Too much vitamin A may increase risk of bone fractures

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Retinol or Vitamin A 3D space model (balls model). Credit: YassineMrabet, Wikipedia.

Consuming too much vitamin A may decrease bone thickness, leading to weak and fracture prone bones, according to a study published in the *Journal of Endocrinology*. The study, undertaken in mice, found that sustained intake of vitamin A, at levels equivalent to 4.5-13 times the human recommended daily allowance (RDA), caused significant weakening of the bones, and suggests that people should be cautious of over-supplementing vitamin A in their diets.

Vitamin A is an essential vitamin that is important for numerous biological processes including growth, vision, immunity and organ function. Our bodies are unable to make vitamin A but a healthy diet including meat, dairy products and vegetables should be sufficient to maintain the body's nutritional needs. Some evidence has suggested that people who take vitamin A supplements may be increasing their risk of bone damage. Previous studies in mice have shown that short-term overdosing of vitamin A, at the equivalent of 13-142 times the recommended daily allowance in people, results in decreased bone thickness and an increased fracture risk after just 1-2 weeks. This study is the first to examine the effects of lower vitamin A doses that are more equivalent to those consumed by people taking supplements, over longer time-periods.

In this study, Dr. Ulf Lerner and colleagues from Sahlgrenska Academy at the University of Gothenburg, report that mice given lower doses of vitamin A, equivalent to 4.5-13 times the RDA in humans, over a longer time period, also showed thinning of their bones after just 8 days, which progressed over the ten week study period.

Dr. Ulf Lerner commented, "Previous studies in rodents have shown that vitamin A decreases bone thickness but these studies were performed with very high doses of vitamin A, over a short period of time. In our study we have shown that much lower concentrations of vitamin A, a range more relevant for humans, still decreases rodent bone thickness and strength."

Next, Dr. Ulf Lerner intends to investigate if human-relevant doses of vitamin A affect bone growth induced by exercise, which was not addressed in this study. Additionally, his team will study the effects of vitamin A supplementation in older mice, where growth of the skeleton has ceased, as is seen in the elderly.

Dr. Ulf Lerner cautions: "Overconsumption of vitamin A may be an increasing problem as many more people now take vitamin supplements. Overdose of vitamin A could be increasing the risk of bone weakening disorders in humans but more studies are needed to investigate this. In the majority of cases, a balanced diet is perfectly sufficient to maintain the body's nutritional needs for vitamin A."

More information: The study "Clinically relevant doses of vitamin A decrease cortical bone mass in mice" will be published in the *Journal of Endocrinology* on Tuesday 09 October 2018.

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