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Is it Possible to Determine Cardiorespiratory Fitness in Breast Cancer Survivors without Exercising?

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Description

Over the last few decades, advances in screening and therapy have resulted in an increase in the number of breast cancer survivors. Breast cancer survivors are at a higher long-term risk for cardiovascular disease, in part due to shared risk factors and potential severe cardiac and vascular consequences of cancer therapy. Despite greater attention and better knowledge of the factors that support breast cancer survivors' elevated CVD risk, risk classification remains difficult. Impaired cardiorespiratory fitness has lately emerged as a potent predictor of all-cause and cardiovascular mortality in cancer survivors and it may help identify patients who might benefit from therapies like cardio-oncology rehabilitation or augmented screening.

Although CRF can be calculated using relatively simple tests like exercise tolerance tests or 6-minute walk tests, they do not directly account for volitional effort, can have training effects with repeated testing, and cannot distinguish cardiovascular from pulmonary or musculoskeletal limitations to exercise. Cardiopulmonary Exercise Testing (CPET) is the "gold standard" for determining CRF by measuring gas exchange directly. It can assure proper volitional effort and offer additional physiological measurements of cardiovascular and pulmonary performance during exercise. Reduced peak Vo_2 is linked to lower quality of life and increased mortality in breast cancer survivors, emphasizing its clinical utility and the need of identifying its physiological drivers and possible modifiability.

Identifying breast cancer survivors with impaired CRF is an important first step toward understanding its broad implications in caring for this growing population, but pursuing CPET for peak Vo_2 assessment is not feasible for all patients due to the specialized equipment and expertise required to conduct and interpret these tests. Researchers investigates whether more readily available clinical information, a combination of clinical, echocardiographic, and biomarker measures-can reveal lower peak Vo_2 in women following breast cancer treatment in this issue. There are some patients with $HER2^+$ breast cancer in stages I to III who had been treated with anthracycline chemotherapy and trastuzumab. Between 4 and 8 weeks after finishing trastuzumab, subjects were clinically evaluated, biomarkers were taken, and transthoracic echocardiography and CPET were performed.

Despite these potentially significant clinical consequences, numerous more stages must be completed before these discoveries can be applied to clinical practice. Because this study was conducted on a single cohort from a single university hospital system, the findings must be confirmed in other cohorts with varied demographic and racial/ethnic makeups. Although resting echocardiogram may be more accessible to many patients than exercise testing, high-quality strain imaging data is not routinely available clinically, and strain imaging measurements are known to vary between centers and vendors, making single cut-off values difficult to use.

Although peak CRF is known to be strongly associated with health outcomes, the ability of a multivariable model estimate of peak Vo_2 to predict future CVD outcomes in breast cancer survivors definitely warrants further investigation. Finally, while the investigators' decision to focus on an 18 mL O_2/kg/min peak Vo_2 threshold is understandable given the lack of consensus on age-specific cut off values for functional independence, the relationship between peak Vo_2 and CVD outcomes is linear, and a single threshold is unlikely to adequately describe very different clinical implications across age groups and according to pre-treatment functional capacity.

The researchers fill a critical gap in the field of identifying early markers of reduced CRF in breast cancer survivors. Clinical validation, including in external cohorts with a larger racial and ethnic diversity, as well as determining whether and how deficient CRF may be corrected in breast cancer survivors, will require further implementation. They take a crucial step forward in moving from passive monitoring of compromised CRF in cancer survivors to early, active, focused care for this at-risk.