

Obesity plus low vitamin D may add up to a greater risk of diabetes

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The combination of obesity and vitamin D deficiency may put people at even greater risk of insulin resistance than either factor alone, according to new research from the Drexel University School of Public Health recently published early online in the journal *Diabetes Care*. Insulin resistance is a major risk factor for Type 2 diabetes, a condition that affects 25.6 million adults and is the seventh leading cause of death in the United States.

"Vitamin D insufficiency and obesity are individual risk factors for insulin resistance and diabetes," said lead author Shaum Kabadi, a [doctoral candidate](#) in epidemiology at Drexel. "Our results suggest that the combination of these two factors increases the odds of insulin resistance to an even greater degree than would have been expected based on their individual contributions."

In the study, obese individuals who had healthy levels of vitamin D had insulin resistance almost 20 times more often than the overall study population. But in obese individuals whose serum vitamin D was low, insulin resistance was much higher: about 32 times more common than the average.

Senior author Dr. Longjian Liu, an associate professor in the School of Public Health, noted, "It's not clear whether obesity itself causes a low vitamin D level or if it's the other way around."

Vitamin D is stored in adipose fat tissues, making it unavailable for the

body to use; as a result, people who are overweight are already more likely to have low levels of serum vitamin D. [Vitamin D deficiency](#) is associated with multiple health conditions including diabetes, cardiovascular diseases including stroke, depression, dementia and other conditions.

Kabadi, Liu and co-author Dr. Brian Lee, an assistant professor in the School of Public Health, analyzed data on serum vitamin D levels and indicators of insulin resistance and diabetes from 5,806 respondents to a major national health survey, the National Health and [Nutrition Examination Survey](#) (NHANES). This was the first study of the association between vitamin D and diabetes risk for obese patients using a large, nationally representative sample of adults. The survey reported data from individuals at a single point in time and was therefore unable to determine whether there is a cause-and-effect relationship among vitamin D, obesity and insulin resistance.

Further studies could indicate whether vitamin D supplements are effective at reducing the risk of insulin resistance and diabetes in obese individuals. If so, the authors noted that it would be an inexpensive and practical prevention strategy compared to the difficulty involved in healthy weight loss.

Liu said that vitamin D supplements may be useful for people who are overweight or obese to help control diabetes, but he cautioned that too much vitamin D can cause side effects such as weakness and fatigue. In addition, [vitamin D](#) deficiency is just one of many known [risk factors](#) associated with [insulin resistance](#) and diabetes. "Therefore, to control diabetes, we need to have comprehensive prevention strategies. For example, physical activity may be the most cost-effective way to control weight and subsequently to control conditions including diabetes and heart disease," Liu said.

More information: [dx.doi.org/10.2337/dc12-0235](https://doi.org/10.2337/dc12-0235)

Provided by Drexel University

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