TACSM Abstract

The Transient Influence of Acute Bouts of Aerobic Exercise on Vitamin-D Concentrations in Moderate Stages of Chronic Kidney Disease

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ABSTRACT

Chronic kidney disease (CKD) is a gradual loss of renal filtration and has been shown to be associated with lower levels of vitamin D (Vit-D). Vit-D is highly synthesized in the kidneys and is linked to multiple health conditions. Aerobic exercise of differing intensity and modality has shown potential in acutely improving Vit-D concentration in healthy and diseased populations. **Purpose:** To determine the influence of acute bouts of high-intensity interval exercise (HIIE) and steady-state exercise (SSE) on Vit-D concentrations in individuals with moderate stages of CKD. **Methods:** A total of 13 participants (n = 7 women; n = 6 men; age 58.5 ± 10.1 yr.; eGFR 56.9 ± 18.9 mL/min/1.73m^2; BMI 28.7 ± 4.5) underwent a standard screening session which included VO_2max, DEXA, blood, and urine samples. All participants then completed both acute HIIE and SSE sessions consisting of 3-time points (pre, 1-hr, and 24-hr) separated by a washout period of 3 days. Serum creatinine and cystatin C were obtained to determine CKD stage via estimated glomerular filtration rate (eGFR) and overall renal filtration. Plasma Vit-D, urine epidermal growth factor (uEGF), serum and urine creatinine, and cystatin C concentrations were obtained at all time points. The data was analyzed using a 2 (condition) x 3 (time point) ANOVA and t-tests to determine the difference in Vit-D concentrations. A Pearson Correlation was performed to determine Vit-D association with renal health and filtration. All analyses were performed using SPSS (v. 28.0.1.1). **Results:** Plasma Vit-D concentrations did not significantly change across exercise conditions or time points (F = 1.13, p = 0.34). Additionally, there were no significant associations between Vit-D and biomarkers of renal filtration and health (r = - 0.475, p = 0.10). **Conclusions:** Though Vit-D has been observed to increase with aerobic exercise of varying intensities in healthy populations. There was no significant change observed in HIIE or SSE conditions spanning 24 hours in moderate stages of CKD. Indicating a disruption of the Vit-D synthesis pathway, potentially attributed to the decline of healthy renal tissue and function. These outcomes thereby elicit a need for further research in this growing area of interest focused on exercise, Vit-D, and CKD.