007. Wide Pulse Pressure Associated with Low Bone Mineral Density among Adult USA Population: Analysis of the National Health and Nutritional Examination Survey
Thursday, October 5, 2017

IM McFarlane, M Rodriguez Alvarez, S Zhaz Leon, DJ Ozeri, C Saladini-Aponte, T Ho Shin, Y Saperstein, M Bhamra, L Freeman, N Ojike
Department of Medicine, State University of New York, Downstate Medical Center, Brooklyn, NY.

Purpose

Accumulating evidence indicates an association between osteoporosis and cardiovascular disease (CVD) above and beyond advanced age and estrogen deficiency. Hypertension, a known risk factor for CVD is also associated with low bone mineral density (BMD) in both men and women likely related to increased urinary calcium excretion. Brachial-ankle pulse wave velocity is significantly associated with low BMD. In the Rotterdam study and other prospective studies, low BMD was associated with peripheral arterial disease and an age-independent progressive atherosclerosis. In the Multi-Ethnic Study of Atherosclerosis (MESA), low BMD was associated with greater coronary artery calcification as well as increased aortic calcification.

We hypothesize that wide pulse pressure (PP), a strong indicator of CVD risk, will be independently associated with low BMD.

Methods

The study used data from two (2) consecutive cycles of NHANES US national health data from 2009-2010 and 2011-2012. NHANES is a complex, multistage, area probability sample representative of the US non-institutionalized civilian population. Point estimates of demographic variables were calculated using descriptive method. Study participants were divided into 4 groups based on quartile distribution of PP. Multivariate linear regression analysis was performed to assess the relationship between BMD and PP.

Results

A total of 8,179 NHANES participants were included in the study. They were 55.2% female. For the entire cohort the mean age (±SEM) 53.3 years ± 0.19, mean BMI (±SEM) 29.6 kg/m2 ± 0.07, and mean PP (mmHg) = 57.2 ± 0.12 and was significantly higher with increased age, among Blacks (58.7 ± 0.18) and Hispanics (57.5± 0.19) compared to Whites (53.6 ± 0.16), and for men (57.2± 0.16) when compared to women (54.1± 0.17), p<0.05. BMD (g/cm2) at the lumbar spine was 1.064 ± 0.0026 for men, and 1.00 ± 0.0023 for women. At the femoral neck, BMD was 0.86 ± 0.0026 for men and 0.79 ± 0.0023 for women. After adjusting for age, sex, race, menopause, body mass index, and family history of osteoporosis, PP was associated with femoral neck BMD, β= - 0.0005, p <0.05 but was not significantly associated with lumbar spine BMD, β= - 0.0002, p =0.07

Conclusions

Our study indicates a negative association between PP and BMD at the femoral neck (high cortical bone content; indicator of senile osteoporosis). This association was not shown at the lumbar spine (high trabecular bone; indicator of postmenopausal osteoporosis). These findings were demonstrated after

adjusting for major risk factors for atherosclerosis and osteoporosis; thus, indicating an independent association between wide PP and low BMD. Our data have the potential for using PP, a readily available clinical measurement to identify patients at risk of low BMD and osteoporosis that is affecting our aging population leading to increased fractures, disability and overall mortality.