a very well done study, and it is consistent with many, but not all, of the previous studies. Clearly more research needs to be done. Future research should be focused on high risk subjects and subjects with low vitamin D status so that the correlation between vitamin D status and prostate cancer risk can be adequately tested.

4) This is another example of why I recommend that you have your serum 25-hydroxy vitamin D level measured on a regular basis and that you aim to keep it in the normal range (20-80 ng/ml). Some experts believe that 30-80 ng/ml is optimal.

5) If you are African American, overweight, live in northern latitudes or it is winter, you may need supplemental vitamin D3. 1,000 - 4,000 IU/day of vitamin D3 is generally considered to be safe. If higher amounts are needed to normalize your 25-hydroxy vitamin D levels I recommend that you consult your physician for the appropriate dose.

About The Author

Dr. Chaney has a BS in Chemistry from Duke University and a PhD in Biochemistry from UCLA. He is Professor Emeritus from the University of North Carolina where he taught biochemistry and nutrition to medical and dental students for 40 years. Dr. Chaney won numerous teaching awards at UNC, including the Academy of Educators "Excellence in Teaching Lifetime Achievement Award". Dr Chaney also ran an active cancer research program at UNC and published over 100 scientific articles and reviews in peer-reviewed scientific journals. In addition, he authored two chapters on nutrition in one of the leading biochemistry text books for medical students.

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