

## **Abstract: for AGS 2016**

**Title:** Bone turnover does not reflect skeletal aging in older Hispanic men with type 2 diabetes

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The paradox of fragility fracture in the presence of non-osteoporotic bone mineral density in older patients with type 2 diabetes mellitus (DM2) makes it difficult to clinically predict fracture in this vulnerable group. Serum osteocalcin (OC), a marker of bone turnover, increases with normal skeletal aging indicating risk of fracture. However, OC has been reported to be lower in patients with DM2. An inverse association between higher glycated hemoglobin levels (HbA1c) and lower serum OC in older DM2 patients triggered discussions encouraging further investigation. A key question to be answered is whether changes in glucose metabolism is responsible for bone metabolic changes, ultimately leading to increased risk of fragility fractures in DM2 patients. While these studies were conducted among Caucasian and Asian populations, this has not been studied in Hispanic populations who suffer from a higher prevalence of DM2. The Cameron County Hispanic Cohort (CCHC) in Texas is a homogeneous Hispanic cohort known to have high prevalence of DM2 (30%). Our preliminary data from this cohort reported OC levels lower than the suggested threshold for fragility fracture in post-menopausal women. We further investigated whether bone turnover in older CCHC adults with DM2 show a normal pattern of skeletal aging.

Samples and data were obtained from a nested cohort of 68 (21 men and 47 women) Hispanic older adults ( $\geq 50$  years) who had a diagnosis of DM2. Given high prevalence of uncontrolled DM2 in this cohort, we divided population into two groups: i) poor DM2 control with HbA1c level  $\geq 8$  (48% men and 38% women) and ii) good DM2 control with HbA1c level  $< 8$ . A cross-sectional analysis documented associations between serum OC and age adjusted HbA1c levels.

There was no direct association between age and OC concentrations in our study. Higher HbA1c was associated with lower serum OC in men (odds ratio -6.5, 95% confidence interval -12.7 to -0.3,  $p < 0.04$ ). No significant associations were identified in women.

Bone turnover in older Hispanic men with DM2 in our study does not reflect normal pattern of skeletal aging. It is unclear why similar results were not identified in women. We will continue to follow this cohort to investigate longitudinal trend of changes of bone turnover and its relationship with HbA1c in both men and women of this cohort.