



The Connection Between PCOS & Vitamin D

It has been speculated that the majority of individuals in the U.S. are deficient in Vitamin D and that Vitamin D deficiency has become an epidemic in our country. A deficiency of Vitamin D not only causes poor bone mineralization but also has been implicated in numerous chronic diseases including diabetes, heart disease, immunity, various cancers, multiple sclerosis, rheumatoid arthritis, and hypertension.

PCOS & Vitamin D

Vitamin D receptors have now been identified in almost every tissue and cell in the human body and the Vitamin has been found to be involved in follicle egg maturation and development. In fact, in a small trial study of 13 women with PCOS who were deficient in Vitamin D, normal menstrual cycles resumed within 2 months in 7 of the 9 women who had irregular menstrual cycles when given Vitamin D repletion with calcium therapy (1). Two women even established pregnancies. The authors of the study suggest that abnormalities in calcium balance may be responsible, in part, for the arrested follicular development in women with PCOS and may even contribute to the pathogenesis of the syndrome (1). Vitamin D also plays a key role in glucose regulation, notably in decreasing insulin resistance. Low levels of vitamin D have been negatively correlated with the incidence of type 1 and 2 diabetes.

Are you getting enough Vitamin D?

Many researchers believe the current amount for Vitamin D is set too low at 400 International Units (IU) daily and should be increased. The tolerable upper limit (UL) for Vitamin D is 2,000 IU per day, however, no adverse affects have been found up to 10,000 IU per day. Few foods contain Vitamin D other than milk fortified with Vitamin D, eggs, liver, cereals with vitamin D added, and fatty fish. However, skin exposure to the sun provides as much as 80 to 90% of the body's vitamin D.

The elderly and dark skinned people may be at risk for a Vitamin D deficiency as melanin blocks the conversion of active Vitamin D in the skin. Overweight individuals as the majority of PCOS women are, have a greater chance of being deficient in Vitamin D because it is a fat-soluble vitamin and may not be as

bioavailable in high amounts of fat tissue. In fact, obese people may have as much as a 57% reduction in serum Vitamin D levels than thin individuals as bioavailability is reduced both by skin synthesis and gastrointestinal absorption. Blood levels of Vitamin D can be measured by checking 25 dihydroxy vitamin D levels and should be a part of an annual physical examination for all individuals.

Food sources of Vitamin D

The following are some food sources of Vitamin D. Again, you should be getting *at least* 400 IU per day. If you find you are not consuming enough Vitamin D consider taking a Vitamin D supplement and be sure to have your doctor check your Vitamin D blood levels.

<u>Food</u>	<u>International Units (IU) Per Serving</u>
Cod liver oil, 1 Tablespoon	1,360
Salmon, 3.5 ounces	360
Tuna fish, canned, 3 ounces	200
Milk, fortified (any type), 8 ounces	98
Cereals, fortified with 10% DV of Vitamin D	40
Egg, 1 whole	20
Cheese, 1 ounce	12

Resources

1. Thys-Jacobs S, Donovan D, Papadopoulos A, Sarrel P, Bilezikian JP. Vitamin D and calcium dysregulation in the polycystic ovarian syndrome. *Steroids* 1999 Jun;64(6):430-5.
2. Grassi A. *The PCOS Workbook: Your Guide to Complete Physical and Emotional Health*. Luca Publishing, 2009.