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Cystic Fibrosis Research News

Title:

Vitamin D supplementation in patients with cystic fibrosis: A systematic review and meta-analysis.

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What was your research question?

Our question was whether increasing the dose of vitamin D supplementation improves the health of people with cystic fibrosis (CF), our main interests being: risk of death, bone health, lung function and infections. We also wished to evaluate whether a higher dose was accompanied by a higher rate of side effects (adverse events).

Why is this important?

In CF, defective CFTR channels lead to thickened secretion production and obstruction in pancreatic and biliary ducts, resulting in chronic inflammation of the pancreas (pancreatitis) and not enough production of pancreatic enzymes (exocrine insufficiency). This will in turn, result in worse absorption of fat and low levels of fat-soluble vitamins, including vitamin D. Vitamin D is not only necessary for optimal bone health, it also affects the immune system, with sufficient levels aiding the prevention of infections. This makes it a prime candidate for evaluation: whether it can reduce the number of pulmonary flare ups (exacerbations), delay disease progression and decrease the number of deaths.

What did you do?

Ours is the first meta-analysis (statistical combination of studies) using only randomized controlled trials (RCTs), which are the best for answering therapeutical questions. These studies compared vitamin D supplementation to placebo or no vitamin D. Since each applied basal vitamin D, the comparison that we had the chance to observe was a lower versus a

higher dose. We also reviewed current recommendations regarding vitamin D supplementation in CF, and put it in the context of our results.

What did you find?

Eight RCTs were included in our review. While a higher dose raised serum vitamin D concentration, we found no significant differences in our observed outcomes and no higher rate of adverse events. Participants received around 400-1,800 IU/day vitamin D – mirroring current recommendations –, the intervention group received an additional 1,600-5,000 IU/day. To our surprise, we noted too low vitamin D levels at baseline. It should also be pointed out, that outcomes of the individual RCTs rarely overlapped and that patient numbers were low. Some key patient-important outcomes, such as long-term survival and data regarding exacerbations, were not collected by the studies.

What does this mean and reasons for caution?

Too low levels of vitamin D at baseline suggests that generally a higher initial dose should be considered, since CF is a high risk population and increasing supplementation did not increase adverse events. Clinicians should monitor vitamin D status and be on the lookout for too low levels as it is common. Our current results suggest that an increased vitamin D dose does not influence clinical outcomes, however, it should not be considered definite ineffectiveness, the quality of evidence being very low – due to the low number of participants and the large variety in choice of reported outcomes resulting, in most cases, less than 100 participants per comparison.

What's next?

While novelty is important, we strongly encourage researchers to include outcomes of past studies as well – in a condition like CF, this is the only way to gather high quality evidence. RCTs with longer follow-up periods (5 years or more) should also be conducted to observe long-term effects of supplementation.

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