

Higher risk of fracture in type 1 diabetes may be linked to poor blood sugar control

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Patients with type 1 diabetes and poor blood sugar control face a higher risk of fragility fracture—any fall from standing height or less that results in a broken bone—than type 1 diabetes patients with good blood sugar control, according to a study published in the Endocrine Society's *Journal of Clinical Endocrinology & Metabolism*.

Diabetes affects an estimated 30 million Americans. Type 2 diabetes is the most common form of the disease and occurs when patients are resistant to insulin. Type 1 diabetes, diagnosed mostly in children and adolescents, is due to an insulin deficiency. People with type 1 diabetes must take insulin every day, while those with type 2 can mostly be treated with diet, exercise and oral diabetes medications.

Good blood sugar control is an important goal for patients with diabetes. Clinicians typically measure a patient's glycemic control with the hemoglobin A1c test. The test both diagnoses diabetes and measures a patient's average blood sugar levels over a two- to three-month period. Patients run the risk of complications when blood sugar remains too high over time or falls too low.

"We investigated the association between the degree of glycemic control and fracture risk by using a large cohort of newly diagnosed type 1 and type 2 [diabetes patients](#)," said one of the study's authors, Janina Vavanikunnel, M.D., of the University Hospital Basel in Basel, Switzerland. "Both types of diabetes are associated with fragility [fractures](#) and we showed that poor glycemic control is associated with an

increased risk of fracture in type 1 diabetes."

Data from a U.K.-based primary care database was used to design a nested case-control study within a cohort of 3,329 patients with type 1 diabetes and 44,275 patients with type 2 diabetes. Researchers found that both diseases are associated with fragility fractures. This study is unique because it examined a much larger patient population than past research and examined a three-year average of A1c values. On average, nine A1c measurements for the patients with type 1 diabetes and 11 measurements for patients with type 2 diabetes were recorded.

This study shows that poor glycemic control with an A1c level above eight percent is associated with an increased risk of fractures in patients with type 1 but not type 2 diabetes, at least in short-term disease. According to this study, the risk of fracture in [patients](#) with type 2 diabetes is likely due to factors beyond glycemic control, like other diabetes-related comorbidities.

"Nevertheless, [fracture risk](#) in type 2 [diabetes](#) is of clinical relevance as well as it is a major health concern worldwide due to its high prevalence," said the study's other author, Sarah Charlier, M.Sc., of University Hospital Basel.

Other authors of the study include: Claudia Becker, and Cornelia Schneider of University Hospital Basel and University of Basel in Basel, Switzerland; Susan S. Jick of the Boston Collaborative Drug Surveillance Program and Boston University School of Medicine in Lexington, Mass.; Christoph R. Meier of University Hospital Basel, University of Basel and the Boston Collaborative Drug Surveillance Program; and Christian Meier of University Hospital Basel.

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The study, "Association Between Glycemic Control and Risk of Fracture in Diabetic Patients: A Nested Case-Control Study," will be published online, ahead of print.

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