

# Low vitamin D causes problems for acutely ill patients

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A group of endocrinologists in Sydney have observed that very sick patients tend to have very low levels of Vitamin D. The sicker they are, the lower the levels.

Dr Paul Lee, Professor John Eisman and Associate Professor Jackie Center, researchers at Sydney's Garvan Institute of Medical Research, examined a cohort of 42 Intensive Care Unit (ICU) patients. Forty-five percent turned out to be Vitamin D deficient.

These findings will be published as a letter in the April 30, 2009 issue of the *New England Journal of Medicine*.

"Until now, the medical community has thought of Vitamin D deficiency as a chronic condition," said Dr Lee. "Little is known about its acute complications."

"Last year, we published several cases showing that Vitamin D deficiency can cause acute complications in the intensive care unit."

"Recently, Vitamin D has been recognised for its many roles beyond the musculoskeletal system. It has been implicated in diabetes, in the immune system, in cancers, in heart disease and in [metabolic syndrome](#)."

"Vitamin D appears to have roles in controlling sugar, calcium, [heart function](#), gut integrity, immunity and defence against infection. Patients in ICU suffer from different degrees of inflammation, infection, heart

dysfunction, diarrhoea and metabolic dysregulation - so vitamin D deficiency may play a role in each of these common ICU conditions."

"So we did a preliminary study and found that 45% of people in our ICU were Vitamin D deficient. There may be a bias, in that all patients were referred to endocrinology, so the numbers may not reflect the prevalence in a standard ICU cohort. However 45% is still a significant proportion.

When the team correlated the Vitamin D levels with a [disease severity](#) score, there was a direct correspondence between sickness and Vitamin D deficiency. In other words, the sicker someone was, the lower the levels of Vitamin D. Out of the 42 patients studied, there were 3 deaths. The 3 patients who died all had the lowest level of Vitamin D in the cohort.

"Perhaps when we are well, we have ways to compensate for organ dysfunction if we run low on Vitamin D," said Lee.

"But when we are very sick, the "sick organs" draw upon any vitamin D available to function properly, therefore we may need extra Vitamin D to maintain organ function during critical illness. However, at this stage, we don't know whether Vitamin D deficiency is just a marker of ill health, or whether it contributes to disease severity."

Lee believes that the study, while preliminary, is important because it highlights the fact that Vitamin D deficiency is common in intensive care units and is associated with disease severity.

The next step will be a randomised control study to investigate whether Vitamin D has benefits in critically ill patients. In simple terms, two groups of patients (who are evenly matched) will be treated, with Vitamin D added to the treatment of one group, but not the other. The outcomes will then be compared.

So should doctors be trying to raise the Vitamin D levels of their patients in the meantime?

Dr Lee hopes the randomised study may provide a more definitive answer to the question. "However, Vitamin D is very safe. It's inexpensive and has a very large safety window, making toxicity unlikely, unless there are underlying diseases causing high calcium. Giving vitamin D to severely deficient patients is very unlikely to cause harm. In addition, ICU patients are lying in bed for a long time, and are at risk of bone loss and osteoporosis. So if nothing else, [Vitamin D](#) will help protect their bones."

Source: Research Australia ([news](#) : [web](#))

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