White blood cell counts mediate the effect of physical activity on prostate-specific antigen levels.

Loprinzi PD, Richart SM.

Abstract

The purpose of this study was to examine whether white blood cell (WBC) level mediated the relationship between physical activity and prostate-specific antigen (PSA) levels.

Method: Data from the 2003-2006 National Health and Nutrition Examination Survey were used; 1,726 U.S. adult men (aged 40 years or older) provided complete data on the study variables. Participants wore an ActiGraph 7164 accelerometer for a 7-day period to measure their physical activity behavior, and PSA and WBC levels were obtained from a blood sample.

Results: After adjustments, results showed that moderate-to-vigorous physical activity (MVPA) was inversely associated with WBC count (b = - .03; 95% CI [ - 0.04, - 0.006; p = .01), and WBC count (b = .10; 95% CI [0.009, 0.18; p = .04) was positively associated with PSA. Both the Sobel (coef. = - .004, SE = .002; z = - 2.0; p = .03) and the Aroian (coef. = - .004, SE = .002; z = - 1.9; p = .03) tests demonstrated that WBC mediated the relationship between physical activity and PSA. Additionally, among 107 participants with prostate cancer, survivors engaging in more MVPA had lower levels of WBC (b = - .04; 95% CI [ - 0.09, - 0.0009; p = .04). Conclusion Physical activity may influence PSA levels through WBC modulation; however, future research is needed to determine the direction of causality. Additionally, prostate cancer survivors engaging in higher levels of MVPA had lower levels of WBC, underscoring the importance of promoting physical activity among prostate cancer survivors.

Keywords: National Health and Nutrition Examination Survey (NHANES); accelerometry; epidemiology; physiology

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