

Insulin resistance linked to weaker bones

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Reduced effectiveness of the hormone insulin, or insulin resistance, is associated with weakened bones, a clinical study shows. The results were presented Sunday at The Endocrine Society's 95th Annual Meeting in San Francisco.

In the United States, the incidence of diabetes is quickly mounting. Between the years of 1980 and 2011, the number of cases diagnosed jumped from about 6 million to nearly 21 million, according to statistics from the [Centers for Disease Control and Prevention](#).

[Type 2 diabetes](#) is the result of [insulin resistance](#), which causes cells to react improperly to the insulin that is secreted. Normally, insulin helps regulate sugar, or glucose, concentrations in the blood. With insulin resistance, the pancreas produces increased amounts of the hormone to compensate. This leads to abnormally high levels of insulin in the blood, or [hyperinsulinemia](#).

In turn, hyperinsulinemia increases the risk of other diseases. Left unchecked, it can cause high blood pressure, obesity and other serious complications. Together, these conditions are known as metabolic syndrome, which greatly increases the risk of heart disease and stroke.

In addition, type 2 diabetes is linked to a greater risk of bone fractures, even though bone-mineral density often is higher among diabetics, compared to non-diabetics. To assess the effects of insulin resistance on [bone strength](#), researchers correlated bone strength relative to load with the level of insulin resistance.

They found that bone strength decreased by 10 to 14 percent every time insulin resistance doubled. This decrease in bone strength corresponded to high [insulin levels](#) in the blood, rather than high blood-sugar concentrations.

"This finding could have significant public health implications for the bone health of a large number of obese individuals, both those with and those

without type 2 diabetes," said the study's lead author Preethi Srikanthan, MD, associate clinical professor at the University of California, Los Angeles. "Being obese not only increases your risk of being diabetic, but it also increases your risk for fragile bones."

Researchers assessed bone strength with a special X-ray test that measures bone-mineral density. They combined bone density with bone size and body height and weight to estimate bone strength relative to load. They then analyzed insulin resistance by measuring levels of sugar and insulin in blood samples, and correlated these data with the bone strength data, adjusted for age, sex, race and, for women, menopause transition status.

They obtained study data from 717 participants in a nationwide project called the Biomarker Project of the Midlife in the United States Study.

Provided by The Endocrine Society

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