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Alanine Aminotransferase in Emerging Black Individuals: A Potential Biomarker for Early Aging?

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INTRODUCTION: Chronic psychological stress continues to emerge as contributor to racial health disparities. Black women in particular experience an accelerated pattern of aging, driven partly by perceived stress. Low levels of serum alanine aminotransferase (ALT) are reportedly associated with age-related frailty, sarcopenia, and all-cause mortality, conditions typically correlated with lower bone mineral density (BMD). Conversely, elevated ALT is also associated with decreased BMD as well as vascular dysfunction in the context of liver pathologies such as nonalcoholic fatty liver disease. **PURPOSE:** To assess the relationships between perceived stress, ALT, BMD, and vascular function in emerging Black individuals. **METHODS:** A total of 86 participants (male=34, female=52) completed the Perceived Stress Scale (PSS), blood serum analysis by Quest diagnostics, DEXA scan, and brachial-artery flow-mediated dilation (%FMD) during the same visit. **RESULTS:** PSS scores were inversely correlated with ALT ($r = -0.273$, $p = 0.048$) only in women. However, PSS scores in both men and women inversely correlated with BMD (men: $r = -0.474$, $p = 0.005$; women: $r = -0.271$, $p = 0.05$). ALT negatively correlated with %FMD in men but not in women ($r = -0.515$, $p = 0.003$). ALT was weakly predictive of %FMD in men ($R = 0.370$; $R^2 = 0.137$, $p = 0.041$). **CONCLUSION:** Recent studies report low levels of ALT to be associated with an increased prevalence of cardiovascular mortality, frailty, and sarcopenia. In Black emerging women, decreased serum ALT and BMD may be related to perceived stress. Conversely, the inverse relationship between ALT and %FMD observed in emerging Black men may present novel sex differences when considering the risks of liver and vascular dysfunction in response to stress. The collective decline in BMD associated with greater perceived stress in both men and women could support evidence of the weathering hypothesis in primary adulthood. **SCIENTIFIC NOVELTY:** ALT may prove a useful biomarker when assessing premature physiological decline in Black individuals given the context of weathering. Evaluating these relationships in an older population is critical to further elucidate whether age-related pathological trends are impacted by perceived stress, and if the observed sex differences persist into mid and later adulthood.

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