

Low vitamin D levels linked to increased risks after noncardiac surgery

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Patients with low blood levels of vitamin D are at increased risk of death and serious complications after noncardiac surgery, suggests a study in *Anesthesia & Analgesia*.

"Vitamin D concentrations were associated with a composite of in-hospital [death](#), serious infections, and serious [cardiovascular events](#)," according to the new research by Dr Alparslan Turan and colleagues of the Cleveland Clinic. They believe their results warrant further study to see if giving vitamin D supplementation before [surgery](#) can reduce the risk of these adverse outcomes.

Lower Vitamin D Levels Linked to Higher Surgical Risk

The researchers analyzed the relationship between vitamin D level and surgical outcomes in approximately 3,500 patients who underwent operations other than heart surgery between 2005 and 2011. Only patients who had available data on vitamin D levels around the time of surgery—from three months before to one month afterward—were included in the study.

The concentration of vitamin D (specifically, 25-hydroxyvitamin D) in blood samples was analyzed as a risk factor for death, cardiovascular events, or serious infections while in the hospital. The analysis included adjustment for other factors such as demographic characteristics,

medical conditions, and type and duration of surgery.

Most patients did not meet the recommended 25-hydroxyvitamin D concentration of greater than 30 nanograms per milliliter (ng/mL). The median vitamin D level was 23.5 ng/mL—more than 60 percent of patients were in the range of vitamin D insufficiency (10 to 30 ng/mL). Nearly 20 percent had vitamin D deficiency (less than 10 ng/mL).

"Higher vitamin D concentrations were associated with decreased odds of in-hospital mortality/morbidity," the researchers write. For each 5 ng/mL increase in 25-hydroxyvitamin D level, the combined risk of death, cardiovascular events, or serious infections decreased by seven percent.

Patients at the lowest level of 25-hydroxyvitamin D (less than 13 ng/mL) were at highest risk of death or serious complications. Those with higher vitamin D levels (up to 44 ng/mL) had about half the risk as those in the lowest group. The association with low vitamin D was statistically significant only for cardiovascular complications, although there were "strong trends" for mortality and infections.

Further Study Needed to Determine Cause and Effect

"Vitamin D deficiency is a global health problem," according to Dr Turan and coauthors. In addition to protective cardiovascular and neurological effects, vitamin D plays an important role in the immune system.

The high rates of vitamin D insufficiency and deficiency in the surgical patients studied are consistent with previous findings in the general population. In recent years, studies have suggested that vitamin D levels may affect a wide range of health outcomes.

Patients undergoing surgery are at risk of cardiovascular and infectious complications, both of which may be aggravated by vitamin D deficiency. Previous studies found no increased risk of adverse outcomes related to vitamin D levels in patients undergoing cardiac surgery. It may be that the tissue injury and inflammation associated with heart surgery overwhelms any potential protective effect of vitamin D.

However, Dr Turan and colleagues note that their study had some important limitations of their study—especially the fact that it included only [patients](#) who had recent measurements of vitamin D levels. They may represent a less-healthy group, introducing a potential source of selection bias.

The study can't determine whether there is any cause-and-effect relationship between vitamin D levels and the risk of adverse outcomes. Dr Turan and colleagues suggest a formal randomized trial to evaluate whether preoperative [vitamin D](#) supplementation can reduce the risk of serious [complications](#) and death after surgery.

More information: *Anesthesia & Analgesia*.
journals.lww.com/anesthesia-analgesia/abstract/2014/08000/00000.98423.aspx

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