

# Too much calcium in blood may increase risk of fatal prostate cancer

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Men who have too much calcium in their bloodstreams may have an increased risk of fatal prostate cancer, according to a new analysis from Wake Forest University School of Medicine and the University of Wisconsin.

"We show that men in upper range of the normal distribution of serum calcium subsequently have an almost three-fold increased risk for fatal prostate cancer," said Gary G. Schwartz, Ph.D., associate professor of cancer biology and of epidemiology and prevention at Wake Forest, a part of Wake Forest University Baptist Medical Center. Such excess calcium can be lowered, he said.

The research appears in the September issue of *Cancer Epidemiology, Biomarkers & Prevention*, a journal of the American Association for Cancer Research.

Co-author Halcyon G. Skinner of the School of Medicine and Public Health at the University of Wisconsin stressed there is "little relationship between calcium in the diet and calcium in serum. So men needn't be concerned about reducing their ordinary dietary intakes of calcium."

Schwartz and Skinner analyzed the results of 2,814 men who participated in the National Health and Nutrition Examination Survey (NHANES-1). Measurement of the amount of calcium in the bloodstreams was determined an average of 9.9 years before prostate cancer was diagnosed.

The researchers focused on the 85 cases of prostate cancer and 25 prostate cancer deaths among the 2,814 men and divided the group into thirds, based on the serum calcium level. "Comparing men in the top third with men in the bottom third, we found a significantly increased hazard for fatal prostate cancer.

"To our knowledge, this is the first study to examine prostate cancer risk in relation to serum calcium," Schwartz and Skinner wrote. "These results support the hypothesis that high serum calcium, or a factor strongly associated with it, such as high serum parathyroid hormone, increases the risk for fatal prostate cancer."

In an interview, Schwartz said that if the relationship between serum calcium and prostate cancer "turns out to be causal, it suggests a means for potentially reducing the risk of fatal disease through medicines that reduce serum levels of calcium and/or parathyroid hormone."

He added, "Both calcium and parathyroid hormone are known to promote the growth of prostate cancer cells in the laboratory."

Skinner said, "The take-home message is that this may offer a simple means to detect men who are at increased risk of fatal prostate cancer."

Schwartz said serum calcium ordinarily is tightly regulated by parathyroid hormone, so there is little variation in an individual's serum calcium over time. "Calcium is basically the current that runs many of the functions of your body. Calcium is important for not only neuromuscular conduction, electrical conduction, but for the conduction of muscles in your heart."

Too little calcium in blood, less than 7 milligrams per deciliter, can cause uncontrolled muscular convulsions or contractions. Too much calcium, above 14 milligrams per deciliter, can cause a coma. "Your body

obviously cannot afford to oscillate between convulsions and coma, so the range of serum calcium is tightly controlled."

The upper third of NHANES-1 participants had high normal calcium levels, ranging from 9.9 to 10.5 milligrams per deciliter.

"If confirmed, our study shows that calcium at the high end of normal is associated with a three-fold increased risk of fatal prostate cancer later in life," Schwartz said. But unlike well-known risk factors for prostate cancer such as age, race or family history, which cannot be altered, "a man's serum calcium levels can be."

Several drugs already used in patients with high levels of parathyroid hormone, such as patients with chronic kidney disease, could be used to reduce calcium and/or parathyroid hormone in the blood, he said.

Measurements of serum calcium are routinely collected and are part of most medical visits. Thus, a physician can readily determine whether a man's serum calcium level is at the high end of normal.

"What is particularly exciting – if this study is replicated, and attempts to do so are already in progress – is that it suggests that a man may reduce his risk of fatal prostate cancer by lowering serum levels of calcium and/or parathyroid hormone," he said.

Source: Wake Forest University Baptist Medical Center

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