Bone Fractures and Hypoglycemic Treatment in Type 2 Diabetic Patients

Reference:

Scientific Literature Review

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Podiatric Relevance:
Acute trauma and chronic stress are two common etiologies leading to lower extremity fracture. The development of this pathology may be influenced by oral hypoglycemic medication and/or insulin. This study provides useful data on the effect of oral hypoglycemic agents and insulin on the incidence of bone fractures.

Methods:
1945 diabetic outpatients were followed in a case-control study within a retrospective cohort. The study was conducted between 1998-2005 with an average follow-up of 4.1 ± 2.3 years. Comparison studies were performed between 83 cases of bone fracture and 249 control subjects based on age, sex, duration of diabetes, BMI, comorbidity, alcohol use, tobacco use, and HbA1c. Oral hypoglycemic agents, including insulin use within 10 years, was documented.

Results:
Of the observed fractures, 46/83 (55%) were of the lower limbs. In a model including treatment with insulin secretagogues, metformin and insulin for at least 36 months during the previous 10 years, no significant association was observed between bone fractures and the use of these medications. In an alternative model considering treatments at the time of fracture, insulin treatment was significantly associated with bone fractures in men, but not in women. It is noted that men demonstrate a lower incidence of spontaneous fracture due to osteoporosis compared to women.

Conclusions:
On the basis of these findings, metformin (insulin sensitizing treatment) was not associated with a high bone fracture incidence. It is suggested that the negative effects of thiazolidinediones are due to a specific action on bone metabolism, and not due to a reduction not due to a reduction of insulinemia. Conversely, current treatment with insulin at the index date showed a significant association with bone fractures. This is consistent with the hypothesis that insulin could increase fracture risks via falls attributed to episodes of hypoglycemia. However, exposure to insulin in the longer term does not appear to affect bone frailty, particularly in older patients with type 2 diabetes.