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Sarwary, Shabir, "Association between Abdominal Aortic Calcification Severity and Depressive Symptoms: Cross-Sectional study findings from NHANES 2013-2014" (2022). *OHSU-PSU School of Public Health Annual Conference*. 10.
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Association between Abdominal Aortic Calcification Severity and Depressive Symptoms: Cross-Sectional study findings from NHANES 2013-2014

Shabir Sarwary, MPH

BACKGROUND

Abdominal aortic calcification (AAC) is an asymptomatic condition in which calcium deposits build up in abdominal aorta. AAC is detectable only by imaging. When present, severe AAC increases the risk of developing major coronary heart disease compared to no or minimal AAC. Depression affects nearly 10% of U.S. adults and is often present among those who have experienced a major coronary heart disease event, such as myocardial infarction. It is unknown if the prevalence of depression is elevated in adults who have severe AAC. Therefore, we hypothesize that the prevalence of depressive symptoms will be higher among adults severe AAC compared with those with no or minimal AAC.

METHODS

We used the 2013-2014 cycle of National Health and Nutrition Examination Survey (NHANES) to examine the cross-sectional association between AAC severity and depressive symptoms on adults ≥ 40 years. Lateral spine images were obtained with dual energy X-ray absorptiometry (DXA). We assessed severity of AAC as a categorical variable with three levels, none (0), mild AAC (1-5), and moderate/severe AAC (6-24). Depressive symptoms were obtained from the PHQ-9 questionnaire. We categorized depression as none or mild (0-4), or moderate to severe (5-27). We performed logistic regression models to obtain odds ratios (OR) along with their 95% CI. To assess potential confounding factors, we controlled for age, and smoking We also used stratified analysis to estimate OR among each sex and age group.

RESULTS

In categories of no, mild and moderate/severe AAC, the prevalence of depressive symptoms respectively, were 24%, 21%, and 23%. In the fully adjusted model, the odds of depressive symptoms among those with moderate to severe AAC was 0.74 times the odds of depressive symptoms among those without AAC (OR=0.74, 95% CI: 0.51,1.09). Similarly, the odds of depressive symptoms among those with mild AAC was 0.77 times the odds of depressive symptoms among those without AAC (0.77 (0.55, 1.06). When stratified by sex, the fully adjusted OR among both sexes were consistent with inverse association between AAC severity and depressive symptoms.

DISCUSSION

In this nationally representative sample of US adults ages 40 years or older, AAC severity and depressive symptom prevalence were not positively associated. Our results are consistent with a null or possibly a weak inverse association between AAC severity and prevalence of depressive symptoms. Despite plausible mechanisms by which AAC could contribute to depression, such as disruption of blood flow to the brain, deterioration of blood coagulation, and inflammation, our results do not support a link between the two conditions. Future studies should focus on temporality when examining the association of AAC severity on depressive symptoms, as we had limited medical history for our analytic sample and could not make any causal inference due to the cross-sectional study design.

Keywords
Abdominal Aortic Calcification; AAC; Depression; Cardiovascular Disease biomarker; Depression biomarker; NHANES; Chronic Disease Epidemiology