

# Clinical causes of PTH-independent hypercalcemia in children include hypervitaminosis.

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## Introduction

Although hypercalcemia is less common in children than in adults, it is more likely to be clinically significant. Although the differential diagnosis of hypercalcemia in children and adults is similar, the frequency with which they occur differs significantly. As a result, congenital reasons are more common in children than acquired causes like cancer, which are more common in adults. The causes of hypercalcemia differ depending on the child's age, with congenital defects being more common in new-borns and teenagers being impacted by adult-like illnesses. It can be difficult to determine the causes of hypercalcemia in children; this article discusses these factors and proposes a clinical protocol to help with diagnosis [1].

## PTH-independent hypercalcemia

Hypervitaminosis D and A, drugs, malignancies, granulomatous disorders, endocrinopathies, renal tubular disorders, chronic inflammatory disorders, infections, immobilisation, congenital syndromes, and inborn errors of metabolism are all examples of PTH-independent hypercalcemia, which is more common in children than PTH-dependent hypercalcemia. The next sections go over several illnesses, some of which may be linked to high plasma concentrations of 25(OH)D<sub>3</sub> or 1,25(OH)<sub>2</sub>D<sub>3</sub> concentrations [2].

## Hypervitaminosis

Vitamins are widely available and can be found in a range of formulations and retail channels. Vitamins are occasionally added to foods by the food industry. Vitamins can be taken in excess, and hypervitaminosis can cause issues, albeit it is unusual. Antioxidant supplements, such as vitamin A and vitamin E, have been found in studies to have no protective effects and may even be hazardous to our health, especially in well-nourished people. Our cuisine appears to be the best source of antioxidants, rather than antioxidant supplementation in pills or tablets. Supplementing with vitamins A and E may actually increase mortality [3].

Vitamin D<sub>3</sub>, on the other hand, appears to lower mortality in elderly adults who live freely or in institutions. In the general population, vitamin C supplementation has not been proved to lessen the incidence of colds. Vitamin C supplementation has been demonstrated to shorten the duration of colds in clinical trials, but this has not been repeated in therapeutic trials.

## Hypervitaminosis A

Vitamin A is found in dietary sources such as liver, kidney, and milk as fatty-acid esters, as well as in plants as provitamin A carotenoids, most commonly as beta-carotene. Hypercarotenemia (abnormally high levels of beta-carotene in the body) causes the skin to turn yellow, but not the eyes (in contrast to jaundice where the sclera are also yellow). Vitamin A is stored in excess in the body, primarily in the liver. Large levels of beta-carotene and other provitamin A carotenoids are not associated with serious deleterious consequences, despite the fact that excess preformed vitamin A can be hazardous [4]. The characteristics of hypervitaminosis A are determined by the size and duration of the excess consumption. Acute toxicity is caused by hypervitaminosis A, which occurs when a large amount of vitamin A is consumed in a short period of time. Increased intracranial pressure (pseudotumour cerebri), dizziness, nausea, headaches, skin irritation, joint and bone pain, coma, and even death are among symptoms of too much vitamin A. Although large food intakes can cause hypervitaminosis A, the disorder is most commonly caused by eating too much preformed vitamin A through supplements or therapeutic retinoids. After stopping supplements, tissue levels may take a long time to drop, and the subsequent liver damage is not always reversible.

Excessive use of preformed vitamin A and various topical synthetic retinoids (e.g., isotretinoin and tretinoin) can result in congenital birth problems, such as eye, skull, lung, and heart deformities. Vitamin A supplements should not be taken in large dosages by women who may be pregnant. Beta-carotene, unlike preformed vitamin A, is not known to be teratogenic. Even high doses of beta-carotene supplements or long-term diets rich in carotenoid-rich foods have not been linked to toxicity. Carotenoderma, a harmless disorder in which the skin turns yellow-orange and may be reversed by halting beta-carotene ingestion, is the most important impact of long-term, excessive beta-carotene. However, using beta-carotene supplements for 5-8 years, with or without retinyl palmitate, has been linked to an increased risk of lung cancer and cardiovascular disease among current and former smokers, as well as males who have worked with asbestos. Pregnant women should not consume more than 600 mcg of iron per day. Vitamin A in high quantities might cause teratogenic effects. Vitamin supplement toxicity has been documented in youngsters [5].

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