

Altered Bone Metabolic Markers In Type 2 Diabetes Mellitus: Impact of Glycemic Control

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Abstract

Objective

To study the influence of glycemic control on bone minerals and biochemical markers of bone metabolism in patients with type 2 diabetes mellitus.

Methods

A Case-control study was conducted at Uhod Hospital, KSA from October 2003 to August 2004 to study 60 premenopausal, multiparous female patients with type 2 diabetes mellitus for >5 years, under oral anti-diabetics, with no diabetic complications. They were divided according to their glycemic control into: controlled group (n=22) and poorly controlled group (n=38) and were compared to 30 age matched healthy women. Osteocalcin (OC), urinary deoxypyridinoline (Dpd), Parathyroid hormone (PTH) were measured by chemiluminescent enzyme immunometric assay and 25 hydroxy vitamin D (25 OH-D) was measured by high performance liquid chromatography.

Results

In both diabetic groups, there were higher ALP (177 ± 39.88 & 287 ± 41.4 mg/dl) and PTH (49 ± 9.87 & 56.25 ± 12.3 Pg/ml) than in controls (144 ± 22.54 mg/dl, 26.9 ± 5.60 Pg/ml respectively), but lower serum calcium (8.87 ± 0.3 & 8.79 ± 0.7 mg/dl), and 25 OH-D (50.9 ± 12.6 , 45.4 ± 18.9 µg/l) and osteocalcin (4.09 ± 1.48 & 1.89 ± 0.24 ng/ml) than controls (9.96 ± 1.91 , 57.9 ± 13.6 µg/l, 6.5 ± 1.5 ng/ml respectively), Urinary calcium and urinary Dpd were higher (270.66 ± 41.7 & 300.56 ± 55.67 mg/d & 10.8 ± 4.6 , 12.06 ± 5.12 nM/mM creatinine) than in controls (244.23 ± 51.5 mg/d, 6.2 ± 0.8 nM/mM creatinine). Glycemic indices (FBG, HbA_{1C}) showed significant positive correlation with ALP ($r=0.290$ & 0.294), urinary calcium ($r=0.340$ & 0.260) and Dpd ($r=0.468$ & 0.228).

Conclusion

Our data give evidence of altered bone metabolic markers in both controlled and uncontrolled female patients with type 2 diabetes mellitus with more significant alterations in the uncontrolled group. This could reflect the strong impact of glycemic control on diabetic bone turnover.

Keywords: Calcium, Diabetes mellitus, Parathormone

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