

#0067

The Relationship Between Hypertension and Thoracic Spine Bone Mineral Density: The Multi-Ethnic Study of Atherosclerosis (MESA)

Author/s: Ahmed K Ghanem, MD¹; Venkat S. Manubolu, MD, MPH¹; April Kinninger, MPH¹; Robyn L. McClelland, PhD²; Jaewon Lim MS²; Denise Javier, MD¹; Khadije.Ahmad, MD¹; Hossein Hamidi, MD¹; Marziyeh Bagheri, MD¹; Mina Deljavanghodrati, MD¹; Matthew J Budoff MD¹.

Organizations/Affiliations:

- 1- Lundquist Institute, Harbor-UCLA Medical Center, Torrance, CA
- 2- Department of Biostatistics, University of Washington, Seattle, WA

Abstract

Background: Hypertension (HTN) and osteoporosis, assessed by bone mineral density (BMD), were considered unrelated. It is now recognized that vascular inflammation and immune cell activation are involved in the pathophysiology of both conditions. Yet, the precise interconnection between HTN and BMD remains inadequately understood.

Methods: MESA study participants without and with hypertension (defined as blood pressure (BP) ≥ 140 mmHg (and/or) ≥ 90 mmHg (and/or) using antihypertensive medication), thoracic spine BMD was measured via non-contrast chest computed tomography, following methods by Budoff et al. (2017). Linear regression assessed BMD's relationship with BP as a continuous variable. Categorizing BMD by T-scores (normal, osteopenia, osteoporosis), proportional odds logistic regression was applied. Adjusted multivariable regression models considered age, gender, race/ethnicity, BMI, and osteoporosis medications to evaluate these associations.

Results:

6,804 participants were included with a mean age of 62.2 ± 10.2 years, 47% men, 38% Caucasians, and 45% hypertensive. Unadjusted analysis showed an average lower BMD in hypertension participants by 6.23 mg/cc ($p < 0.001$). In multivariable modeling, no linear association was found ($p = 0.687$). Normal BMD prevalence was 29% in those with HTN versus 32% in those without. Osteoporosis prevalence was 30% in those with HTN versus 23% in those without. Categorized BMD showed a significant association with HTN in unadjusted analysis (OR 1.27 with 95% CI 1.61-1.39, $p < 0.001$), but after adjusting for multiple factors, HTN wasn't significantly associated with categorized BMD (OR 0.96 with 95% CI 0.86 -1.07).

Conclusion:

The study's results suggest that HTN is not independently associated with BMD.