Vitamin D levels examined for long-term health effects

5 November 2014, by Lily Yeang

"The active form of vitamin D, 1,25(OH)2D, stimulates absorption of calcium from the gastrointestinal tract and reabsorption of calcium from the kidneys into the circulation, which is used to form bone," she says.Image: Ella Alfon

A West Australian study has recorded the vitamin D levels of local children, along with the genes involved in its production, setting the foundation for future research into vitamin D effects on a person's health from childhood to adulthood.

The research, the first of its kind in WA, uses data from the West Australian Pregnancy Cohort or Raine Study and examines the prevalence of vitamin D influencing genes in children.

The Telethon Kids Institute study found two main genes that had been shown to regulate vitamin D levels in other adult populations, CYP2R1 and GC, were also associated with vitamin D levels at both age six and age 14 in the Raine cohort.

"Both of these genes are involved in the production of the active form of vitamin D," co-author and Telethon Kids Institute Genetics and Health head, Professor Jenefer Blackwell says.

"In addition, we identified a novel association at NPY which was only apparent in the age six samples."

Prof Blackwell says the gene NPY might influence vitamin D levels through its role in suppressing bone formation.

"The active form of vitamin D, 1,25(OH)2D, stimulates absorption of calcium from the gastrointestinal tract and reabsorption of calcium from the kidneys into the circulation, which is used to form bone," she says.

Sex hormones dominate adolescent bone development

"If NPY suppresses bone formation, then there would presumably be less demand for circulating calcium, which could lead to suppression of 1,25(OH)2D.

"We believe that we did not see this association at age 14 because the sex hormones exert a greater influence on bone."

Prof Blackwell says it is important to understand whether different metabolic processes are in place to regulate vitamin D in children compared to adults.

"The interventions we might choose to use to regulate vitamin D levels in adults might not work in children, and vice versa," she says.

"Because vitamin D deficiency is a risk factor for many conditions, including rickets in children and osteomalacia in adults—as well as cancer, cardiovascular disease, influenza type A, rheumatoid arthritis, and both type 1 and type 2 diabetes—it is very important for us to understand how the body acquires and metabolises vitamin D.

"Genetic studies can help to uncover the molecules

and processes that are involved in vitamin D metabolism, and why different individuals may deal with vitamin D differently."

More information: "Genome-wide association study of vitamin D levels in children: replication in the Western Australian Pregnancy Cohort (Raine) study." *Genes Immun*. 2014 Sep 11. DOI: 10.1038/gene.2014.52. [Epub ahead of print]

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